

**Integrating the Healthcare Enterprise**



5

**IHE Laboratory (LAB)  
Technical Framework**

**Volume 2a**

**LAB TF-2a**

10

**Transactions Part A**

15

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## 1 Introduction

### 1.1 Overview of IHE

140 Integrating the Healthcare Enterprise (IHE) is an initiative designed to stimulate the integration  
of the information systems that support modern healthcare institutions. Its fundamental objective  
is to ensure that in the care of patients all required information for medical decisions is both  
correct and available to healthcare professionals. The IHE initiative is both a process and a forum  
for encouraging integration efforts. It defines a technical framework for the implementation of  
145 established interoperability standards to achieve specific clinical goals. It includes a rigorous  
testing process for the implementation of this framework, organizes educational sessions,  
exhibits at major meetings of medical professionals to demonstrate the benefits of this  
framework and encourage its adoption by industry and users.

The approach employed in the IHE initiative is to support the use of existing standards, e.g.,  
150 HL7, ASTM, DICOM, ISO, IETF, OASIS, CLSI and others as appropriate, rather than to define  
new standards. IHE profiles further constrain configuration choices where necessary in these  
standards to ensure that they can be used in their respective domains in an integrated manner  
between different actors. When clarifications or extensions to existing standards are necessary,  
IHE refers recommendations to the relevant standards bodies.

### 1.2 Overview of the Laboratory Technical Framework

#### 1.2.1 Production

This document, the Laboratory Technical Framework (LAB TF), defines specific  
implementations of established standards to achieve integration goals of clinical laboratories  
with other components of a healthcare enterprise or with a broader community of healthcare  
160 providers, hereafter called a healthcare community.

This document is updated annually, following a period of public review, and maintained  
regularly through the identification and correction of errata. The current version, rev. 5.0 Final  
Text, specifies the IHE transactions defined and implemented as of November 2013. The latest  
version of the document is always available via the Internet at  
165 [http://ihe.net/Technical\\_Frameworks](http://ihe.net/Technical_Frameworks).

It has been produced with the help of the following organizations:

- CAP (College of American Pathologists)
- ASIP Santé (Agence des Systèmes d'Information Partagés de Santé) formerly GMSIH  
(Groupement pour la Modernisation du Système d'Information Hospitalier)
- 170 • JAHIS (Japanese Association of Healthcare Information Systems Industry)
- IHE-J (IHE Japan)
- SFIL (Société Française d'Informatique de Laboratoire)
- HL7 and its affiliate organizations

- RSNA (Radiological Society of North America)

## 175 **1.2.2 How the Laboratory Technical Framework is organized**

The IHE Laboratory Technical Framework identifies a subset of the functional components of the healthcare enterprise or healthcare community, called IHE actors, and specifies their interactions in terms of a set of coordinated, standards-based transactions. It describes this body of transactions in progressively greater depth, and is organized in volumes:

- 180 • **Volume 1** of the Laboratory Technical Framework (LAB TF-1) provides a high-level view of IHE functionality, showing the transactions organized into functional units called integration profiles that highlight their capacity to address specific integration requirements for clinical purposes.
- 185 • **Volumes 2a, 2b, and 2x** of the Laboratory Technical Framework (LAB TF-2a, Lab TF-2b, LAB TF-2x) provide a detailed technical description of each message-based transaction and of its messages.
- **Volume 3** of the Laboratory Technical Framework (LAB TF-3) provides a detailed technical description of each document-based transaction, its persistent content and binding.
- 190 • **Volume 4** of the Laboratory Technical Framework (LAB TF-4) has been deprecated

## **1.3 Audience**

The intended audience of this document is:

- Technical staff of vendors participating in the IHE initiative
- IT managers of healthcare institutions and healthcare communities
- 195 • Experts involved in standards development
- Anyone interested in the technical aspects of integrating healthcare information systems

## **1.4 Relationship to Standards**

200 The IHE Laboratory Technical Framework identifies functional components of a distributed healthcare environment (referred to as IHE actors), solely from the point of view of their interactions in the healthcare enterprise. At its current level of development, it defines a coordinated set of transactions based on HL7, IETF, ISO, CLSI, OASIS and W3C standards. As the scope of the IHE initiative expands, transactions based on other international standards may be included as required.

205 In some cases, IHE recommends selection of specific options supported by these standards; however, IHE does not introduce technical choices that contradict conformance to these standards. If errors in or extensions to existing standards are identified, IHE's policy is to report them to the appropriate standards bodies for resolution within their conformance and standards evolution strategy.

210 IHE is therefore an implementation framework, not a standard. Conformance claims for products must still be made in direct reference to specific standards. In addition, vendors who have

implemented IHE integration capabilities in their products may publish IHE Integration Statements to communicate their products' capabilities. Vendors publishing IHE Integration Statements accept full responsibility for their content. By comparing the IHE Integration Statements from different products, a user familiar with the IHE concepts of actors and integration profiles can determine the level of integration between them.

## 1.5 Relationship to Real-world architectures

The IHE Actors and transactions are abstractions of the real-world healthcare information system environment. While some of the transactions are traditionally performed by specific product categories (e.g., Hospital Information System, Electronic Patient Record, Clinical Information System, Laboratory Information System, Laboratory Automation System, analyzer, robotic transportation system and other pre and post-analytic process equipment), the IHE Laboratory Technical Framework intentionally avoids associating functions or actors with such product categories. For each actor, the IHE Laboratory Technical Framework defines only those functions associated with integrating information systems. The IHE definition of an actor should therefore not be taken as the complete definition of any product that might implement it, nor should the framework itself be taken to comprehensively describe the architecture of a healthcare information system.

## 1.6 History of Annual Changes

The IHE Technical Framework is updated annually to reflect new profiles, corrections and new transactions.

### 1.6.1 Scope of Changes Introduced in the Current Year (2013)

This revision 5.0 incorporates a single minor correction from Change Proposal #193. It will be the basis for 2014 Connectathons.

### 1.6.2 Scope of Changes Introduced in Year 2012

This revision 4.0 incorporates a number of Change Proposals resulting from the Connectathons of years 2011 – 2012. It will be the basis for 2013 Connectathons.

### 1.6.3 Scope of Changes Introduced in Year 2011

This revision 3.0 incorporates a number of Change Proposals resulting from the Connectathons of years 2008 – 2010. It will be the basis for Connectathons 2011 (in Europe, Japan and other regions) and 2012 (in North-America).

The major enhancements are:

- Batch option and various refinements added to transaction LAB-51 (LCSD profile)
- Fixes and refinements on some field definitions in various transactions.

### 1.6.4 Scope of Changes Introduced in Year 2008

The main changes introduced by revision 2.1 were the following:

- Refined descriptions of segments ORC, SAC, TQ1, OBX, SPM (see sections 3.5 to 3.9)

- Microbiology reporting rules (see section 3.11 and example in section 19.5)
- Option “Report Facsimile For Order Group” (see sections 4, 6 and example in section 19.4)
- 250 • HL7 Ack, and MSA, ERR segments descriptions externalized to ITI TF-2:Appendix C
- Support of HL7 v2.5.1 (see OBX segment description in section 3.9)
- Cleanup of all examples messages in section 19

## 1.7 Comments

255 IHE International welcomes comments on this document and the IHE initiative. They should be directed to the co-chairs of the IHE Laboratory Committee, using the address [lab@ihe.net](mailto:lab@ihe.net).

## 1.8 Copyright Permissions

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260 IHE grants permission to Health Level Seven Inc. and its affiliate organizations to reproduce either parts of this document or the document in its entirety.

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265 IHE grants permission to CLSI to reproduce either parts of this document or the document in its entirety.

## 1.9 IHE Technical Framework Development and Maintenance Process

270 The IHE Laboratory Technical Framework is being continuously extended and maintained by the IHE Laboratory Technical committee. The development and maintenance process of the Framework follows a number of principles to ensure stability of the specification so that both vendors and users may use it reliably in specifying, developing and acquiring systems with IHE integration capabilities.

275 The first of these principles is that any extensions, clarifications and corrections to the Technical Framework must maintain backward compatibility with previous versions of the framework in order to maintain interoperability with systems that have implemented IHE Actors and Integration Profiles defined there.

## 1.10 Glossary

See Glossary section in Volume 1: LAB TF-1:1.11



## 280 2 Conventions

### 2.1 Technical Framework Cross-references

When references are made to another section within a Technical Framework volume, a section number is used by itself. When references are made to other volumes or to a Technical Framework in another domain, the following format is used:

285 <domain designator> TF-<volume number>: <section number>, where  
<domain designator> is a short designator for the IHE domain (ITI = IT Infrastructure, PCC = Patient Care Coordination, LAB = Laboratory)  
<volume number> is the applicable volume within the given Technical Framework (e.g., 1, 2, 3),  
<section number> is the applicable section number.

290 For example: ITI TF-1: 3.1 refers to Section 3.1 in volume 1 of the IHE IT Infrastructure.

When references are made to Transaction numbers in the Technical Framework, the following format is used:

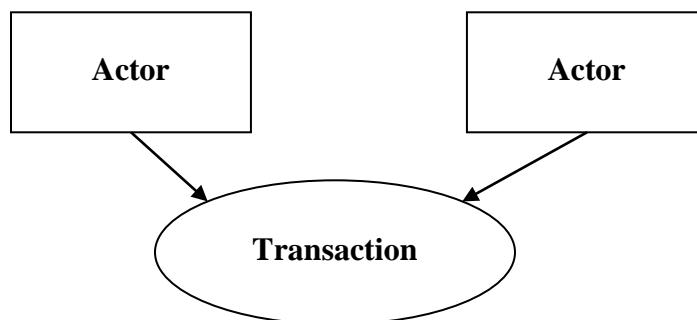
[<domain designator>-<transaction number>], where  
<transaction number> is the transaction number within the specified domain. For example:  
295 [LAB-1] refers to Transaction 1 from the IHE Laboratory Technical Framework, [ITI-30] refers to Transaction 30 from the IT Infrastructure Technical Framework.

### 2.2 The generic IHE Transaction Model

300 Transaction descriptions are provided in Section 3. In each transaction description, the actors, the roles they play, and the transactions between them are presented as use cases.

The generic IHE transaction description includes the following components:

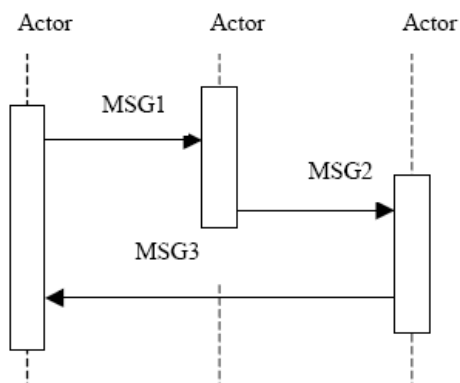
- Scope: a brief description of the transaction.
- Use case roles: textual definitions of the actors and their roles, with a simple diagram relating them, e.g.,:



305

- *Referenced Standards*: the standards (stating the specific parts, chapters or sections thereof) to be used for the transaction.
- *Interaction Diagram*: a graphical depiction of the actors and messages that support the transaction, with related processing within an Actor shown as a rectangle and time progressing downward, similar to:

310



The interaction diagrams used in the IHE Laboratory Technical Framework are modeled after those described in Grady Booch, James Rumbaugh, and Ivar Jacobson, *The Unified Modeling Language User Guide*, ISBN 0-201-57168-4. Simple acknowledgment messages are often omitted from the diagrams for brevity. One or more messages may be required to satisfy a transaction. Each message is represented as an arrow starting from the Actor initiating the message.

315

- *Message definitions*: descriptions of each message involved in the transaction, the events that trigger the message, its semantics, and the actions that the message triggers in the receiver.

320

## 2.3 HL7 Profiling Conventions

The messages used by each transaction are described in this document using static definitions of "HL7 constrainable message profiles". Refer to HL7 v2.5 section 2.12.6. The static definition of each message is represented within tables. At the message level, a table represents the message structure and its definition in terms of segments. At the segment level, a table details one segment and its definition in terms of fields.

325

### 2.3.1 Static Definition - Message Level

The table describing a message contains 5 columns:

- *Segment*: gives the segment name, and places the segment within the hierarchy of the HL7 message structure. Segments or segment groups not required appear between square brackets. Repeatable segments or segment groups appear between braces.
- *Meaning*: Meaning of the segment as defined by HL7
- *Usage*: Coded usage of the segment, as defined by this static definition built for the context of this particular transaction within IHE Laboratory Technical Framework. The coded values used in this document are:

330

335

340 **R:** Required: A compliant sending application shall populate all "R" elements with a non-empty value. A compliant receiving application shall process (save/print/archive/etc.) or ignore the information conveyed by required elements. A compliant receiving application shall not raise an error due to the presence of a required element, but may raise an error due to the absence of a required element.

345 **RE:** Required if available. The element may be missing from the message, but shall be sent by the sending application if there is relevant data. A conformant sending application shall be capable of providing all "RE" elements. If the conformant sending application knows the required values for the element, then it shall send that element. If the conformant sending application does not know the required values, then that element may be omitted.  
Receiving applications will be expected to process (save/print/archive/etc.) or ignore data contained in the element, but shall be able to successfully process the message if the element is omitted (no error message should be generated if the element is missing).

350 **O:** Optional. The usage for this field within IHE Laboratory Technical Framework has not been defined yet

**C:** Conditional. This usage has an associated condition predicate. (See HL7 v2.5 section 2.12.6.6 "Condition Predicate").

355 If the predicate is satisfied: A compliant sending application shall always send the element. A compliant receiving application shall process or ignore data in the element. It may raise an error if the element is not present.

360 If the predicate is NOT satisfied: A compliant sending application shall NOT send the element. A compliant receiving application shall NOT raise an error if the condition predicate is false and the element is not present, though it may raise an error if the element IS present.

**X:** Not supported. For conformant sending applications, the element will not be sent. Conformant receiving applications may ignore the element if it is sent, or may raise an application error.

- 365
- Cardinality: Within square brackets, minimum and maximum number of occurrences authorized for this segment, in this static definition of the message, built for the context of this particular transaction within IHE Laboratory Technical Framework.
  - HL7 chapter: Reference of the HL7 v2.5 chapter that describes this segment.

**Simplification:**

For a better readability of the table, the usage "X" is not shown at the message level: if a segment is "not supported" by an IHE profile, it simply doesn't appear in the table representing the message structure.

370

**Table 2.3.1-1: Example - Initial segments of a message description**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
[	--- PATIENT VISIT begin	RE	[0..1]	
PV1	Patient Visit	R	[1..1]	3

### 2.3.2 Static Definition - Segment Level

The table describing a segment and its definition in terms of fields contains 7 columns:

- 375 • **SEQ:** Position (sequence) of the field within the segment.
- **LEN:** Maximum length of the field
- **DT:** Field Data Type
- **Usage:** Usage of the field in this particular context of IHE Laboratory Technical Framework. Same coded values as in the message level: R, RE, C, O, X
- 380 • **Cardinality:** Minimum and maximum number of occurrences for the field in this particular context of IHE Laboratory Technical Framework. Same meaning as in the message level.
- **TBL#:** Table reference (for fields using a set of defined values)
- **ITEM#:** HL7 unique reference for this field
- 385 • **Element Name:** Name of the field.

#### Simplification :

For a better readability of the table, the usage "O" is not shown at the segment level:  
Optional fields do not appear in the tables. The number in the first column SEQ is the only item of information that provides the exact position of a field within this segment.

- 

**Table 2.3.2-1: Example - The MSH segment description**

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM#	Element name
1	1	ST	R	[1..1]		00001	Field Separator
2	4	ST	R	[1..1]		00002	Encoding characters
3	227	HD	R	[1..1]	0361	00003	Sending Application
...							

## 2.4 HL7 Implementation Notes

### 390 2.4.1 Network Guidelines

The IHE Laboratory Technical Framework makes these recommendations:

Applications shall use the Minimal Lower Layer Protocol (MLLP) defined in appendix C of the HL7 Implementation Guide.

395 An application that wants to send a message (initiate a transaction) will initiate a network connection (if one does not already exist) to start the transaction. The receiver application will respond with an acknowledgement or response to query but will not initiate new transactions on this network connection.

### 2.4.2 Message Granularity

400 A message is generated from one trigger event in the real world. Therefore a message is related to one single business object:

- A LAB-1, LAB-2 or LAB3 message is related to one Order or to one Order Group.
- A LAB-4 or LAB-5 message is related to one Work Order.
- A LAB-21, LAB-22, LAB-23 or LAB-26 message is related to one Work Order Step.

### 2.4.3 Empty and Nullified Fields

405 According to HL7 standard, if the value of a field is not present, the receiver shall not change corresponding data in its database. However, if the sender defines the field value to be the explicit NULL value (i.e., two double quotes ""), it shall cause removal of any values for that field in the receiver's database. This convention is fully applied by the IHE Laboratory Technical Framework.

### 410 2.4.4 Acknowledgement Modes

The Laboratory Technical Framework applies thoroughly the acknowledgement rules and syntax as defined in <b>ITI TF-2: C.2.3</b> . Implementers are referred to this <b>section C.2.3 in Appendix C of ITI TF volume 2</b> for all details regarding the usage of the MSA segment in acknowledgement messages (that is ACK, ORL and RSP messages), as well as the usage of the ERR segment.
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

415 For the IHE Laboratory Technical Framework, applications that receive HL7 messages shall send acknowledgements using the HL7 original acknowledgement mode as defined in HL7 v2.5 chapter 2, 2.9.2. The enhanced acknowledgement rules are not supported.

420 An OML message shall be acknowledged by one single ORL message. An OUL or an ORU message shall be acknowledged by one single ACK message. These acknowledgements are application-level acknowledgements (i.e., not transport acknowledgements) and must be generated by the receiving application after it has parsed the message and processed its content.

The receiving application shall automatically generate the application-level acknowledgement messages without waiting for human approval of the contents of the message that was received.

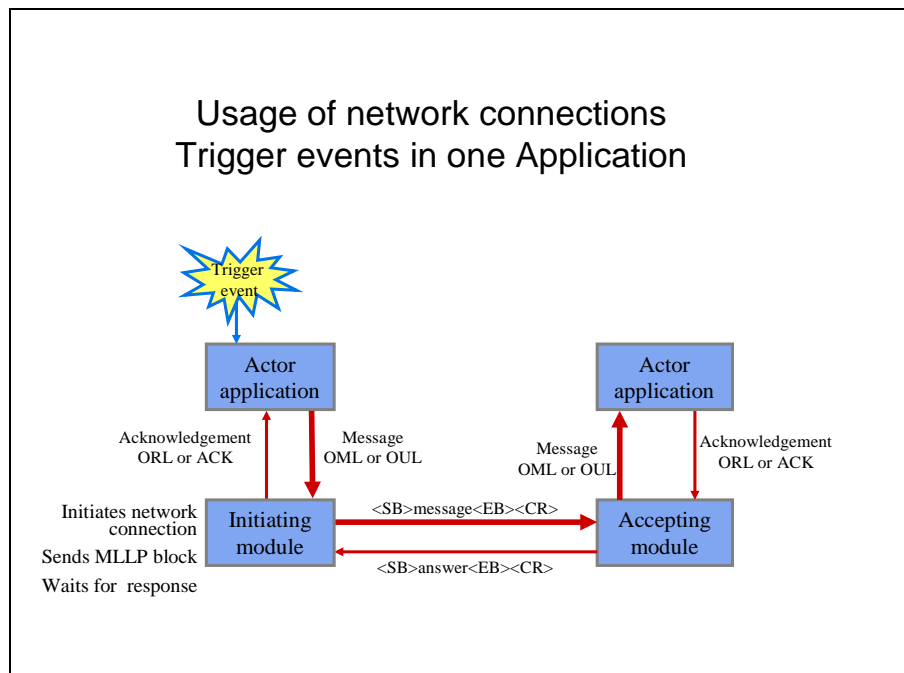
### 2.4.5 IHE Laboratory Technical Framework Acknowledgement Policies

425 From a transactional viewpoint a MLLP (Minimal Lower Layer Protocol) network connection is *unidirectional*. Event-triggered messages flow in one direction and acknowledgement messages related to those event-triggered messages flow in the other direction.

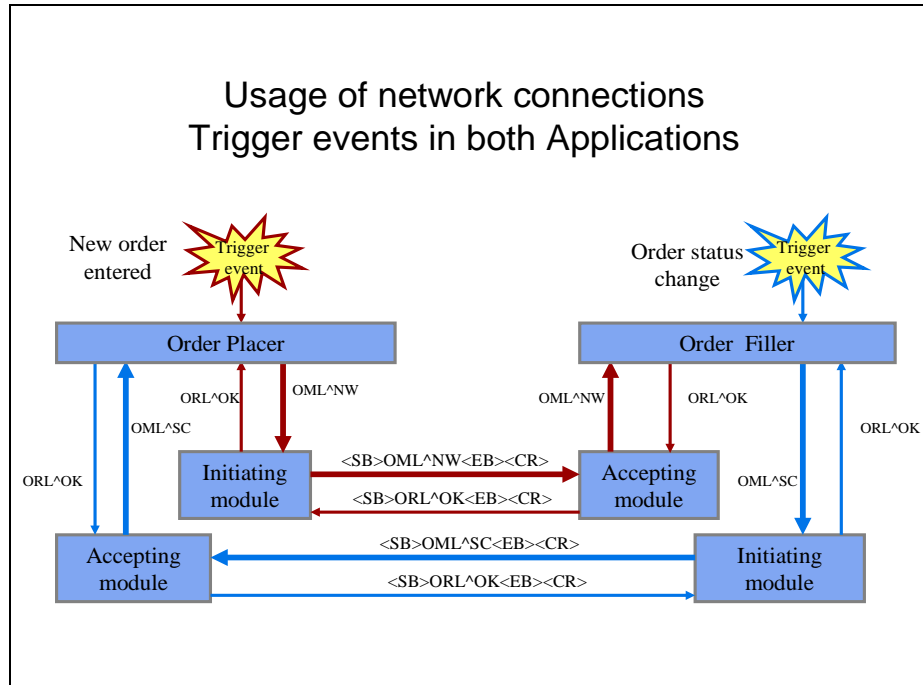
430 The acknowledgement message to an event-triggered message shall be sent *immediately* to the sender on the same MLLP connection that carried the event-triggered message. The receiver of an event-triggered message should assume that the sending application is blocking and send an application-level acknowledgement as soon as possible.

435 It may take the receiving system a while (seconds, minutes) to acknowledge a message. If the MLLP connection is broken whilst the sending application is still waiting for an acknowledgement, the sending application shall initiate a new MLLP connection and resend the message.

440 The acknowledgement message is an application-level acknowledgement. (Note: HL7 commit/accept acknowledgement messages shall not be used). The application acknowledgement shall only be created by an application that is able to examine a message at the semantic / business-process level. Intermediate message brokers do not have this capacity and therefore shall not be used to generate the contents of application acknowledgements.



445 Transactions between 2 applications which contain trigger events on both sides (such as LAB-1) require at least two network connections between the Actors, one for each direction:



450

### 2.4.6 HL7 Data Types

This section describes the IHE constraints on some HL7 data types.

#### 2.4.6.1 CX – Extended Composite ID with Check Digit

The constraints below particularly apply to the Patient Identifiers (PID segment).

455

SEQ	LEN	DT	Usage	CARD	TBL#	COMPONENT NAME
1	15	ST	R	[1..1]		ID Number
2	1	ST	O	[0..1]		Check Digit
3	3	ID	O	[0..1]	0061	Check Digit Scheme
4	227	HD	R	[1..1]	0363	Assigning Authority
5	5	ID	RE	[0..1]	0203	Identifier Type Code
6	227	HD	O	[0..1]		Assigning Facility
7	8	DT	O	[0..1]		Effective Date
8	8	DT	O	[0..1]		Expiration Date
9	705	CWE	O	[0..1]		Assigning Jurisdiction
10	705	CWE	O	[0..1]		Assigning Agency or Department

The data type has been constrained because the IHE Framework regards the Assigning Authority and the Identifier Type Code as essential components.

### 2.4.6.2 EI – Entity Identifier

460 The constraints below particularly apply to the following fields: placer order number, filler order number and specimen number.

SEQ	LEN	DT	Usage	CARD	TBL#	COMPONENT NAME
1	16	ST	R	[1..1]		Entity Identifier
2	20	IS	C	[0..1]	0363	Namespace ID
3	199	ST	C	[0..1]		Universal ID
4	6	ID	C	[0..1]	0301	Universal ID Type

Component 1 is required. Either component 2 or both components 3 and 4 are required. Components 2, 3 and 4 may be all present.

465 The EI is appropriate for machine or software generated identifiers. The generated identifier goes in the first component. The remaining components, 2 through 4, are known as the assigning authority; they can also identify the machine/system responsible for generating the identifier in component 1.

Example 1: AB12345^RiversideHospital

470 Example 2: AB12345^^1.2.840.45.67^ISO

Example 3: AB12345^RiversideHospital^1.2.840.45.67^ISO

IHE restrains the length of the first component to 16 characters. National extensions can extend this length up to a maximum of 199.

475 IHE recommends to fill component 2 “Namespace ID” in all cases. Particularly when there are several concurrent assigning authorities within the healthcare enterprise, this Namespace ID will indicate which assigning authority provided this number.

This happens for instance, when there are several Order Placer actors within the enterprise, each one assigning placer order numbers and placer group numbers.

480 Example 4: Placer order number and placer group number assigned by two different Order Placer actors.

In message 1: ORC|NW|9876543^Nephro||777^Nephro|...

In message 2: ORC|SC|9876543^Urology||555^Urology|...

This also commonly happens when there are several Order Filler actors within the enterprise, each one assigning its own filler order numbers and specimen numbers.

485 Example 6: Filler order number and specimen number assigned by the Order Filler actor operated by the clinical laboratory of cytology.

SPM|1|^45611&Cytology|...

...

OBR|1|^456^Cytology|...



490 **2.4.6.3 EIP – Entity Identifier Pair****HL7 Component Table - EIP – Entity Identifier Pair**

SEQ	LEN	DT	Usage	CARD	TBL #	COMPONENT NAME
1	427	EI	C	[0..1]		Placer Assigned Identifier
2	427	EI	C	[0..1]		Filler Assigned Identifier

495 The IHE LAB-TF uses this data type for identifying specimens (see SPM-2 and SPM-3 in SPM segment static definition) and Order Groups (see ORC-4 in ORC segment static definition).

Condition predicate for specimens:

- 500 • In the context of transactions LAB-1, LAB-2, LAB-3, the first sub-component (EIP-1) is populated with the specimen ID assigned by the Order Placer Actor, if available. The second sub-component (EIP-2) is populated with the specimen ID assigned by the Order Filler Actor, if available.
- In the context of transactions LAB-4 and LAB-5, EIP-1 is populated with the specimen ID assigned by an Actor preceding the Automation Manager in the workflow, if available. EIP-2 is populated with the specimen ID assigned by the Automation Manager or by a Laboratory Device, if available.
- 505 • In the context of transactions LAB-21, LAB-22, LAB-26 (in LDA profile), EIP-1 is populated with the specimen ID assigned by an Actor preceding the Laboratory Device, if available. EIP-2 is populated with the specimen ID assigned by a Laboratory Device, if available.
- 510 • In the context of transactions LAB-61 and LAB-62, EIP-1 is populated with the specimen ID assigned by the Label Information Provider Actor. EIP-2 is never populated.
- In the context of transactions LAB-27, LAB-28, LAB-29 (in LAW profile), EIP-1 is populated with the specimen ID assigned by an Actor preceding the Analyzer, if available. EIP-2 is never populated.

Condition predicate for Order Groups:

- 515 • In the context of all transactions dealing with orders, the first sub-component (EIP-1) is populated with the Order Group identifier assigned by the Order Placer application, if known, and the second sub-component (EIP-2) is populated with the Order Group identifier accessioned by the Order Filler application, if known.

**2.4.6.4 HD – Hierarchic Designator**

SEQ	LEN	DT	Usage	CARD	TBL #	COMPONENT NAME
1	20	IS	R	[1..1]	0300	Namespace ID
2	199	ST	C			Universal ID
3	6	ID	C		0301	Universal ID Type

- 520 This Integration Profile requires that a field of Data Type HD be populated with:
- Either the first component “Namespace ID” alone, which in this case contains a local identifier of the object.
  - Or with all three components, “Namespace ID” containing the name of the object, “Universal ID” containing its universal OID, and “Universal ID Type” containing the value **ISO**.
- 525

This data type is particularly used in this technical framework to identify facilities, applications and assigning authorities: sending and receiving applications, sending and receiving facilities, last update facility, assigning authority of an identifier, etc.

530 **3 IHE Transactions**

**3.1 Placer Order Management (LAB-1)**

**3.1.1 Scope**

535 This transaction is used by the Order Placer to place an Order Group (i.e., a set of Orders to be tested together for a patient) or a standalone Order to the Order Filler. The transaction enables both Order Placer and Order Filler to notify all subsequent changes of status and/or content of each Order to the other side.

An Order contains a battery or a single test requested to a laboratory. The tests are to be performed on one or more in vitro specimens collected from the patient.

540 An Order accepted by the Order Filler is acknowledged to the Order Placer as scheduled by the laboratory: Order Status ORC-5 = “SC” (scheduled)

When the accurate specimens for this Order are accepted or collected by the laboratory the Order Filler notifies the start of the process to the Order Placer: Order Status ORC-5 = “IP” (in process).

545 When the first results of an Order are released the Order Filler notifies to the Order Placer the Order Status ORC-5 = “A” (some, but not all, results available).

When all results of an Order are released the Order Filler notifies to the Order Placer the Order Status ORC-5 = “CM” (completed).

Both Order Placer and Order Filler may update or cancel an existing Order. Update consists in replacing the ordered test or battery by another one.

550 An Order canceled ends with Order Status ORC-5 = “CA” (canceled).

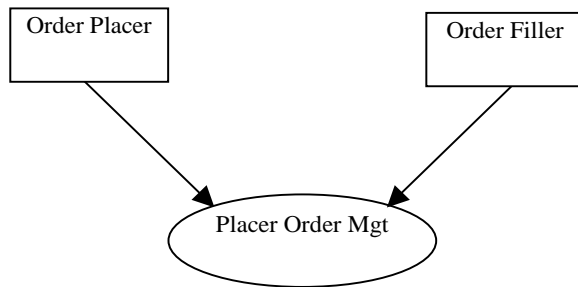
To request an additional battery or test in an existing Order Group the Order Placer places a new Order added to this Order Group.

To generate an additional battery or test in an existing Order Group the Order Filler uses transaction LAB-2, not LAB-1.

555 In addition, if the “Report Facsimile For Order Group” option is activated, this transaction MAY include into an Order Group placed, the request for the facsimile of the report related to that Order Group.

560

565 **3.1.2 Use Case Roles**



**Actor:** Order Placer

570 **Roles:** Places orders. Updates orders. Cancels orders. Nullifies orders. Receives acceptance or rejection from the Order Filler. Receives Order content and status changes from the Order Filler.

**Actor:** Order Filler

575 **Roles:** Receives orders. Checks the specimens required, and notifies the Order Placer of acceptance or refusal. Receives Order content changes from the Order Placer. Notifies content updates (removed batteries/tests) to the Order Placer. Notifies status changes (scheduled, started, cancelled, completed) to the Order Placer.

**3.1.3 Referenced Standards**

HL7 version 2.5:

- Chapter 2: "Control" --> generic segments and data types
- Chapter 3: "ADT" --> PID and PV1 segments
- 580 • Chapter 4: "Order Entry" --> OML and ORL messages
- Chapter 7: "Observation Reporting" --> SPM segment
- Chapter 13: "Clinical Laboratory Automation" --> SAC segment

**3.1.4 Interaction Diagrams**

585 Trigger events: In all interactions below, the initiator chooses the best OML message structure appropriate to its orders. The responder SHALL respond with the related ORL message structure:

OML^O21 → ORL^O22  
 OML^O33 → ORL^O34  
 OML^O35 → ORL^O36

590 An OML message shall be responded to with exactly one ORL message.

The Filler Order Number is required in the ORL messages. ORL messages SHALL be created by the Order Filler application, and not by a message broker or a communication system. The message broker (an intermediary between the Order Placer and the Order Filler) has no

595 knowledge of the tests being requested and can't accept/reject these test on behalf of the Order Filler.

Simplification of the message flow when Actors OP and ORT are grouped:

600 The blue message flows “Order status change” notified by the Order Filler to the Order Placer in the figure below happen only when the Order Placer and the Order Results Tracker are different applications.

605 Whenever the Order Placer and the Order Results Tracker are grouped in the same application, the Transaction LAB-3 message carrying the status change and possible new results is sufficient to inform that application of the new status of the Order. An “Order status change” message in LAB-1 would be redundant in that case. Therefore, when exchanging with a grouped Order Placer/Order Results Tracker, the Order Filler SHALL NOT send the redundant message “Order Status Change” from Transaction LAB-1. (marked in blue in the figure below)

### 3.1.4.1 Normal Process of a Placer Order

610 The figure below shows the flow of messages in the normal process of a placer order, from placing of the order by the Order Placer, to the "order completed" event notified by the Order Filler.

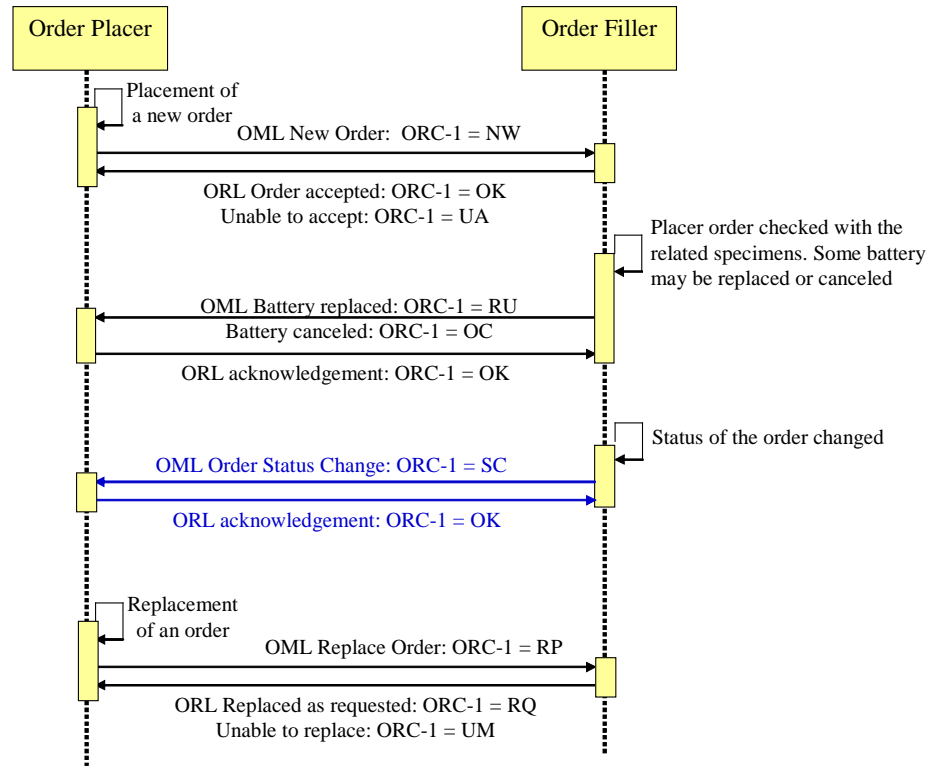


Figure 3.1.4.1-1: Normal process of a placer order

### 615 3.1.4.2 Cancellation of an Order by the Order Placer

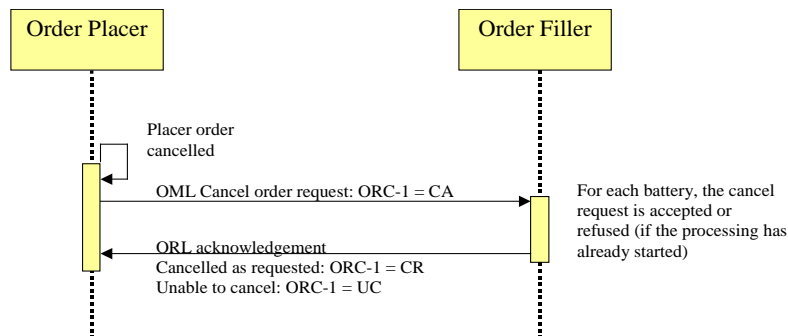


Figure 3.1.4.2-2: Cancellation of an order by the Order Placer

620 The Order Filler accepts the cancellation only if the processing has not started yet, particularly if no work order has been sent to the Automation Manager (through transaction LAB-4).

### 3.1.4.3 Cancellation of an Order Initiated by the Order Filler

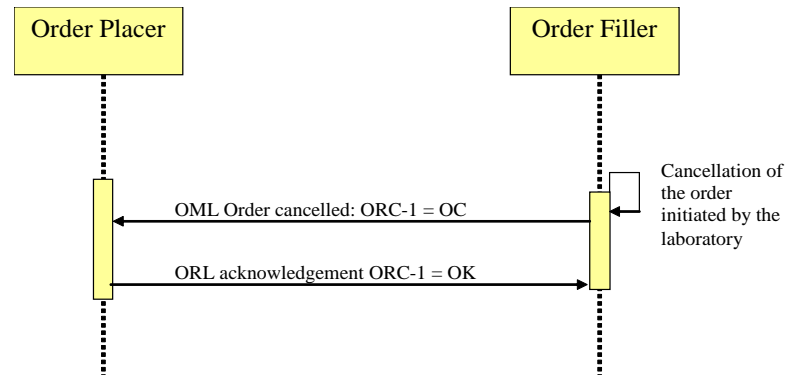


Figure 3.1.4.3-3: Cancellation by Order Filler

## 625 3.1.5 Messages Static Definitions

### 3.1.5.1 Available HL7 2.5 Structures for OML Message

HL7 v2.5 chapter 4, offers three different message structures for the OML message type:

- 630 • **OML^O21^OML\_O21: laboratory order message.** This is a battery-centric structure: It contains a list of ordered batteries, a list of specimens underneath each battery, and a list of containers underneath each specimen. This structure implies duplication of specimen/container information whenever two batteries use the same specimen. It is more appropriate for ordering batteries that need several specimens (e.g., creatinine clearance, glucose tolerance test).
- 635 • **OML^O33^OML\_O33: Laboratory order for multiple orders related to a single specimen.** This is a specimen-centric structure providing for each specimen a list of containers and a list of batteries (ORC/OBR segment groups) using this specimen. The batteries are not related to the containers.
- 640 • **OML^O35^OML\_O35: Laboratory order for multiple orders related to a single container of a specimen.** This message structure provides for each specimen a list of containers, and for each container the list of batteries that are to be performed on that container. This structure is more appropriate when the ordered batteries are sorted by container.

### 3.1.5.2 Restrictions on OML Message for Transaction LAB-1

645 The Laboratory Technical Framework supports the three message structures defined above, and makes the following restrictions for transaction LAB-1:

- 650 • LAB-1 carries all clinical observations provided by the Care Unit, such as allergy, therapy, diagnosis, temperature, urine volume, blood pressure, within observation segments (OBX) that accompany the order. This choice has been made to simplify the building and parsing of the messages. All these specific patient observations are sent in the OML message, in OBX segments.

- 655
- LAB-1 restrains timing/quantity to one execution per order. The main reason for this choice is:
  - The only operation that would have needed the iteration features provided by the segment TQ1 is the specimen collection. In this Laboratory Integration Profile this operation is not triggered by any message: It is an internal operation performed within the Order Placer actor or the Order Filler actor, depending on the organization. All orders sent to laboratories require one single execution, even the studies based on a temporal series of specimens. For example a serum glucose tolerance study is an atomic order to be performed once, taking into account all the specimens to be tested.

660 **3.1.5.3 OML^O21 Static Definition**

**Table 3.1.5.3-1: OML^O21 static definition for transaction LAB-1**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- ORDER begin	R	[1..*]	
ORC	Common Order (for one battery)	R	[1..1]	4
[ TQ1 ]	Timing Quantity	RE	[0..1]	4
	--- OBSERVATION REQUEST begin	R	[1..1]	
OBR	Observation Request	R	[1..1]	4
{ [NTE] }	Notes and Comments	O	[0..*]	2
[ {	--- OBSERVATION begin	O	[0..*]	
OBX	Observation Result	R	[1..1]	7
[ {NTE} ]	Comment of the result	C	[0..*]	2
}]	--- OBSERVATION end			
[ {	--- SPECIMEN begin	O	[0..*]	
SPM	Specimen	R	[1..1]	7
[ {SAC} ]	Container	C	[0..*]	13
}]	--- SPECIMEN end			
[ {	--- PRIOR_RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3
{	--- ORDER_PRIOR begin	R	[1..*]	
ORC	Common Order - previous result	R	[1..1]	4
OBR	Order Detail - previous result	R	[1..1]	4
{ [NTE] }	Notes and Comments - previous result	O	[0..*]	2
{	--- OBSERVATION_PRIOR begin	R	[1..*]	
OBX	Observation/Result - previous result	R	[1..1]	7
{ [NTE] }	Notes and Comments - previous result	O	[0..*]	2



Segment	Meaning	Usage	Card.	HL7 chapter
}	--- OBSERVATION_PRIOR end			
}	--- ORDER_PRIOR end			
] }	--- PRIOR_RESULT end			
}	--- OBSERVATION REQUEST end			
}	--- ORDER end			

665 Field MSH-9 - Message Type (MSG) shall have its three components respectively valued to “OML”, “O21” and “OML\_O21”.

The triplet (ORC, TQ1, OBR) represents the Order (i.e., an ordered battery/test). In case of an Order Group, this triplet is repeated as many times as there are Orders in the Order Group.

The OBSERVATION repeatable segment group carries the observations provided by the orderer (patient temperature, blood pressure, weight, etc.) with eventual comments (NTE).

670 The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

675 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for  
680 “patient class unknown”.

The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

Condition predicate for the SAC segment: This segment should be used only if it provides information that has no placeholder in the SPM segment.

685 Condition predicate for the NTE segment below OBX (Comment of the result): Information that can be coded in OBX segments or OBR segments shall not be sent in a NTE segment.

### 3.1.5.4 ORL^O22 Static Definition

Table 3.1.5.4-2: ORL^O22 Message

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ {ERR} ]	Error	C	[0..*]	2
[	--- RESPONSE begin	C	[0..1]	
[	--- PATIENT begin	R	[1..1]	
[ PID ]	Patient Identification	O	[0..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
{	--- ORDER begin	R	[1..*]	
ORC	Common Order	R	[1..*]	4
[ {TQ1} ]	Timing/Quantity	RE	[0..1]	4
	--- OBSERVATION REQUEST begin	R	[1..1]	
OBR	Observation Request	R	[1..1]	4
[ {	--- SPECIMEN begin	O	[0..1]	
SPM	Specimen	R	[1..1]	7
[ {SAC} ]	Specimen Container Details	O	[0..*]	7
} ]	--- SPECIMEN end			
	--- OBSERVATION REQUEST end			
}	--- ORDER end			
]	--- PATIENT end			
]	--- RESPONSE end			

690 MSH-9 - Message Type (MSG) shall have its three components respectively valued to “ORL”, “O22” and “ORL\_O22”.

The ERR segment shall be used in case of negative acknowledgement (when MSA-1 = AE or AR).

695 The RESPONSE segment group is mandatory unless in case of error (MSA-1 = AE or AR). This segment group carries the response of the Order Filler in the segments ORC and OBR.

The mandatory ORC and OBR segments in the repeatable ORDER segment group provide the response of the Order Filler for each order, in particular the ORC-1 Order Control field.

### 3.1.5.5 OML^O33 Static Definition

700

Table 3.1.5.5-3: OML^O33

Segment	Meaning	Usage	Card.	HL7
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..*]	7
[ {SAC} ]	Specimen Container	C	[0..*]	13
{	--- ORDER begin	R	[1..*]	
ORC	Common Order (for one battery)	R	[1..*]	4
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
	--- OBSERVATION REQUEST begin	R	[1..1]	
OBR	Observation Request	R	[1..1]	4
[ {	--- OBSERVATION begin	O	[0..*]	

Segment	Meaning	Usage	Card.	HL7
OBX	Observation Result	R	[1..1]	7
[ {NTE} ]	Notes and comments for result	C	[0..1]	
] ]	--- OBSERVATION end			
[ {	--- PRIOR RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3
{	--- ORDER PRIOR begin	R	[1*]	
ORC	Common order – previous result	R	[1..1]	4
OBR	Order detail – previous result	R	[1..1]	4
{	--- OBSERVATION PRIOR begin	R	[1..*]	
OBX	Observation/Result – previous result	R	[1..1]	
[ {NTE} ]	Comment of the result	C	[0..*]	2
}	--- OBSERVATION PRIOR end			
}	--- ORDER PRIOR end			
] ]	--- PRIOR RESULT end			
	--- OBSERVATION REQUEST end			
}	--- ORDER end			
}	--- SPECIMEN end			

MSH-9 - Message Type (MSG) shall have its three components respectively valued to “OML”, “O33”, and “OML\_O33”.

The conditions on the OBSERVATION segment group are the same as for OML^O21.

705 The condition and cardinalities on the SAC segment are the same as for OML^O21.

The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

710 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this  
715 message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for “patient class unknown”.

The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

### 3.1.5.6 ORL^O34 Static Definition

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**Table 3.1.5.6-4: ORL^O34**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ {ERR} ]	Error	O	[0..*]	2
[	--- RESPONSE begin	C	[0..1]	
[	--- PATIENT begin	R	[1..1]	
[ PID ]	Patient Identification	O	[0..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
[ {SAC} ]	Specimen Container	O	[0..*]	13
{	--- ORDER begin	R	[1..*]	
ORC	Common Order	R	[1..1]	4
[ {TQ1} ]	Timing/Quantity	RE	[0..1]	4
OBR	Observation Request	R	[1..1]	4
}	--- ORDER end			
}	--- SPECIMEN end			
]	--- PATIENT end			
]	--- RESPONSE end			

725 MSH-9 - Message Type (MSG) shall have its three components respectively valued to “ORL”, “O34” and “ORL\_O34”.

The RESPONSE segment group is mandatory unless in case of error (MSA-1 = AE or AR). This segment group carries the response of the Order Filler in the segments ORC and OBR.

The mandatory ORC and OBR segments in the repeatable ORDER segment group provide the response of the Order Filler for each order, in particular the ORC-1 Order Control field.

### 730 3.1.5.7 OML^O35 Static Definition

**Table 3.1.5.7-5: OML^O35 static definition for transaction LAB-1**

Segment	Meaning	Usage	Card	HL7
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
{	--- CONTAINER begin	R	[1..*]	
SAC	Container detail	R	[1..1]	13
{	--- ORDER begin	R	[1..*]	

Segment	Meaning	Usage	Card	HL7
ORC	Common Order (for one battery)	R	[1..1]	4
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
	--- OBSERVATION REQUEST begin	R	[1..1]	
OBR	Observation Request	R	[1..1]	4
[ {	--- OBSERVATION begin	O	[0..*]	
OBX	Observation Result	R	[1..*]	7
[ {NTE} ]	Comment of the result	C	[0..*]	2
}]	--- OBSERVATION end			
[ {	--- PRIOR_RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3
{	--- ORDER_PRIOR begin	R	[1..*]	
ORC	Common Order - previous result	R	[1..1]	4
OBR	Order Detail - previous result	R	[1..1]	4
{[NTE]}	Notes and Comments - previous result	O	[0..*]	2
{	--- OBSERVATION_PRIOR begin	R	[1..*]	
OBX	Observation/Result - previous result	R	[1..1]	7
{[NTE]}	Notes and Comments - previous result	O	[0..*]	2
}	--- OBSERVATION_PRIOR end			
}	--- ORDER_PRIOR end			
}]	--- PRIOR_RESULT end			
	--- OBSERVATION REQUEST end			
}	--- ORDER end			
}	--- CONTAINER end			
}	--- SPECIMEN end			

735 Field MSH-9 - Message Type (MSG) shall have its three components respectively valued to “OML”, “O35” and “OML\_O35”.

The conditions on the OBSERVATION segment group are the same as for message OML^O21.

The SAC segment below the SPM segment is mandatory in OML^O35 message structure.

740 The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

745 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for “patient class unknown”.

750 The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

### 3.1.5.8 ORL^O36 Static Definition

**Table 3.1.5.8-6: ORL^O36**

Segment	Meaning	Usage	Card.	HL7
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ {ERR} ]	Error	C	[0..*]	2
[	--- RESPONSE begin	C	[0..1]	
[	--- PATIENT begin	R	[1..1]	
PID	Patient Identification	O	[0..1]	3
{	--- SPECIMEN begin			
SPM	Specimen	R	[1..*]	7
{	--- CONTAINER begin	R	[1..*]	
SAC	Specimen Container	R	[0..*]	13
{	--- ORDER begin	R	[1..*]	
ORC	Common Order	R	[1..*]	4
[ {TQ1} ]	Timing/Quantity	RE	[0..1]	4
OBR	Observation Request	R	[1..1]	4
}	--- ORDER end			
}	--- CONTAINER end			
}	--- SPECIMEN end			
]	--- PATIENT end			
]	--- RESPONSE end			

755 MSH-9 - Message Type (MSG) shall have its three components respectively valued to “ORL”, “O36” and “ORL\_O36”.

The RESPONSE segment group is mandatory unless in case of error (MSA-1 = AE or AR). This segment group carries the response of the Order Filler in the segments ORC and OBR.

The mandatory ORC and OBR segments in the repeatable ORDER segment group provide the response of the Order Filler for each order, in particular the ORC-1 Order Control field.

760 The SAC segment below the SPM is mandatory in ORL^O36 message structure.

### 3.1.5.9 Specific Segments Description for Transaction LAB-1

#### 3.1.5.9.1 OBR - Observation Request Segment

HL7 v2.5: chapter 4 (4.5.3)

765

**Table 3.1.5.9.1-1: OBR - Observation Request Segment**

SEQ	LE N	DT	Usage	Card.	TBL #	ITEM#	Element name
2	22	EI	R	[1..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	X	[0..0]		00241	Observation Date/Time #
8	26	TS	X	[0..0]		00242	Observation End Date/Time #
9	20	CQ	X	[0..0]		00243	Collection Volume *
10	250	XCN	RE	[0..*]		00244	Collector Identifier *
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	R	[1..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	X	[0..0]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	C	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	C	[0..1]	0123	00258	Result Status +
26	400	PRL	X	[0..0]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	C	[0..*]		00260	Result Copies To
29	200	EIP	X	[0..0]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
37	4	NM	X	[0..1]		01028	Number of Sample Containers *
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.

**OBR-2 Placer Order Number (EI)**, required in transaction LAB-1.

770 Each ordered battery/test should be assigned to a unique Order, identified by a unique Placer Order Number. The same identifier will never be used twice by the Order Placer. The Placer Order Number is generated by the Order Placer actor and should be unique across all OBR segments across all messages. Please refer to section 2.4.6.1 for the details of the data type.

**OBR-3 Filler Order Number (EI)**, required if available.

775 Each Order should be assigned a unique Filler Order Number by the Order Filler Actor. The same identifier will never be used twice by the Order Filler. The filler order number generated by the Order Filler should be unique across all OBR segments across all messages. Please refer to section 2.4.6.1 for the details of the data type.

**OBR-4 Universal Service Identifier (CE)**, required.

This field contains one ordered battery or test. A battery is composed of one or more tests or batteries.

780 Additionally, when the “Report Facsimile For Order Group” option is activated, when placing an Order Group, the Order Placer MAY request this service in an extra (ORC/OBR) segment group. In that case this requested service SHALL be identified in this field using either the LOINC code: 11502-2^ LABORATORY REPORT.TOTAL^LN or one of the LOINC codes for laboratory specialties listed in LAB TF-3: Table 2.3.4.1.1-1. For instance, the request for a  
785 microbiology report facsimile shall populate OBR-4 with: 18725-2^ MICROBIOLOGY STUDIES^LN

**OBR-5 Priority and OBR-6 Requested Date/Time**

These two fields are not supported. See TQ1 segment.

790 **OBR-7, OBR-8, OBR-12, OBR-14, OBR-15** These fields are not supported. See SPM segment that supersedes them.

**OBR-10 Collector Identifier**, required if available.

This repeatable field contains the specimen collectors’ identification.

**OBR-11 Specimen Action Code (ID)**, required if available.

The value of this field is dependent on the use case as described in Volume 1.

795 The field identifies the action to be taken with respect to the specimens that accompany or precede this order. The purpose of this field is to further qualify (when appropriate) the general action indicated by the order control code contained in the accompanying ORC segment.

HL7 Table 0065 - Specimen Action Code gives the valid values:

800 **Table 3.1.5.9.1-2: HL7 Table 0065 - Specimen Action Code**

Value	Description	Comment
A	Add ordered tests to the existing specimen	
G	Generated order; reflex order	
L	Lab to obtain specimen from patient	



Value	Description	Comment
O	Specimen obtained by service other than Lab	
P	Pending specimen; Order sent prior to delivery	
R	Revised order	
S	Schedule the tests specified below	

**OBR-13 Relevant Clinical information (ST)**, not supported.

Transaction LAB-1 uses OBX segment to carry relevant clinical information, or a NTE segment below the OBR for more comment orientated information.

805 **OBR-16 Ordering Provider (XCN)**, required.

**OBR-17 Order Callback Phone Number (XTN)**, required if available.

HL7 definition: This field contains the telephone number for reporting a status or a result using the standard format with extension and/or beeper number when applicable.

One or two phone numbers.

810 **OBR-22 Results Rpt/Status Chng - Date/Time (TS)**, not used in LAB-1: OBR-22 is related to the RESULT, not to the ORDER. OBR-22 is related to OBR-25. ORC-9 contains the date/time of the latest status change of the ORDER.

**OBR-24 Diagnostic Serv Sect ID (ID)**, conditional

815 Condition predicate: This field may be valued in OML messages sent by the Order Filler. In other words this field is RE for the order filler actor. The valid values are defined in HL7 Table 0074 - Diagnostic Service Section ID. The table below presents a subset of these valid values as identified in Volume 1.

**Table 3.1.5.9.1-3: HL7 Table 0074 - Diagnostic Service Section ID (subset)**

Value	Description	Addressed by Laboratory TF 2003 - 2004
BG	Blood Gases	Yes
CH	Chemistry	Yes
CP	Cytopathology	
HM	Hematology	Yes
IMM	Immunology	Yes
LAB	Laboratory	Yes
MB	Microbiology	Yes
MCB	Mycobacteriology	Yes
MYC	Mycology	Yes
OSL	Outside Lab	
SR	Serology	Yes
TX	Toxicology	Yes
VR	Virology	Yes

820

**OBR-25 Order Result Status (ID), Conditional.**

Condition predicate: This field shall not be filled in messages sent by the Order Placer. This field shall be filled in messages sent by the Order Filler, according to HL7 Table 0123 described in Chapter 7 of HL7. In this version of the Laboratory Technical Version, the possible values for this field are a subset of this table:

825

**HL7 Table 0123 - Result Status**

Value	Description	Comment
O	Order received; specimen not yet received	
I	No results available; specimen received, procedure incomplete	
S	No results available; procedure scheduled, but not done	
R	Results stored; not yet verified	
P	Preliminary: A verified early result is available, final results not yet obtained	
F	Final results; results stored and verified. Can only be changed with a corrected result.	
C	Correction to results	
X	No results available. Order canceled	

Note: For the conditions of use of these values, please read section 3.10 "Correlations of status between ORC, OBR and OBX".

830

**OBR-28 Result Copies To (XCN), conditional.**

HL7 Definition: This field identifies the people who are to receive copies of the results. By local convention, either the ID number or the name may be absent.

Condition predicate: The Order Placer shall fill this field when it sends a new order for which there are persons or care units declared for receiving a copy of the results.

835

**3.2 Filler Order Management (LAB-2)****3.2.1 Scope**

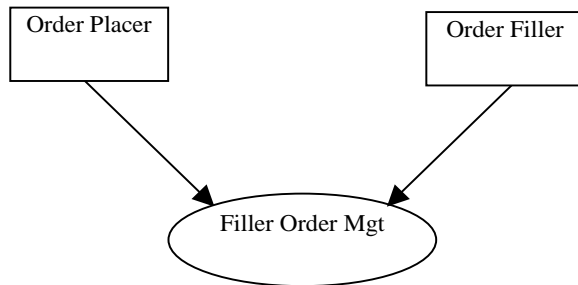
This transaction is supporting the general use case "*Filler order with specimens identified by third party or collected by the laboratory*" described in LAB TF-1:4.2.3.

840

This transaction is used by the Order Filler to inform the Order Placer that a new Order, standalone or embedded in an existing Order Group, has been generated on the laboratory side. By this transaction, the Order Filler Actor requests the Order Placer to assign a unique Placer Order Number to this new Order. The Order contains a battery or a test to be performed by the laboratory, using biological specimens collected from the subject.

845

**3.2.2 Use Case Roles**



**Actor:** Order Placer

**Roles:** Receives filler orders. Notifies the Order Filler of acceptance or refusal. Notifies the Order Filler of the placer order number if the filler order was accepted.

**Actor:** Order Filler

**Roles:** Notifies filler orders to the Order Placer. Receives acceptance or rejection from the Order Placer. Receives the Placer Order Number from the Order Placer if the Order was accepted.

### 3.2.3 Referenced Standards

855 HL7 version 2.5:

- Chapter 2: "Control" --> generic segments and data types
- Chapter 3: "ADT" --> PID and PV1 segments
- Chapter 4: "Order Entry" --> OML and ORL messages
- Chapter 7: "Observation Reporting" --> SPM segment
- Chapter 13: "Clinical Laboratory Automation" --> SAC segment

### 3.2.4 Interaction Diagrams

Trigger events: In all interactions below, the initiator chooses the best OML message structure appropriate to its orders. The responder SHALL respond with the related ORL message structure:

865                                    OML^O21 → ORL^O22  
                                          OML^O33 → ORL^O34  
                                          OML^O35 → ORL^O36

An OML message shall be responded to with exactly 1 ORL message.

870 ORL messages SHALL be created by the Order Placer application, and not by a message broker. The message broker (an intermediary between the Order Filler and the Order Placer) has no knowledge of the tests being requested and can't assign identification numbers on behalf of the Order Placer.

### 3.2.4.1 Process of a Filler Order

875 The figure below shows the flow of messages in the normal process of a filler order. A Filler Order is placed, and responded to by either a rejection or acceptance.

Note that the creation of a filler order may be triggered by a prior placer order, e.g., if the results of one of the previously ordered tests triggers the laboratory to perform additional tests. The creation of a filler order could also happen during the quality control performed by the laboratory on a new order received from the Order Placer: the laboratory may then decide that some extra battery that was not ordered should be added, e.g., regarding the pathology context.

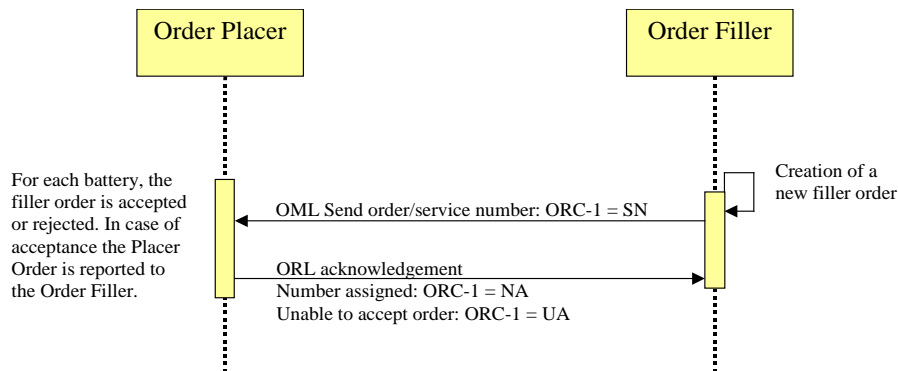


Figure 3.2.4.1-1: Process of a filler order

## 885 3.2.5 Messages Static Definitions

### 3.2.5.1 Restrictions on OML Messages for Transaction LAB-2

Transaction LAB-2 allows all message types used by transaction LAB-1. See paragraph 4.5.1 for a detailed description.

890 The following restriction is made for transaction LAB-2: Timing/quantity is limited to one instance per order (i.e., there is one iteration of the TQ1 segment related to an OBR). The main reason for this choice is that collecting the specimens is not delegated to a separate actor in this cycle of the IHE Laboratory Technical Framework. The collection process is part of either the Order Placer or the Order Filler. See the explanation given in LAB-1 section.

### 3.2.5.2 OML and ORL Messages Static Definitions

895 The static definitions of the messages in LAB-2 are equal to the static definition for LAB-1. See paragraph 4.5.3 up to paragraph 4.5.8 for details.

### 3.2.5.3 Specific Segments Description for Transaction LAB-2

#### 3.2.5.3.1 OBR - Observation Request Segment

HL7 v2.5: chapter 4 (4.5.3)

900

**Table 3.2.5.3.1-1: OBR - Observation Request Segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
2	22	EI	C	[0..1]		00216	Placer Order Number
3	22	EI	R	[1..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	X	[0..0]		00241	Observation Date/Time #
8	26	TS	X	[0..0]		00242	Observation End Date/Time #
9	20	CQ	X	[0..0]		00243	Collection Volume *
10	250	XCN	RE	[0..*]		00244	Collector Identifier *
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	RE	[0..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	X	[0..0]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	RE	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	X	[0..0]	0123	00258	Result Status +
26	400	PRL	X	[0..0]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	C	[0..*]		00260	Result Copies To
29	200	EIP	X	[0..0]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
37	4	NM	X	[0..1]		01028	Number of Sample Containers *
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
48	250	CWE	X	[0..0]	<a href="#">0476</a>	01646	Medically Necessary Duplicate Procedure Reason.

**OBR-2 Placer Order Number (EI)**, conditional.

905 Condition predicate: Used only in the ORL message sent back by the Order Placer to acknowledge an accepted filler order. In that case ORC-1 = “NA” (number assigned). Not used in OML messages of LAB-2.

**OBR-3 Filler Order Number (EI)**, required.

910 Note that all batteries/tests contained in the filler order should be assigned a unique identifier. The same identifier will never be used twice. The filler order number should be unique across all OBR segments across all messages ever sent by the order filler. Please refer to section 2.4.6.1 for the details of the data type.

**OBR-4 Universal Service Identifier (CE)**, required

This field contains one ordered battery or test. A battery is composed of one or more tests or one or more batteries.

915 **OBR-5 Priority and OBR-6 Requested Date/Time**

These two fields are not supported. See TQ1 segment.

**OBR-7, OBR-8, OBR-12, OBR-14, OBR-15** These fields are not supported. See SPM segment for fields that supersedes them.

**OBR-10 Collector Identifier**, required if available.

920 This repeatable field contains the specimen collectors’ identification.

**OBR-11 Specimen Action Code (ID)**, required if available.

The value of this field is dependent on the use case as described in volume 1.

925 The field identifies the action to be taken with respect to the specimens that accompany or precede this order. The purpose of this field is to further qualify (when appropriate) the general action indicated by the order control code contained in the accompanying ORC segment.

HL7 Table 0065 - Specimen Action Code gives the valid values:

**Table 3.2.5.3.1-2: HL7 Table 0065 - Specimen Action Code**

Value	Description	Comment
G	Generated order; filler order	

930 **OBR-13 Relevant Clinical information (ST)**, not supported.

Instead of OBR-13, transaction LAB-2 uses OBX segment to carry relevant clinical information, or a NTE segment below the OBR for more comment orientated information.

**OBR-16 Ordering Provider (XCN)**, required if available.

935 **OBR-17 Order Callback Phone Number (XTN)**, required if available. One or two phone numbers.

**OBR-24 Diagnostic Serv Sect ID (ID)**, required if available.

The valid values are defined in HL7 Table 0074 - Diagnostic Service Section ID. The table below presents a subset of these valid values as identified in volume 1.

940

**Table 3.2.5.3.1-3: HL7 Table 0074 - Diagnostic Service Section ID (subset)**

Value	Description	Addressed by Laboratory TF 2003 - 2004
BG	Blood Gases	Yes
CH	Chemistry	Yes
CP	Cytopathology	
HM	Hematology	Yes
IMM	Immunology	Yes
LAB	Laboratory	Yes
MB	Microbiology	Yes
MCB	Mycobacteriology	Yes
MYC	Mycology	Yes
OSL	Outside Lab	
SR	Serology	Yes
TX	Toxicology	Yes
VR	Virology	Yes

**OBR-28 Result Copies To (XCN)**, conditional.

HL7 Definition: This field identifies the persons who are to receive copies of the results. By local convention, either the ID number or the name may be absent.

945

Condition predicate: If there are known individuals or care units that should receive a copy of results related to this order, they should be listed here.

### 3.3 Order Results Management (LAB-3)

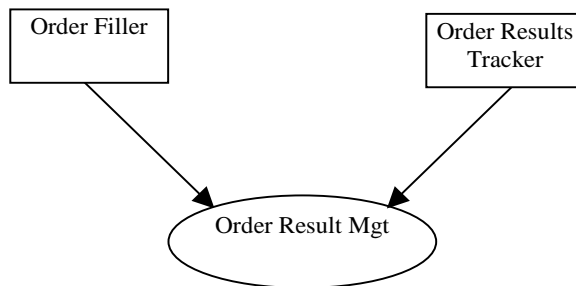
#### 3.3.1 Scope

950 This transaction notifies the Order Result Tracker of requested tests upon creation of an order or reception of a specimen in the laboratory. It transmits the observation results from the Order Filler to the Order Result Tracker, when a result is acquired, clinically validated, modified or deleted at the Order Filler level. Another goal of this transaction is to provide the Order Result Tracker with the complete sorted set of results related to an Order Group or to an Order. The

955 Order Result Tracker shall store these results in the sorting order given by the Order Filler. In addition, if the “Report Facsimile For Order Group” option is activated, this transaction MAY provide in the results messages related to an Order Group a PDF report built by the OF presenting the releasable results of this Order Group.

960 In order to maintain consistency between order and result messages, the result messages of transaction T3 should refer to primary specimen even in the case where some of the observations are performed on secondary samples that are derived from primary specimen after specific preparation.

#### 3.3.2 Use Case Roles



965 **Actor:** Order Filler

**Roles:** Provides notification to the Order Result Tracker for specimen arrival, acquisition of technically validated results, clinical validation of results, modification/cancellation of results and deletion of tests. Provides the complete sorted set of results related to an Order Group or to an Order.

970 In case the “Report Facsimile For Order Group” option is in use, upon request from the OP the OF complements its results messages related to an Order Group and carrying some clinically validated results, with a link to the PDF report recapitulating the set of clinically validated results completed for this Order Group.

**Actor:** Order Result Tracker

975 **Roles:** Receives test order and results from the Order Filler, gives access to this order and results to the healthcare enterprise, respects the sorting order of the results as received from the Order Filler. In case the “Report Facsimile For Order Group” option is in use, when receiving a result message related to an Order Group providing a link to the PDF report, the ORT imports this PDF file immediately, and integrates it with the set of results received.



980 **3.3.3 Referenced Standards**

HL7 version 2.5:

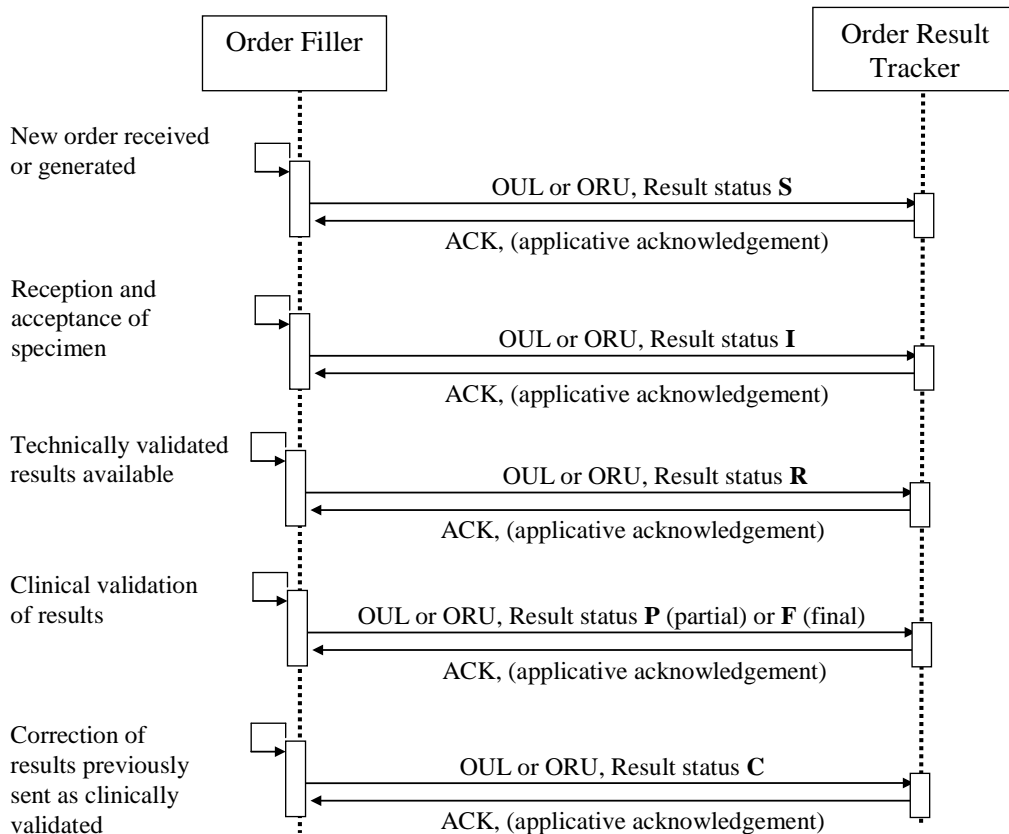
- Chapter 2: "Control" --> generic segments and data types
- Chapter 3: "Patient Administration" --> PID and PV1 segments
- Chapter 4: "Order Entry" --> OBR segment

- 985 • Chapter 7: "Observation Reporting" --> OUL and ORU message structures

**3.3.4 Interaction Diagrams**

**3.3.4.1 Normal Process for Management of Results of a Filler Order**

990 The figures below show the flow of messages that occurs during normal process of a filler order, from the reception of specimen or entry of the order in the laboratory, up to the completion of this order and visualization of results by an end user on the Order Result Tracker. For each triggering event of an OUL or ORU message, the value of the result status of the OBR (OBR-25) is indicated.



**Figure 3.3.4.1-1: Normal process for management of results of a filler order**

- 995 The first interaction appearing in this diagram is triggered by the accession of the Order or of the Order Group by the Order Filler application. The Order Result Status (OBR-25) is valued:
- "S" (Scheduled) if the specimen is not received or collected yet.
  - "I" if the specimen is available in lab.

1000 In this first message, the date/time of transaction for the Order (ORC-9) is a good approximation of the date/time of accession of the Order by the Order Filler application. For an Order Group identified by ORC-4 and comprising several orders, the minimum value of all ORC-9 in the corresponding ORC segments is the approximation of the date/time of accession of the Order Group by the Order Filler application.

1005 The decision whether to deliver or not technically validated results (using OBR-25 "Result Status" "R") to the Order Result Tracker is driven by organization rules specific to each healthcare enterprise. These rules may take account of the order priority (TQ1-9), the ordering provider, the particular ordered battery, the executing laboratory, the observation result itself... The IHE Laboratory Technical Framework does not make any assertion on these rules. It only states that an Order Filler MUST be able to send all the result statuses mentioned in the above diagram, and doing so, MUST conform to the correlation diagrams and transition diagrams presented in section 3.10.

1010 The same remark applies to the sending of partial clinically validated results (using OBR-25 "Result Status" "P").

### 3.3.4.2 Deletion of Battery/Test in a Filler Order

1015 At any time during the process, an ordered test/battery of the order can be deleted from the filler order by the laboratory, which should trigger a message to the Order Result Tracker, with OBR-25 "Result Status" set to "X" for this particular Order, as shown below.

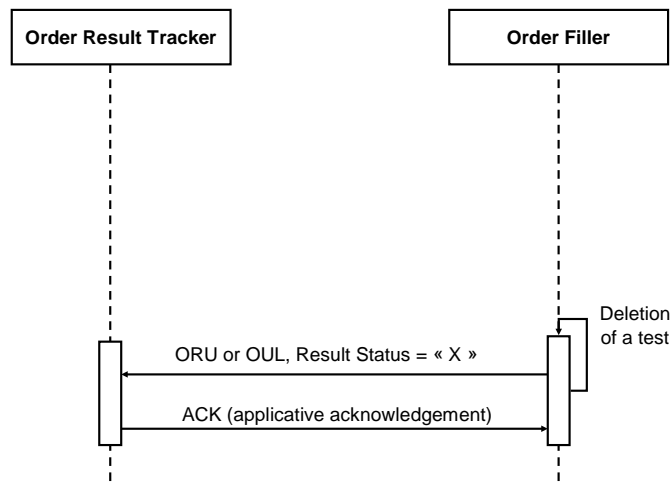


Figure 3.3.4.2-2: Deletion of a test by the Order Filler

### 1020 3.3.4.3 Summary of Events Triggering LAB-3 Messages

The following events detected by the Order Filler application (LIS) will trigger the sending of an OUL or of an ORU message to the Order Result Tracker:

- Entry of an Order at the laboratory level for an already collected specimen
- Reception and acceptance of a specimen for an existing Order
- 1025 • Acquisition of some technically validated results, in the context where transmission of such results is expected by the ward staff.
- Clinical validation of results
- Correction of results previously transmitted
- Cancellation of results previously transmitted
- 1030 • Deletion of tests

### 3.3.5 Messages Static Definitions

Transaction LAB-3 offers two message profiles:

- The OUL^R22 message is designed for Specimen centered result reporting.
- The ORU^R01 message is designed for Order centered result reporting.

1035 In both message structures the order in which the OBX segments appear defines the sorting order for the presentation of the results for a given battery or specimen. In this respect, the Order Filler shall transmit all available results for the battery or specimen in recapitulative mode no matter whether they have already been transmitted or not.

1040 An Order Filler chooses whichever message profile to use depending upon its own business rules. The Order Filler is not mandated to be able to use both message profiles.

An Order Result Tracker must be able to receive both message structures.

1045 The OUL^R24 message profile designed for multi-specimen batteries was usable in release 1 of the Laboratory Technical Framework. However, the HL7 OUL^R24 message structure is ambiguous in that it gives no clue to the receiver to distinguish between the results (OBX) related to the order and the observations (OBX) related to the last specimen of that order. Therefore, as of its release 2, this Laboratory Technical Framework deprecates OUL^R24 message profile, kept for backward compatibility only, and viewable in:  
[ftp://ftp.ihe.net/Laboratory/Tech\\_Framework/V2/ihe\\_lab\\_TF\\_2.0\\_Vol1\\_FT\\_2006-12-04.doc](ftp://ftp.ihe.net/Laboratory/Tech_Framework/V2/ihe_lab_TF_2.0_Vol1_FT_2006-12-04.doc)

#### 3.3.5.1 OUL^R22 Static Definition

1050

**Table 3.3.5.1-1: OUL^R22 static definition**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..*]	

Segment	Meaning	Usage	Card.	HL7 chapter
SPM	Specimen	R	[1..1]	7
[ {OBX} ]	Observation related to specimen	O	[0..*]	
[ {SAC} ]	Container information	O	[0..*]	13
{	--- ORDER begin	R	[1..*]	
OBR	Observation Request	R	[1..*]	4
ORC	Common Order (for one specimen)	R	[1..1]	4
[ {NTE} ]	Comments on the order	O	[0..*]	2
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
[ {	--- RESULT begin	O	[0..*]	
OBX	Observation related to OBR	R	[1..*]	7
[ {NTE} ]	Comment of the result	C	[0..*]	2
}]	--- RESULT end			
}	--- ORDER end			
}	--- SPECIMEN end			

Field MSH-9 – Message Type shall have its three components valued as follows:  
OUL^R22^OUL\_R22

1055 For specimen oriented observation message, additional parameters that are related to the specimen (e.g., Anatomic origin, Collection procedure) should be transmitted in OBX segments that immediately follow the SPM segment.

1060 For each set of observations (e.g., Microscopy; Culture; Antibiotic Susceptibility) the Order Filler should generate an OBR segment that identifies the Observation followed by a series of OBX segments, each of them carrying the result of an individual test/observation.

1065 Following the SPM segment, the Order Filler should systematically transmit in the OUL message, all OBR and OBX segments related to this SPM. This systematic transmission of all observations linked to an SPM segment and their respective status may help the Order Result Tracker to recover from an error situation, when for some hazardous reasons a previous OUL message for the same request could not have been properly processed. For the same reason the "U" value should not be used in the Observation Result Status field of an OBX segment (see description of this segment in section 3.9 of this document).

1070 In case an observation previously transmitted is deleted, the Order Filler should transmit all OBX segments linked to the OBR to which the deleted observation relates to; and it should indicate the current status of each OBX segment. The Observation Result Status field of the OBX that correspond to the deleted observation should be valued with a "D".

Unless the Report Status field (OBR-25) of the OBR is valued with an "X" (deleted battery), the OBR segment shall always be followed by one or several OBX segments.

1075 TQ1 and ORC segments shall be transmitted because they contain important information such as the priority of the order and the order group number.

## 3.3.5.2 ORU^R01 Static Definition

Table 3.3.5.2-2: ORU^R01 static definition

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
{	--- PATIENT_RESULT begin	R	[1..1]	
[	--- PATIENT begin	RE	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- ORDER_OBSERVATION begin	R	[1..*]	
ORC	Common Order (for one battery)	R	[1..1]	4
OBR	Observation Request	R	[1..1]	4
[ {NTE} ]	Comments on the order	O	[0..*]	2
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
[ {	--- OBSERVATION begin	O	[0..*]	
OBX	Observation related to OBR	R	[1..1]	7
[ {NTE} ]	Comment of the result	C	[0..*]	2
}]	--- OBSERVATION end			
[ {	--- SPECIMEN begin	O	[0..*]	
SPM	Specimen	R	[1..1]	7
[ {OBX} ]	Observation related to specimen	O	[0..*]	
}]	--- SPECIMEN end			
}	--- ORDER_OBSERVATION end			
}	--- PATIENT_RESULT end			

1080 Field MSH-9 – Message Type shall have its three components valued as follows:  
 ORU^R01^ORU\_R01

1085 The observations and notes produced to fulfill an order are reported as OBX and NTE segments in the OBSERVATION segment group following the ORC/OBR pair representing this order. Each specimen used by this order is described as a SPM segment in an instance of the SPECIMEN segment group following the results of the order. Pre-analytical observations qualifying the usability or characteristics (e.g., volume, collection duration, defect ...) of the specimen may be reported in OBX attached to the SPM segment.

1090 Following the ORC/OBR, the Order Filler should systematically transmit in the message, all OBX and SPM segments related to this ORC/OBR. This systematic transmission of all observations linked to an OBR and their respective status may help the Order Result Tracker to recover from error situations.

1095 For the same reason the "U" value should not be used in the Observation Result Status field of an OBX segment (see description of this segment in Chapter 3.11 earlier in this document).

1100 In case an observation previously transmitted is deleted, the Order Filler should transmit all OBX segments linked to the OBR to which the deleted observation relates to; and it should indicate the current status of each OBX segment. The Observation Result Status field of the OBX that correspond to the deleted observation should be valued with a "D". Unless the Report Status field (OBR-25) of the OBR is valued with an "X" (deleted battery), the OBR segment shall always be followed by one or several SPM and OBX segments.

TQ1 and ORC segments shall be transmitted because they contain important information such as the priority of the order and the Order Group Number.

1105 **3.3.5.3 OBR Segment**

This section describes the OBR segment usage in ORU and OUL messages described above.

1110 The OUL/ORU message corresponding to an Order Group should contain as many OBR segments as Orders involved by the triggering event of the message. For example, upon reception of a specimen in the laboratory, the Order Filler application (the LIS) will generate a message that contains as many OBR segments as batteries or tests requested for this specimen. The modification of a result of an observation will trigger an OUL message that contains the OBR segment describing the related Order.

**Table 3.3.5.3-3: OBR segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
2	22	EI	RE	[0..1]		00216	Placer Order Number
3	22	EI	R	[1..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	C	[0..1]		00241	Observation Date/Time
8	26	TS	X	[0..0]		00242	Observation End Date/Time
9	20	CQ	X	[0..0]		00243	Collection Volume
10	250	XCN	RE	[0..1]		00244	Collector Identifier
11	1	ID	C	[0..1]	0065	00245	Specimen Action Code
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time
15	300	SPS	X	[0..0]		00249	Specimen Source or Segment SPM
16	250	XCN	RE	[0..1]		00226	Ordering Provider
17	250	XTN	X	[0..0]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1
21	60	ST	X	[0..0]		00254	Filler Field 2
22	26	TS	X	[0..0]		00255	Results Rpt/Status Chng – Date/Time

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
23	40	MOC	X	[0..0]		00256	Charge to Practice
24	10	ID	R	[0..0]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	R	[1..1]	0123	00258	Order Result Status
26	400	PRL	C	[0..1]		00259	Parent Result
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	RE	[0..*]		00260	Result Copies To
29	200	EIP	C	[0..1]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
31	250	CE	X	[0..0]		00263	Reason for Study
32	200	NDL	C	[0..1]		00264	Principal Result Interpreter
33	200	NDL	X	[0..0]		00265	Assistant Result Interpreter
34	200	NDL	X	[0..0]		00266	Technician
37	4	NM	X	[0..0]		01028	Number of Sample Containers *
38	250	CE	X	[0..0]		01029	Transport Logistics of Collected Sample
39	250	CE	X	[0..0]		01030	Collector's Comment *
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
44	250	CE	X	[0..0]	0088	00393	Procedure Code
45	250	CE	X	[0..0]	0340	01316	Procedure Code Modifier
46	250	CE	X	[0..0]	0411	01474	Placer Supplemental Service Information
47	250	CE	X	[0..0]	0411	01475	Filler Supplemental Service Information
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.
49	2	IS	X	[0..0]	N	01647	Result Handling

1115

**OBR-2 Placer Order Number (EI), required if available**

This field is required if the value is known to the sender. See section 2.4.6.1 for the details of the data type. In case of a Filler Order, the value of this field will be known to the sender after transaction LAB-2 Filler Order Management (section 5.4.1) has taken place.

1120

**OBR-3 Filler Order Number (EI), required**

This field is required. It allows the Order Result Tracker to link all the Tests/results of a request together. It also identifies the order at the Order Filler level. Please refer to section 2.4.6.1 for the details of the data type.

**OBR-4 Universal Service Identifier (CE), required**

- 1125 The first three sub-fields “Identifier”, “Text” and “Name of Coding System” are required.  
The second sub-field “Text” allows the Order Result Tracker to manage the results without the help of Battery Master File.  
The last three sub-fields are optional.

**OBR-7 Observation Date/Time (TS), conditional**

- 1130 Condition predicate: If the order is related to one single specimen, then OBR-7 SHALL be populated with the content of SPM-17.1, which represents the physiologically relevant date-time (i.e., the time the specimen was collected from the patient). In all other situations this field OBR-7 SHALL be populated with a null value: “”

**OBR-9 Collection Volume (CQ)**

- 1135 Since when it is needed by the laboratory and reported, the volume of collection is the result of an observation (sometimes done by the Order Placer) that can be used for calculation of other results (e.g., Creatinine Clearance); this information should be transferred in an OBX segment as all other results of observation. This field OBR-9 should consequently not be used in this transaction.

1140 **OBR-10 Collector Identifier (XCN)**

This field identifies the person, department or facility that collected the specimen(s).

**OBR-11 Specimen Action Code (ID)**

This field is only required in the following events:

- 1145
- The order is entered at the Order Filler (LIS) level as described in LAB TF-1:4.2.3. The value of the Action Code is A.
  - The battery or test has been added by the Order Filler (LIS) for confirmation of a diagnostic (reflex testing); value G.

In all other triggering events of this transaction, this Action Code field is meaningless.

**OBR-12 Danger Code (CE)**

- 1150 This field should not be used in this first version of Laboratory Technical Framework.

**OBR-13 Relevant Clinical Information (ST)**

- 1155 Since it is stated in the HL7 V2.5 Chapter 7 that "for some orders this information may be sent on a more structured form as a series of OBX segments (see HL7 V2.5 Chapter 7) that immediately follow the order segment", it is preferable and more consistent to systematically use OBX segments in OUL message for sending Clinical Information.

**OBR-14 Specimen Received Date/Time (TS)**

This field should not be used; this information should be transmitted in an SPM segment.

**OBR-15 Specimen Source (SPS)**



1160 As for OBR-13, if this information needs to be transmitted to the Order Result Tracker it is more consistent to transfer it in an OBX segment. This field should not be used.

**OBR-16 Ordering Provider (XCN)**

This field is required if it was part of the order sent by the Order Placer.

**OBR-24 Diagnostic Serv Sect ID (ID)**

1165 This field is required. In case the Order Result Tracker receives part of the results of an entire order at different time, the Order Result Tracker can use this field for presenting all the batteries/test with the same Diagnostic Serv. Sect. ID together.

**OBR-25 Result Status (ID)**

1170 This field is required and should be filled according to HL7 Table 0123 described in Chapter 4. Depending on the triggering event of the OUL message the possible values for this field are:

- Value I is used to indicate reception of specimen(s) at the laboratory. In case a battery or test requires more than one specimen (e.g., Creatinine clearance) this I status has to be used when all the required specimens have been received. An OBR segment with this I status may be followed by OBX segments that contains result of observations performed at specimen collection time (e.g., Volume of collected specimen).  
1175
- Value R, to indicate that some results are available and technically validated but not yet clinically validated.
- Value P, to indicate that some of the results, but not all, are available and have been clinically validated. The identity of the Clinical Expert should in this case be indicated in the OBR-32 field.  
1180
- Value F, to indicate that all results are available and have been clinically validated. The identity of the Clinical Expert should in this case be indicated in the OBR-32 field.
- Value C, to indicate that at least one result contained in one of the following OBX segments has been modified after the results have been transmitted with the F status. This C value should never be used before results have been transmitted with the F status. Since a Corrected result is supposed to be clinically validated, the identity of the Clinical Expert should be indicated in the OBR-32 field when the value of the Result Status is C.  
1185
- Value X, to indicate that the battery/test has been deleted. This deletion could have been, either received from the Order Placer for an already received specimen and accepted by the Order Filler, or decided by the laboratory. This value X should not be used if some results for this test have already been transmitted.  
1190
- Value S, although the usage of this value is mainly in response to a Query message. It can be used in OUL messages for tests that have been added to the original request by the Order Filler (LIS). In this case, the value of the OBR-11 field (Action Code) should be either A, or G.  
1195

Note: For the conditions of use of these values, please read section 3.10 “Correlations of status between ORC, OBR and OBX”.

**OBR-26 Parent Result (PRL)**

1200 This field is used to report spawned orders in microbiology. See section 3.11 for detailed specification of usage.

**OBR-28 Result Copies To (XCN)**

This field may be used to indicate the list of recipients who will receive a hard copy of the results report, which may be useful information for users who have access to these results.

**OBR-29 Parent (EIP)**

1205 This field is used to report spawned orders in microbiology. See section 3.11 for detailed specification of usage.

**OBR-32 Principal Result Interpreter (NDL)**

1210 This field is required when the value of the Results Status field (OBR-25) is P, F or C (corrected results are supposed to be verified). The field identifies who validated the results, where, and when this clinical validation was performed. It describes completely the “Clinical Validation” step.

**OBR-33 Assistant Result Interpreter (NDL)**

This field is meaningless when the value of the Result Status field is different from P, F or C.

**OBR-34 Technician (NDL)**

1215 This field should not be used, as all observations linked to the battery have not necessarily been performed by the same Technician. The OBX-16 (Responsible Observer) should be used instead.

**OBR-35 Transcriptionist (NDL)**

1220 This field is only applicable when the final report has been dictated and transcribed, which is frequent for Histology and Cytology reports.

**OBR-36 Scheduled - Date/Time (TS)**

This field is optional and only applies when the value of the Result Status field (OBR-25) is S.

**OBR-44 Procedure Code (CE)**

1225 This field is in principle meaningless in an OUL message sent by a Laboratory but may be needed in some organizations.

**OBR-45 Procedure Code Modifier (CE)**

This field can be used only when OBR-44 (Procedure Code) is filled.

**3.3.5.4 Use of the Option Report Facsimile For Order Group**

1230 **3.3.5.4.1 PDF Report Provided By Reference**

When this option is activated, if the Order Placer requested this facsimile report service with an Order Group, then messages OUL^R22 and ORU^R01 carrying clinically validated results

related to an Order Group SHALL provide the link to the PDF report recapitulating all clinically validated and reportable results obtained by the sending laboratory for this Order Group.

1235 **3.3.5.4.2 OF Actor Sending Responsibilities Extended for this Option**

If the OP requested the facsimile of the report in an Order Group, when the OF prepares a message containing some clinically validated results for this Order Group, it SHALL construct the PDF report recapitulating all results obtained by the sending laboratory validated and releasable for this Order Group and SHALL include a link to this PDF report in the results message.

1240

When canceling some results previously transmitted to ORT with a PDF report facsimile, if after this cancellation occurs, no result from the sending laboratory remains releasable for this Order Group, then OF SHALL provide a nullified link in the results message, to request the cancellation without replacement of the report facsimile.

1245 **3.3.5.4.3 ORT Actor Receiving Responsibilities Extended for this Option**

Upon reception of a results message carrying such a link, the ORT Actor SHALL follow the link, retrieve the PDF report immediately, and store it attached to the Order Group and its current set of results, replacing any previous report facsimile for this Order Group with this new one.

1250

Upon reception of a results message carrying a nullified link (meaning the previous report transmitted for this Order Group is canceled and not replaced), the ORT Actor SHALL mark the report facsimile as canceled and no longer usable for care purpose.

**3.3.5.4.4 Segment Group Dedicated to the Report Facsimile**

1255

Message ORU^R01 provides this link in a dedicated ORDER\_OBSERVATION segment group, appearing at the bottom of the message. This last ORDER\_OBSERVATION segment group, which was requested by the Order Placer when the Order Group was placed, is composed of only 3 segments: ORC, OBR, OBX.

Message OUL^R22 provides this link through in a dedicated ORDER segment group appearing at the end of the last SPECIMEN segment group of the message. This last ORDER segment group is composed of only 3 segments: OBR, ORC, OBX.

1260

In both message structures the 3 segments introducing the PDF report are populated as follows:

**3.3.5.4.5 ORC Segment Introducing the Laboratory Report for the Order Group**

This segment is populated with at least these 3 fields:

Field	DT	Element name	Value	comment
ORC-1	ID	Order Control	SC	<i>A results message is always a Status Change.</i>
ORC-4	EI	Placer Group Number	<i>The Order Group number</i>	<i>The identifier assigned by the Order Placer to this Order Group.</i>
ORC-9	TS	Date/Time of Transaction	<i>Date time of the triggering event</i>	<i>Date/time of this release of the laboratory report produced for this Order Group.</i>

**3.3.5.4.6 OBR Segment Introducing the Laboratory Report for the Order Group**

This segment is populated with at least these 4 fields:

Field	DT	Element name	Value	comment
OBR-2	EI	Placer Order Number	As assigned by OP	
OBR-3	EI	Filler Order Number	As assigned by OF	
OBR-4	CE	Universal Service Identifier		
OBR-4.1	ST	Code	(1)	<i>This code announces the laboratory report</i>
OBR-4.2	ST	Text	(1)	<i>The LOINC name of this code</i>
OBR-4.3	ID	Name of Coding System	LN	<i>Coding system LOINC</i>
OBR-25	ID	Result Status	P, F, C, X	<i>The report is <b>P</b>reliminary, <b>F</b>inal, <b>C</b>orrected (after final) or canceled (<b>X</b>). When existing, it contains only verified results (i.e., clinically validated).</i>

1265 **Notes**

(1): Use either the LOINC code “11502-2” and the corresponding name “LABORATORY REPORT.TOTA” or one of the LOINC codes for laboratory specialties listed in LAB TF-3:Table 2.3.4.1.1-1, and the corresponding name.

**3.3.5.4.7 OBX Segment Carrying the Link to the Laboratory Report**

1270 This segment is populated with these 6 fields:

Field	DT	Element name	Value	comment
OBX-1	SI	Set ID – OBX	1	
OBX-2	ID	Value Type	RP	<i>Reference Pointer</i>
OBX-3		Observation Identifier		
OBX-3.1	ST	Code	(1)	<i>The observation is the laboratory report itself</i>
OBX-3.2	ST	Text	(1)	<i>The LOINC name of this code</i>
OBX-3.3	ID	Name of Coding System	LN	<i>Coding system LOINC</i>
OBX-5	RP	Observation Value		
OBX-5.1	ST	Pointer	<i>URL of the laboratory report</i>	<i>The syntax of the URL SHALL be conformant with RFC 1738 and RFC 1808.</i>
OBX-5.2	HD	Application ID	<i>unique ID assigned to the OF application</i>	
OBX-5.3	ID	Type Of Data	AP	<i>Other application data. The report is not to be interpreted by a HL7 parser.</i>
OBX-5.4	ID	Subtype	PDF or JPG	<i>The laboratory report is in pdf or jpeg format</i>
OBX-11	ID	Observation Result Status	P, F, C, D	<i>The report is <b>P</b>reliminary, <b>F</b>inal, <b>C</b>orrected, <b>D</b>eleted, or cannot be produced (<b>X</b>). In the two latter cases (D or X) OBX-5.1 SHALL be nullified (i.e., populated with two double quotes)</i>
OBX-13	ST	User Defined Access Checks	P or empty	<i>P means this report should be viewed only by privileged users.</i>

**Notes**

(1): Use either the LOINC code “11502-2” and the corresponding name “LABORATORY REPORT.TOTA” or one of the LOINC codes for laboratory specialties listed in LAB TF-3:Table 2.3.4.1.1-1, and the corresponding name.

1275 **3.3.5.4.8 Example of ORDER\_OBSERVATION Segment Group in an ORU Message**

```

...
ORC|SC|||777^Nephro|||200805191100
OBR|||11502-2^LABORATORY REPORT.TOTAL^LN|||F
1280 OBX|1|RP|11502-2^LABORATORY REPORT.TOTAL^LN|file://hserv/lr/lr12345678.pdf|||F|P
...
ORC|SC|||777^Nephro|||200805191100
OBR|||11502-2^LABORATORY REPORT.TOTAL^LN|||F
1285 OBX|1|RP|11502-2^LABORATORY REPORT.TOTAL^LN|file:///C:/lr/lr12345678.pdf|||F|P

```

**3.3.6 Acknowledgement of OUL and ORU Messages**

OUL and ORU messages received by the Order Result Tracker shall generate a logical acknowledgement message from the Order Result Tracker to the Order Filler. This General Acknowledgement Message ‘ACK’ shall be built according to HL7 V2.5 standard.

1290 **3.4 Work Order Management (LAB-4)**

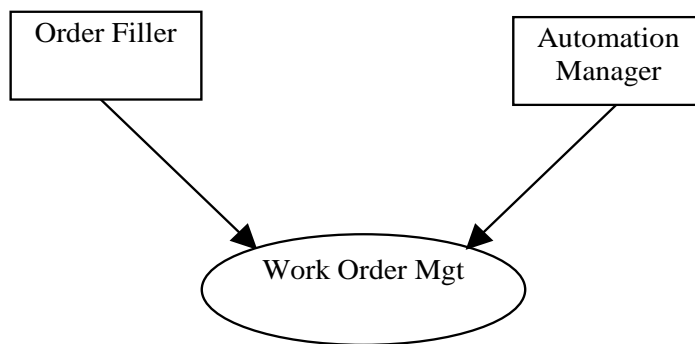
**3.4.1 Scope**

This transaction is used if the Order Filler issues a new order to the Automation Manager.

In addition, this transaction is used to cancel and/or modify an order that was previously sent to the Automation Manager.

1295 It is also possible to cancel a previous order and send a new order to modify it.

**3.4.2 Use Case Roles**



1300 **Actor: Order Filler**

The role: manages orders and takes care of the routing to the appropriate Automation Manager.

**Actor: Automation Manager**

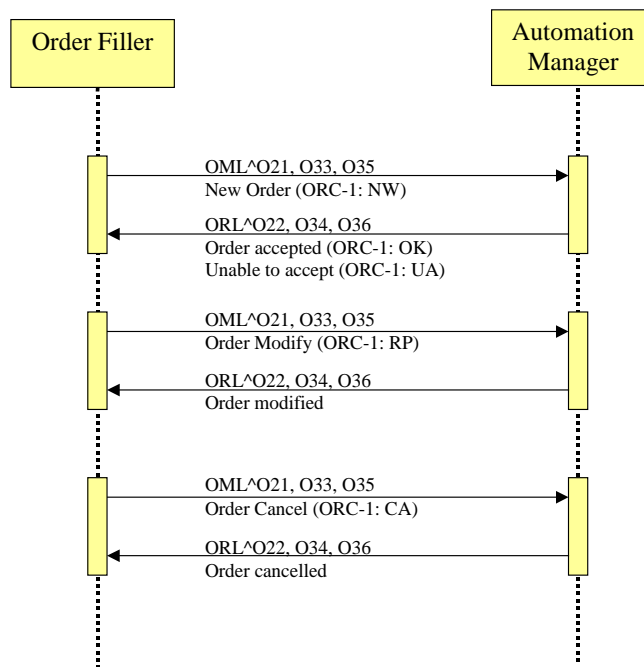
The role: receives the orders from the order filler and manages the preprocessing, the analysis, and the post processing of the order.

1305 **3.4.3 Referenced Standards**

HL7 version 2.5 Chapter 4

**3.4.4 Interaction Diagrams**

1310 ORL messages SHALL be created by the Automation Manager application, and not by a message broker. The message broker (an intermediary between the Order Filler and the Automation Manager) has no knowledge of the tests being requested and can't accept/reject these test on behalf of the Automation Manager.



**Figure 3.4.4-1: Normal process of ordering to Automation Manager**

1315 An OML message shall be responded to with exactly 1 ORL message.

Notes: ORM^O01 is not used, and OML^O21 bears the usage. ORR^O02 is not used either, and ORL^O22 bears the usage.

**3.4.5 Messages Static Definitions**

**3.4.5.1 Laboratory Order Message (OML^O21, ORL^O22)**

1320 The following message is used for analytical messages where it is required that the Specimen/Container information is within ORC/OBR segment group.

**3.4.5.1.1 Trigger Events**

OML(O21): Work order sent by the Order Filler.

ORL (O22): Acknowledgement of the Work Order sent by the Automation Manager.

1325 **3.4.5.1.2 Message Semantics**

Refer to the HL7 standard for the OML message of HL7 2.5 Chapter 4 and the general message semantics.

1330 In addition, when the Order Filler sends a new work order to the Automation Manager, ORC-1 “Order Control Code” is valued with “NW”. When the work order is canceled, ORC-1 is valued with “CA”. The correction of the work order uses value “RP”.

The OBX segments are used to convey the patient’s previous results, as well as some observation provided by the Order Placer or by the Order Filler, such as: blood pressure, patient’s temperature, specimen collection volume...

1335

**Table 3.4.5.1.2-1: OML^021 Message**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- ORDER begin	R	[1..*]	
ORC	Common Order (for one battery)	R	[1..1]	4
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
[	--- OBSERVATION REQUEST begin	O	[0..1]	
OBR	Observation Request	R	[1..1]	4
[ TCD ]	Test Code Details	O	[0..1]	13
[ {	--- OBSERVATION begin	O	[0..*]	
OBX	Observation Result	R	[1..1]	7
[ {NTE} ]	Comment of the result	C	[0..*]	2
}]	--- OBSERVATION end			
[ {	--- SPECIMEN begin	C	[0..*]	
SPM	Specimen	R	[1..1]	7
[ {	--- CONTAINER begin	C	[0..*]	
SAC	Specimen Container	R	[1..1]	13
[ {OBX} ]	Additional specimen characteristics	O	[0..*]	7
}]	--- CONTAINER end			
}]	--- SPECIMEN end			
[ {	--- PRIOR_RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
{	--- ORDER_PRIOR begin	R	[1..*]	
[ ORC ]	Common Order - previous result	R	[1..1]	4
OBR	Order Detail - previous result	R	[1..1]	4
{ [NTE] }	Notes and Comments - previous result	O	[0..*]	2
{	--- OBSERVATION_PRIOR begin	R	[1..*]	
OBX	Observation/Result - previous result	R	[1..1]	7
{ [NTE] }	Notes and Comments - previous result	O	[0..*]	2
}	--- OBSERVATION_PRIOR end			
}	--- ORDER_PRIOR end			
] }	--- PRIOR_RESULT end			
]	--- OBSERVATION REQUEST end			
}	--- ORDER end			

The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

- 1340 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this
- 1345 message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for “patient class unknown”.

The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

- 1350 Field MSH-9 – Message Type shall have its three components valued as follows:  
OML^O21^OML\_O21

PV1 is optional in the LAB-4/LAB-5 segments since Automation manager and analytical instruments do not usually need the outpatient information.

- 1355 The SPECIMEN group is required when the specimen has already been collected and prepared, and is registered in the Order Filler application. In this case, there is at least one SPM segment present in this group. Below each SPM segment, the condition of use of the SAC segment is the one described in the paragraph describing this segment, section 3.10.

If neither Automation Manager nor analytical instruments compare the test result with the previous result, ORC, OBR, and OBX for the previous result are not necessary.

- 1360 The OBX segment in the OBSERVATION group is used for the vital signs if it is necessary for technical validation.

The OBX segment in the CONTAINER group is used when a rerun is ordered.



**Table 3.4.5.1.2-2: ORL^O22 Message**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ {ERR} ]	Error	O	[0..*]	2
[	--- RESPONSE begin	X	[0..0]	
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
{	--- ORDER begin	R	[1..*]	
ORC	Common Order	R	[1..*]	4
[ {TQ1} ]	Timing/Quantity	RE	[0..1]	4
[	--- OBSERVATION REQUEST begin	O	[0..1]	
OBR	Observation Request	R	[1..1]	4
[ {	--- SPECIMEN begin	C	[0..*]	
SPM	Specimen	R	[1..1]	7
[ {SAC} ]	Specimen Container Details	C	[0..*]	7
}]	--- SPECIMEN end			
]	--- OBSERVATION end			
}]	--- OBSERVATION REQUEST end			
]	--- ORDER end			
]	--- PATIENT end			
]	--- RESPONSE end			

1365 Field MSH-9 – Message Type shall have its three components valued as follows:  
ORL^O22^ORL\_O22

This message never carries the RESPONSE segment group. It is therefore limited to the first two or three segments.

### 3.4.5.2 Multiple Orders Related to a Single Specimen (OML^O33, ORL^O34)

#### 1370 3.4.5.2.1 Trigger Events

OML (O33): Work order sent by the Order Filler.

ORL (O34): Acknowledgement of the Work Order sent by the Automation Manager.

The trigger event for this message is “any status change of a work order”. Such changes include submission of new orders, cancellations, updates, etc., where multiple orders are associated with a single specimen, which may be carried in multiple containers.

#### 3.4.5.2.2 Message Semantics

Refer to the HL7 standard for the OML message of HL7 2.5 Chapter 4 and the general message semantics.

1380 In addition, when the Order Filler sends a new work order to the Automation Manager, ORC-1 “Order Control Code” is valued with “NW”. When the work order is canceled, ORC-1 is valued with “CA”. The correction of the work order uses value “RP”.

The OBX segments are used to convey the patient’s previous results, as well as some observation provided by the Order Placer or by the Order Filler, such as: blood pressure, patient’s temperature, specimen collection volume, etc.

1385

Table 3.4.5.2.2-1: OML^O33

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
[ {SAC} ]	Specimen Container	O	[0..*]	
{	--- ORDER begin	R	[1..*]	
ORC	Common Order (for one battery)	R	[1..1]	4
[ {TQ1} ]	Timing Quantity	RE	[0..1]	4
[	--- OBSERVATION REQUEST begin	O	[0..1]	
OBR	Observation Request	R	[1..1]	4
[ TCD ]	Test Code Details	O	[0..1]	13
[ {OBX} ]	Observation Result	C	[0..*]	7
{	--- PRIOR RESULT start	O	[0..*]	
[ PV1 ]	Patient Visit	R	[1..1]	3
[ ORC ]	Common order – prior result	R	[1..1]	4
OBR	Order detail – prior result	R	[1..1]	4
{OBX}	Observation/Result – prior result	R	[1..*]	
[ {NTE} ]	Comment of the result	C	[0..*]	2
}	--- PRIOR RESULT end			
]	--- OBSERVATION REQUEST end			
}	--- ORDER end			
}	--- SPECIMEN end			

Field MSH-9 – Message Type shall have its three components valued as follows:  
OML^O33^OML\_O33

1390 The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

1395 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for “patient class unknown”.

1400

The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

**Table 3.4.5.2.2-2: ORL^O34**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
{{ERR}}	Error	O	[0..*]	2
[	--- RESPONSE begin	X	[0..0]	
[	--- PATIENT begin	R	[1..1]	
[PID]	Patient Identification	R	[1..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
{{SAC}}	Specimen Container	O	[0..*]	13
{{	--- ORDER begin	O	[0..*]	
ORC	Common Order	R	[1..1]	4
{{TQ1}}	Timing/Quantity	RE	[0..1]	4
[OBR]	Observation Request	R	[1..1]	4
}}	--- ORDER end			
}	--- SPECIMEN end			
]	--- PATIENT end			
]	--- RESPONSE end			

1405 MSH-9 - Message Type (MSG) shall have its three components respectively valued to "ORL", "O34" and "ORL\_O34".

This message never carries the RESPONSE segment group. It is therefore limited to the first two or three segments.

### 3.4.5.3 Multiple Orders for a Single Container/Specimen (OML^O35, ORL^O36)

#### 1410 3.4.5.3.1 Trigger Events

OML (O35): Work order sent by the Order Filler.

ORL (O36): Acknowledgement of the Work Order sent by the Automation Manager.

1415 The trigger event for this message is any change to a laboratory order. Such changes include submission of new orders, cancellations, updates, etc., where multiple orders are associated with a single container of a specimen.

Notes HL7 V2.5 Chapter 4 describes “The trigger event for this message is any change to a laboratory order. Such changes include submission of new orders, cancellations, updates, etc., where multiple orders are associated with a single sample which may be carried in a multiple container”. This is same as OML^O33, and it seems a miss of typing.

### 3.4.5.3.2 Message Semantics

1420 Refer to the HL7 standard for the OML message of HL7 2.5 Chapter 4 and the general message semantics.

In addition, when the Order Filler sends a new work order to the Automation Manager, ORC-1 “Order Control Code” is valued with “NW”. When the work order is canceled, ORC-1 is valued with “CA”. The correction of the work order uses value “RP”.

1425 The OBX segments are used to convey the patient’s previous results, as well as some observation provided by the Order Placer or by the Order Filler, such as: blood pressure, patient’s temperature, specimen collection volume, etc.

**Table 3.4.5.3.2-1: OML^O35**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[	--- PATIENT begin	O	[0..1]	
PID	Patient identification	R	[1..1]	3
[ PV1 ]	Patient visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
{	--- CONTAINER begin	R	[1..*]	
SAC	Specimen Container	R	[1..1]	13
{	--- ORDER begin	R	[1..*]	
ORC	Common order	R	[1..1]	4
[ {TQ1} ]	Timing/Quantity Order Sequence	RE	[0..1]	4
[	--- OBSERVATION REQUEST begin	O	[0..1]	
OBR	Observation Request	R	[1..1]	4
[ TCD ]	Test Code Details	O	[0..1]	13
[ {OBX} ]	Additional specimen characteristics	O	[0..*]	7
{	--- PRIOR RESULT begin	O	[0..*]	
[ PV1 ]	Patient Visit	R	[1..1]	3
[ ORC ]	Common order – prior result	O	[0..1]	4
OBR	Order detail – prior result	R	[1..1]	4
{OBX}	Observation/Result - prior result	R	[1..*]	7
}	--- PRIOR RESULT end			
]	--- OBSERVATION REQUEST end			

Segment	Meaning	Usage	Card.	HL7 chapter
}	--- ORDER end			
}	--- CONTAINER end			
}	--- SPECIMEN end			

- 1430 Field MSH-9 – Message Type shall have its three components valued as follows:  
OML^O35^OML\_O35

The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

1435

Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 “Patient Class” (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 “U”, which stands for “patient class unknown”

1440

**Table 3.4.5.3.2-2: ORL^O36**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R		2
MSA	Message Acknowledgement	R		2
[ {ERR} ]	Error	O		2
[	--- RESPONSE begin	X	[0..0]	
[	--- PATIENT begin	R	[1..1]	
[ PID ]	Patient Identification	O	[0..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
{	--- CONTAINER begin	R	[1..*]	
SAC	Specimen Container	R	[1..1]	13
[ {	--- ORDER begin	O	[0..*]	
ORC	Common Order	R	[1..1]	4
[ {TQ1} ]	Timing/Quantity	RE	[0..1]	4
[ OBR ]	Observation Request	R		4
}]	--- ORDER end			
}	--- CONTAINER end			
}	--- SPECIMEN END			
]	--- PATIENT end			
]	--- RESPONSE end			

- 1445 Field MSH-9 – Message Type shall have its three components valued as follows:  
ORL^O36^ORL\_O36

This message never carries the RESPONSE segment group. It is therefore limited to the first two or three segments.

### 3.4.5.3.3 OBR Segment

1450 All fields are optional except those listed in table below.

**Table 3.4.5.3.3-3: OBR Segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	O	[0..1]		00237	Set ID – OBR
2	22	EI	R	[1..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	X	[0..0]		00241	Observation Date/Time #
8	26	TS	X	[0..0]		00242	Observation End Date/Time #
9	20	CQ	X	[0..0]		00243	Collection Volume *
10	250	XCN	O	[0..*]		00244	Collector Identifier *
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	R	[1..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	X	[0..0]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	C	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	X	[0..0]	0123	00258	Result Status +
26	400	PRL	X	[0..0]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	O	[0..*]		00260	Result Copies To
29	200	EIP	X	[0..0]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
31	250	CE	O	[0..1]		00263	Reason for Study
32	200	NDL	O	[0..1]		00264	Principal Result Interpreter +
33	200	NDL	O	[0..1]		00265	Assistant Result Interpreter +

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
34	200	NDL	O	[0..1]		00266	Technician +
35	200	NDL	O	[0..1]		00267	Transcriptionist +
36	26	TS	O	[0..1]		00268	Scheduled Date/Time +
37	4	NM	O	[0..1]		01028	Number of Sample Containers *
38	250	CE	O	[0..1]		01029	Transport Logistics of Collected Sample *
39	250	CE	O	[0..1]		01030	Collector's Comment *
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
44	250	CE	O	[0..1]	0088	00393	Procedure Code
45	250	CWE	O	[0..1]	0340	01316	Procedure Code Modifier
46	250	CE	O	[0..1]	0411	01474	Placer Supplemental Service Information
47	250	CE	O	[0..1]	0411	01475	Filler Supplemental Service Information
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.
49	2	IS	O	[0..1]	0507	01647	Result Handling

1455 OBR-2 Placer Order Number shall be reflected in a test result (LAB-5:OUL message), and it is used in order that Order Filler or Order Placer use it to pull out the corresponding order record.

OBR-3 If Filler Order Number present, it should be filled in.

**3.4.5.3.4 TCD Segment**

1460 All fields are optional except those listed in table below.

**Table 3.4.5.3.4-1: TCD Segment**

SEQ	LE N	DT	Usage	Card.	TBL #	ITEM#	Element name
1	250	CE	R	[1..1]		00238	Universal Service Identifier
2	20	SN	O	[0..1]		01420	Auto-Dilution Factor
3	20	SN	O	[0..1]		01421	Rerun Dilution Factor
4	20	SN	O	[0..1]		01422	Pre-Dilution Factor
5	20	SN	O	[0..1]		01413	Endogenous Content of Pre-Dilution Diluent
6	1	ID	O	[0..1]	0136	01416	Automatic Repeat Allowed
7	1	ID	O	[0..1]	0136	01424	Reflex Allowed
8	250	CE	O	[0..1]	<a href="#">0389</a>	01425	Analyte Repeat Status

**3.4.5.4 Expected Action**

1465 If the OML message of the Order Control Code NW is received from Order Filler, the Automation Manager will receive and register the order information, then it will transmit the result either “Accept” or “Reject” to Order Filler by the ORL message.

1470 If the OML message of the Order Control Code CA is received from Order Filler, Automation Manager will cancel the existing previous order information, and will not try to schedule or execute the command. Moreover, the command that has already started at the Automation Manager is not canceled. The result either Accept or Reject is transmitted to Order Filler by the ORL message.

1475 Automation Manager will change and register record of the command, if the OML message of the Order Control Code RP is received from Order Filler. However, Automation Manager does not change the command that has already started. The result either Accept or Reject is transmitted to Order Filler by the ORL message.

**3.5 Test Results Management (LAB-5)**

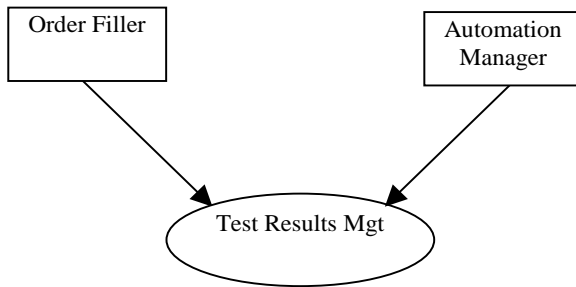
This section corresponds to transaction LAB-5 of IHE Laboratory Technical Framework. The actors using this transaction are the Order Filler and the Automation Manager.

**1480 3.5.1 Scope**

This transaction is used when Automation Manager transmits test results to Order Filler.

**3.5.2 Use Case Roles**





**Actor:** Order Filler

1485 **Role:** The Order Filler manages the test results notified by the Automation Manager.

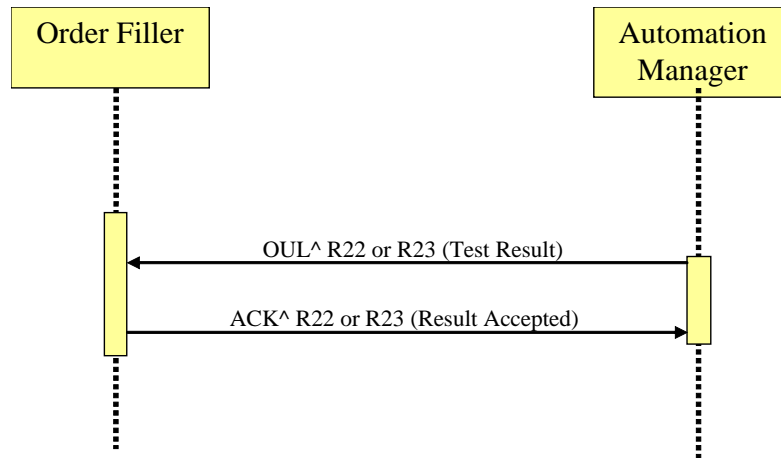
**Actor:** Automation Manager

**Role:** Handles the preprocessing and the analysis processing to fulfill the Work Order, performs the technical validation and sends the results technically validated to the Order Filler.

### 3.5.3 Referenced Standards

1490 HL7 Version 2.5--mainly referred to in Chapter 7.

### 3.5.4 Interaction Diagrams



**Figure 3.5.4-1: Unsolicited Observation Message from Automation Manager**

### 3.5.5 Messages Static Definitions

#### 1495 3.5.5.1 Trigger Events

OUL (R22 or R23): Automation Manager transmits test results.

The use of R22 is recommended when transferring multiple results related to a specimen from a patient.

1500 The use of R23 is recommended when transferring multiple results related to one or more specific containers with one or more specimens from a patient.

The use of R24 is deprecated, since this HL7 message structure is ambiguous. OUL^R24 can be viewed in:

[ftp://ftp.ihe.net/Laboratory/Tech\\_Framework/V2/ihe\\_lab\\_TF\\_2.0\\_Vol2\\_FT\\_2006-12-04.doc](ftp://ftp.ihe.net/Laboratory/Tech_Framework/V2/ihe_lab_TF_2.0_Vol2_FT_2006-12-04.doc)

1505 ACK (R22 or R23): Order Filler response acknowledgements.

### 3.5.5.2 Message Semantics (R22)

Refer to HL7 2.5 Chapter 7, section 7.3.7 for the general semantics of this message structure.

**Table 3.5.5.2-1: OUL^R22**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[PID]	Patient Identification	RE	[0..1]	3
[PV1]	Patient Visit	O	[0..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen information	R	[1..1]	7
[ { OBX } ]	Observation Result (for Specimen)	O	[0..*]	7
[ {	--- CONTAINER begin	0	[0..*]	
SAC	Container information	R	[1..1]	13
[ INV ]	Detailed Substance information (e.g., id, lot, manufacturer, ... of QC specimen)	O	[0..1]	13
}]	--- CONTAINER end			
{	--- ORDER begin	R	[1..*]	
OBR	Observation Order	R	[1..1]	7
[ ORC ]	Common Order	O	[0..1]	4
[ {NTE} ]	Comment on the Work Order	O	[0..*]	2
[ {	--- RESULT begin	O	[0..*]	
OBX	Observation Result	R	[1..1]	7
[ TCD ]	Test Code Detail	O	[0..1]	13
[ {SID} ]	Substance Identifier (e.g., reagents used for testing)	O	[0..*]	13
[ {NTE} ]	Notes and comments	O	[0..*]	
}]	--- RESULT end			
}	--- ORDER end			
}	--- SPECIMEN end			

1510

The carrier information in the case of notifying the test results of a patient's sample uses SAC.

**Table 3.5.5.2-2: ACK^R22**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2

Segment	Meaning	Usage	Card.	HL7 chapter
[ERR]	Error	O	[0..1]	2

1515 Field MSH-9 – Message Type shall have its three components valued as follows:  
OUL^R22^OUL\_R22

### 3.5.5.3 Message Semantics (R23)

Refer to HL7 2.5 Chapter 7, section 7.3.8 for the general semantics of this message structure.

1520

**Table 3.5.5.3-1: OUL^R23**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[PID]	Patient Identification	RE	[0..1]	3
[PV1]	Patient Visit	O	[0..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen information	R	[1..1]	7
[ { OBX } ]	Observation Result (for Specimen)	O	[0..*]	7
{	--- CONTAINER begin	R	[1..*]	
SAC	Container information	R	[1..1]	13
[ INV ]	Detailed Substance information (e.g., id, lot, manufacturer, ... of QC specimen)	O	[0..1]	13
{	--- ORDER begin	R	[1..*]	
OBR	Observation Order	R	[1..1]	7
[ ORC ]	Common Order	O	[0..1]	4
[ { NTE } ]	Comment on the Work Order	O	[0..*]	2
[ {	--- RESULT begin	O	[0..*]	
OBX	Observation Result	R	[1..1]	7
[ TCD ]	Test Code Detail	O	[0..1]	13
[ { SID } ]	Substance Identifier (e.g., reagents used for testing)	O	[0..*]	13
[ { NTE } ]	Notes and comments	O	[0..*]	
}]	--- RESULT end			
}	--- ORDER end			
}	--- CONTAINER end			
}	--- SPECIMEN end			

Field MSH-9 – Message Type shall have its three components valued as follows:  
OUL^R23^OUL\_R23

1525 The carrier information in the case of notifying the test results of a patient's sample uses SAC.

Refer to HL7 Chapter 13 for INV, SID segments and refer to HL7 Chapter 7 for CTI segment.

**Table 3.5.5.3-2: ACK^R23**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ERR]	Error	O	[0..1]	2

- 1530 Field MSH-9 - Message Type (MSG) shall have its two first components respectively valued to "OUL" and "R23".

Refer to HL7 Chapter 13 for INV, SID segments and refer to HL7 Chapter 7 for CTI segment.

### 3.5.5.4 Expected Action

- 1535 The Automation Manager notifies test results with the OUL message to the Order Filler. The Order Filler accepts and registers information, and responds to the Automation Manager with the ACK message.

### 3.5.5.5 OBR Segment

All fields are optional except those listed in table below.

1540

**Table 3.5.5.5-1: OBR segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	O	[0..1]		00237	Set ID – OBR
2	22	EI	RE	[0..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	RE	[0..1]		00241	Observation Date/Time #
8	26	TS	RE	[0..1]		00242	Observation End Date/Time #
9	20	CQ	O	[0..1]		00243	Collection Volume *
10	250	XCN	O	[0..*]		00244	Collector Identifier *
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	R	[1..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	C	[0..1]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	C	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	R	[1..1]	0123	00258	Result Status +
26	400	PRL	C	[0..1]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
28	250	XCN	O	[0..*]		00260	Result Copies To
29	200	EIP	C	[0..1]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
31	250	CE	O	[0..1]		00263	Reason for Study
32	200	NDL	O	[0..1]		00264	Principal Result Interpreter +
33	200	NDL	O	[0..1]		00265	Assistant Result Interpreter +
34	200	NDL	O	[0..1]		00266	Technician +
35	200	NDL	O	[0..1]		00267	Transcriptionist +
36	26	TS	O	[0..1]		00268	Scheduled Date/Time +
37	4	NM	O	[0..1]		01028	Number of Sample Containers *
38	250	CE	O	[0..1]		01029	Transport Logistics of Collected Sample *
39	250	CE	O	[0..1]		01030	Collector's Comment *
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
44	250	CE	O	[0..1]	0088	00393	Procedure Code
45	250	CWE	O	[0..1]	0340	01316	Procedure Code Modifier
46	250	CE	O	[0..1]	0411	01474	Placer Supplemental Service Information
47	250	CE	O	[0..1]	0411	01475	Filler Supplemental Service Information
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.
49	2	IS	O	[0..1]	0507	01647	Result Handling

All field data should reflect LAB-4 transaction's OBR, except:

**OBR-26 Parent Result (PRL)**

This field is used to report spawned orders in microbiology. See section 3.11 for detailed specification of usage.

1545

**OBR-29 Parent (EIP)**

This field is used to report spawned orders in microbiology. See section 3.11 for detailed specification of usage.

**3.5.5.6 TCD Segment**

1550 All fields are optional except those listed in table below.

**Table 3.5.5.6-1: TCD segment**

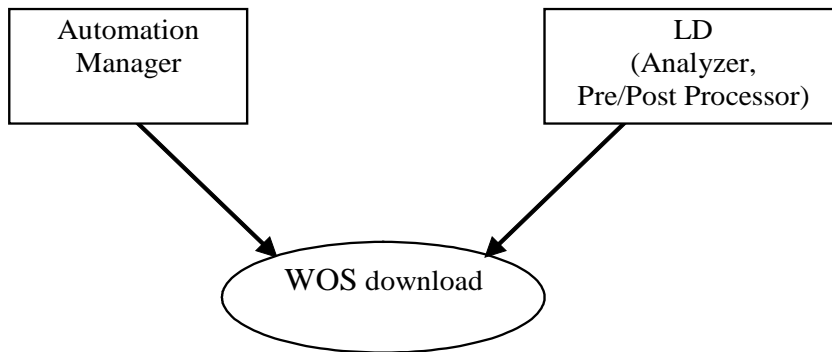
SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	250	CE	R	[1..1]		00238	Universal Service Identifier

1555 **3.6 Work Order Step Download to LD (LAB-21)**

**3.6.1 Scope**

1560 This transaction is used between an Automation Manager and a Laboratory Device working in download mode. It enables the AM to issue a new WOS to the LD, or cancel or modify an existing WOS previously sent to the LD. Modification may also be achieved by combining cancellation and sending of a new WOS.

**3.6.2 Use Case Roles**



**Actor:** Automation Manager

1565 **Role:** Translates a Work Order into a series of WOS assigned to the LDs. Downloads a WOS related to a specimen to the appropriate LD.

**Actor:** (LD) Pre/Post-processor, Analyzer

**Role:** Performs the WOS on the specimen

**3.6.3 Referenced Standard**

HL7 v2.5, Chapter 4

1570 **3.6.4 Interaction Diagram**

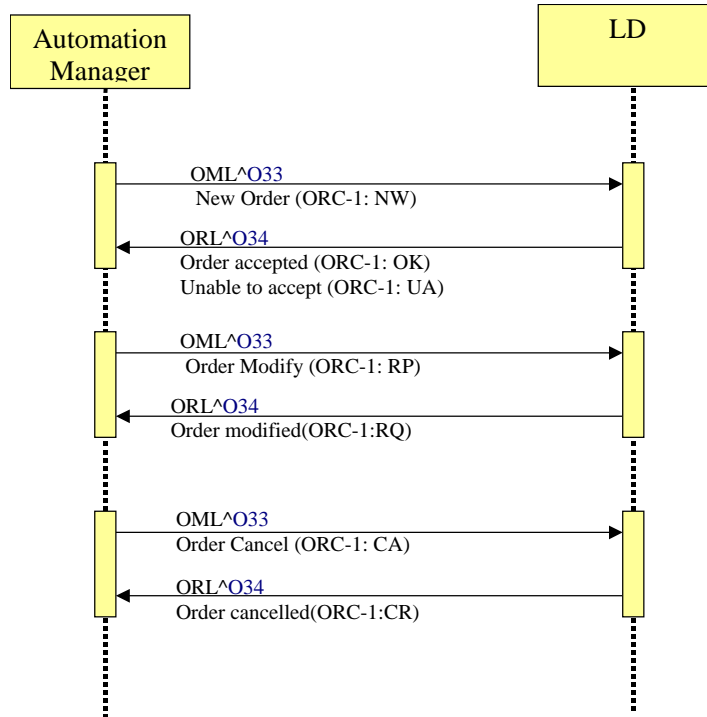


Figure 3.6.4-1: WOS management on LD in download mode

### 3.6.5 Message Static Definitions

1575 This transaction contains the messages used to download a Work Order Step (WOS) from the Automation Manager to the Analyzer or Pre/Post-processor. It includes “new WOS”, “update WOS”, “cancel WOS” and the related application acknowledgements.

### 3.6.6 Trigger Events

OML (O33): Event on WOS sent by the Automation Manager.

ORL (O34): Acknowledgement sent by the LD.

### 1580 3.6.7 Message Semantics

Table 3.6.7-1: OML^O33

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
[ PV1 ]	Patient Visit	RE	[0..1]	3
]	--- PATIENT end			
{	--- SPECIMEN begin	R	[1..1]	
SPM	Specimen	R	[1..1]	7
[[SAC]]	Specimen Container	O	[0..1]	
{	--- ORDER begin	R	[1..1]	



Segment	Meaning	Usage	Card.	HL7 chapter
ORC	Common Order (for one battery)	R	[1..1]	4
[[TQ1]]	Timing Quantity	RE	[0..1]	4
	--- OBSERVATION REQUEST begin	R	[1..1]	
OBR	Observation Request	R	[1..1]	4
[TCD]	Test Code Details	O	[0..1]	13
{	--- OBSERVATION begin	O	[0..*]	
OBX	Observation Result	R	[1..*]	7
[ TCD ]	Test Code Detail	O	[0..*]	13
[[ NTE ]]	Notes and Comments (for Results)	O	[0..*]	2
}}	--- OBSERVATION end			
[ {	--- PRIOR RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3
{	--- ORDER PRIOR begin	R	[1..*]	
ORC	Common order – prior result	R	[1..1]	4
OBR	Order detail – prior result	R	[1..1]	4
{	--- OBSERVATION PRIOR begin	R	[1..*]	
OBX	Observation/Result – prior result	R	[1..*]	
[[NTE]]	Comment of the result	C	[0..*]	2
}	--- OBSERVATION PRIOR end			
}	--- ORDER PRIOR end			
}]	--- PRIOR RESULT end			
	--- OBSERVATION REQUEST end			
}	--- ORDER end			
}	--- SPECIMEN end			

MSH-9 - Message Type (MSG) shall have its three components respectively valued to

1585 "OML", "O33" and "OML\_O33"

SPM-11 Specimen Role (CWE) in SPM segment shall be coded "Q" (Control specimen) in the case of a QC AWOS.

The PRIOR RESULT segment group provides the prior results obtained for the same patient.

1590 Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory.

1595 The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 "Patient Class" (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 "U", which stands for "patient class unknown".

1600 The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field “Order Control” populated with “PR” (Prior results).

Some LD need ‘Observation OBX,TCD,NTE segments’ (ex: analyzer). Therefore, the message carries optional OBSERVATION segment group to provide the analyzer with results related to the tests to be performed.

1605

**Table 3.6.7-2: ORL^O34**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[[ERR]]	Error	O	[0..*]	2
[	--- RESPONSE begin	O	[0..1]	
[	--- PATIENT begin	R	[1..1]	
[PID]	Patient Identification	R	[1..1]	3
{	--- SPECIMEN begin	R	[1..*]	
SPM	Specimen	R	[1..1]	7
[[SAC]]	Specimen Container	O	[0..*]	13
[[	--- ORDER begin	O	[0..*]	
ORC	Common Order	R	[1..1]	4
[[TQ1]]	Timing/Quantity	RE	[0..1]	4
[OBR]	Observation Request	R	[1..1]	4
]]	--- ORDER end			
}	--- SPECIMEN end			
]	--- PATIENT end			
]	--- RESPONSE end			

MSH-9 - Message Type (MSG) shall have its three components respectively valued to "ORL", "O34" and “ORL\_O34”.

**3.6.8 Expected Actions**

1610 If the OML message with the Order Control Code NW is received from the Automation Manager, the LD will receive and register the order information, then it will transmit the result either “Accept” or “Reject” to the Automation Manager in an ORL message.

**3.6.9 OBR Segment**

All fields are optional except those listed in table below.

1615

**Table 3.6.9-1: OBR Segment**

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM#	Element name
2	22	EI	R	[1..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM#	Element name
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	X	[0..0]		00241	Observation Date/Time #
8	26	TS	X	[0..0]		00242	Observation End Date/Time #
9	20	CQ	X	[0..0]		00243	Collection Volume *
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	R	[1..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	X	[0..0]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	C	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	X	[0..0]	0123	00258	Result Status +
26	400	PRL	X	[0..0]		00259	Parent Result +
27	200	TQ	X	[0..0]		00221	Quantity/Timing
29	200	EIP	X	[0..0]		00261	Parent
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.

1620

### 3.6.10 TCD Segment

**Table 3.6.10-1: TCD Segment**

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM#	Element name
1	250	CE	R	[1..1]		00238	Universal Service Identifier
2	20	SN	O	[0..1]		01420	Auto-Dilution Factor
3	20	SN	O	[0..1]		01421	Rerun Dilution Factor
4	20	SN	O	[0..1]		01422	Pre-Dilution Factor
5	20	SN	O	[0..1]		01413	Endogenous Content of Pre-Dilution Diluent
6	1	ID	O	[0..1]	0136	01416	Automatic Repeat Allowed
7	1	ID	O	[0..1]	0136	01424	Reflex Allowed
8	250	CE	O	[0..1]	<a href="#">0389</a>	01425	Analyte Repeat Status

1625

Note: Universal Service Identifier is a copy of OBR-4.

### 3.7 WOS Query (LAB-22)

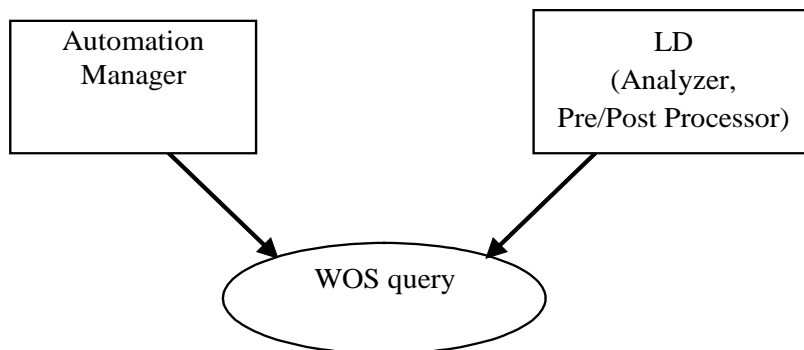
1630 This transaction is used between an Automation Manager and a Laboratory Device working in query mode. It enables the AM to issue a new WOS to the LD, or cancel or modify an existing WOS previously sent to the LD. Modification may also be achieved by combining cancellation and sending of a new WOS.

1635 This transaction is used by the LD to get the WOS to perform for each specimen by querying the Automation Manager after specimen recognition. The transaction provides a query for multiple specimens and the reply will carry zero or one container and one WOS for each specimen. The Automation Manager and the LD preserve the conformity between the specimen and the WOS by checking the Specimen Information (Specimen ID and the like) within the message.

#### 3.7.1 Scope

1640 This transaction is used by the general use case "Query for the WOS after specimen arrival on the LD" It is used by the Automation Manager (Laboratory Automation System) and the LD which supports "Query Mode".

#### 3.7.2 Use Case Roles



**Actor:** Automation Manager

1645 **Role:** Manages the Work Orders and WOS. Responds with the appropriate WOS to a query from the LD.

**Actor:** (LD) Pre/Post-processor, Analyzer

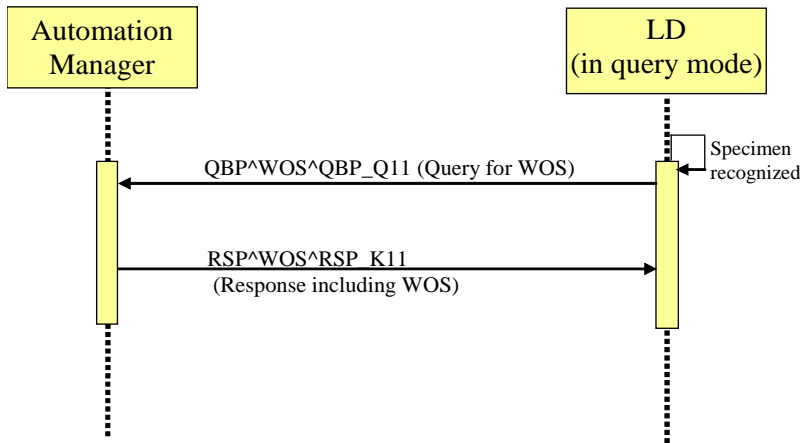
**Role:** Queries the Automation Manager for a WOS related to the specimen, and receives the WOS as the response.

#### 3.7.3 Referenced Standard

1650 HL7 version 2.5:

- Chapter5: "Query" --> QBP and RSP messages
- Chapter5: "Query" --> QPD, RCP and QAK segments

### 3.7.4 Interaction Diagram



1655

### 3.7.5 Message Static Definitions

After the LD working in query mode recognizes one or more specimens, the LD sends "WOS Query Message"(QBP^WOS^QBP\_Q11) with one or more Specimen IDs or other IDs to the Automation Manager.

1660 The Automation Manager replies with the response message (RSP^WOS^RSP\_K11) containing one or more WOS for each specimen identified in the query.

#### 3.7.5.1 Trigger Events

QBP(Q11) : Query for the WOS sent by the LD.

RSP(K11) : Response including the WOS sent by the Automation Manager.

#### 1665 3.7.5.2 Message Semantics

**Table 3.7.5.2-1: QBP^WOS^QBP\_Q11**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[[SFT]]	Software Segment	O	[0..*]	2
QPD	Query Parameter Definition	R	[1..1]	5
RCP	Response Control Parameter	R	[1..1]	5
[DSC]	Continuation Pointer	O	[0..1]	2

MSH-9 - Message Type (MSG) shall have its two first components respectively valued to "QBP" and "Q11".

1670

**Table 3.7.5.2-2: RSP^WOS^RSP\_K11**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[[SFT]]	Software Segment	O	[0..*]	2

Segment	Meaning	Usage	Card.	HL7 chapter
MSA	Message Acknowledgement	R	[1..1]	2
[ERR]	Error	O	[0..1]	2
QAK	Query Acknowledgement	R	[1..1]	5
QPD	Query Parameter Definition	R	[1..1]	5
{	--- SPECIMEN begin	C	[0..*]	
SPM	Specimen	R	[1..1]	7
[[OBX]]	Observation related to specimen	O	[0..*]	7
[[SAC]]	Specimen Container	RE	[0..1]	13
[	--- PATIENT begin	O	[0..1]	
PID	Patient Identification	R	[1..1]	3
[[OBX]]	Observation related to the patient	O	[0..*]	7
]	--- PATIENT end			
{	--- ORDER begin	R	[1..1]	
ORC	Common Order	R	[1..1]	4
[[TQ1]]	Timing/Quantity	RE	[0..1]	4
[	--- OBSERVATION REQUEST begin	O	[0..1]	
OBR	Observation Request	R	[1..1]	4
[ TCD ]	Test Code Details	O	[0..1]	13
[[	--- OBSERVATION begin	O	[0..*]	
OBX	Observation/Result	R	[1..*]	7
[ TCD ]	Test Code Detail	O	[0..*]	13
[[ NTE ]]	Notes and Comments (for Results)	O	[0..*]	2
]]	--- OBSERVATION end			
]	--- OBSERVATION REQUEST end			
[ {	--- PRIOR RESULT begin	O	[0..*]	
PV1	Patient Visit – previous result	R	[1..1]	3
{	--- ORDER PRIOR begin	R	[1*]	
ORC	Common order – previous result	R	[1..1]	4
OBR	Order detail – previous result	R	[1..1]	4
{	--- OBSERVATION PRIOR begin	R	[1..*]	
OBX	Observation/Result – previous result	R	[1..1]	
[ {NTE} ]	Comment of the result	C	[0..*]	2
}	--- OBSERVATION PRIOR end			
}	--- ORDER PRIOR end			
}]	--- PRIOR RESULT end			
}	--- ORDER end			
}	--- SPECIMEN end			

MSH-9 - Message Type (MSG) shall have its two first components respectively valued to "RSP" and "K11".

- 1675 SPM-11 Specimen Role (CWE) in SPM segment shall be coded "Q" (Control specimen) in the case of a QC AWOS.

If the query was not based on the specimen ID, the response shall contain a SAC segment.

- 1680 Some LD need 'Observation OBX,TCD,NTE segments' (ex: analyzer). Therefore, the response message carries optional OBSERVATION segment group to provide the analyzer with results related to the tests to be performed.

The SPECIMEN segment group is not present in case of an erroneous query (e.g., barcode read error).

- 1685 The PRIOR RESULT segment group provides the prior results obtained for the same patient. Segment PID is not provided in this segment group because it is the same patient, and the laboratory is not concerned by the fact that this patient might have had a different identification when the prior results were produced.

- 1690 Segment PV1, which is the first segment of the segment group PRIOR RESULT, is mandatory. The presence of this segment at this point in the message structure announces unambiguously a set of prior orders with related prior observations. The segment PV1 represents the patient visit (or encounter) during which these prior observations were produced. The only field mandatory in the segment PV1 is PV1-2 "Patient Class" (as shown in section 3.4). If the sender of this message does not know the patient class, it SHALL value the field PV1-2 "U", which stands for "patient class unknown".

- 1695 The ORC appearing in the PRIOR RESULT segment group is mandatory and SHALL have its first field "Order Control" populated with "PR" (Prior results).

### 3.7.5.3 Expected Actions

When specimen arrives on the LD which supports "Query Mode", the LD sends a QBP message to the Automation Manager to get WOS. This QBP message may have one or more Specimen IDs/Container IDs.

- 1700 The Automation Manager receives the QBP message and prepares the appropriate WOS by checking IDs contained in the QBP message. The Automation Manager returns the RSP message with WOS to the LD immediately. The LD receives WOS and performs processing for the specimen.

- 1705 Even if the Automation Manager could not prepare WOS for one or more IDs, the RSP message must have SPM segments of the same number as IDs contained in the QBP message. OBR/TCD segments can be omitted.

### 3.7.5.4 QPD Segment



Table 3.7.5.4-1: QPD segment

SE Q	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	60	CE	R	[1..1]		01375	Message Query Name
2	32	ST	R	[1..1]		00696	Query Tag
3	80	EIP	C	[0..*]		01756	SPM-2:Specimen Identification
4	80	EI	C	[0..*]		01331	SAC-3:Container Identification
5	80	EI	C	[0..1]		01337	SAC-10:Carrier Identification
6	80	NA	C	[0..1]		01338	SAC-11:Position in Carrier
7	80	EI	C	[0..1]		01340	SAC-13:Tray Identification
8	80	NA	C	[0..1]		01341	SAC-14:Position in Tray
9	250	CE	C	[0..*]		01342	SAC-15:Location

1710

**QPD-1 Message Query Name (CE)**, required.

Must be valued "WOS^Work Order Step^IHE\_LABTF"

**QPD-2 Query Tag (ST)**, required.

Unique to each query message instance.

1715

**QPD-3 Specimen Identification (EIP)**, conditional.

As for the 1st component "Placer Assigned Identifier"(EI), contains the placer assigned identifier and its assigning authority.

As for the 2nd component "Filler Assigned Identifier"(EI), contains the filler assigned identifier and its assigning authority.

1720

If this field is valued all other query fields shall be empty.

**QPD-4 Container Identification (EI)**, conditional.

Contains the identification of the container.

**QPD-5 Carrier Identification (EI)**, conditional.

Contains the identification of the carrier (also known as Rack).

1725

If this field is valued, then the field "QPD-6:Position in Carrier" shall also be valued.

If these 2 fields(QPD-5,6) are valued all other query fields shall be empty, with the possible exception of the Location field(QPD-9).

**QPD-6 Position in Carrier (NA)**, conditional.

Contains the positions of the specimen/aliquot on the carrier (rack).

1730

If this field is valued, then the field "QPD-5: Carrier Identification" shall also be valued.

**QPD-7 Tray Identification (EI)**, conditional.

Contains the identification of the Tray.

**QPD-8 Position in Tray (NA)**, conditional.

Contains the position of the carrier on the tray.

1735

**QPD-9 Location (CE)**, conditional.

Contains the physical location of the specimen.

This field cannot be valued in isolation, it must always be combined with the physical location/position of the specimen on either a carrier or a tray.

1740 This field shall never be used in combination with either the specimen identification or the container identification fields.

### 3.7.5.5 RCP Segment

**Table 3.7.5.5-1: RCP segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	1	ID	O	[0..1]	0091	00027	Query Priority
2	10	CQ	O	[0..1]	0126	00031	Quantity Limited Request
		NM					
		CE					
3	60	CE	O	[0..1]	0394	01440	Response Modality
7	256	ID	O	[0..*]		01594	Segment group inclusion

1745 **RCP-1 Query Priority(ID)**, optional.

Fixed to "I" (=Immediate). If no value is given, the default is "I".

**RCP-2 Quantity Limited Request(CQ)**, optional.

1750 As for the 1st component "Quantity"(NM), Number of Records which will be returned in each increment of the response. If no value is given, the entire response will be returned in a single increment.

As for the 2nd component "Units"(CE), "RD"(=Records) is always set. If no value is given, the default is RD.

**RCP-3 Response Modality(CE)**, optional.

Fixed to "R" (=Realtime). If no value is given, the default is "R".

1755 **RCP-7 Segment group inclusion(ID)**, optional.

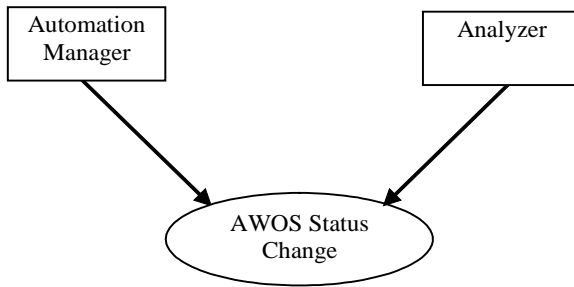
Specifies those optional segment groups which are to be included in the response. If this field is not valued, all segment groups will be included.

### 3.8 AWOS Status Change (LAB-23)

1760 **3.8.1 Scope**

This transaction is used by the Analyzer to send test results to the Automation Manager.

**3.8.2 Use Case Roles**



**Actor:** Automation Manager

1765 **Role:** Manages Analyzer in order to implement the AWOS. Receives the test results from Analyzer, performs technical validation, then sends the validated results to Order filler

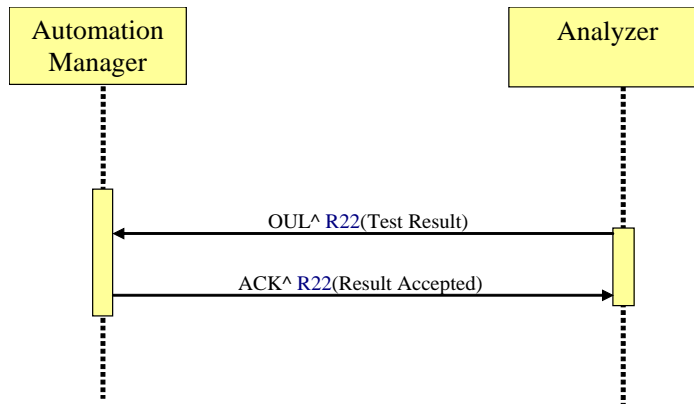
**Actor:** Analyzer

**Role:** Analyzes the specimen and outputs the test results.

**3.8.3 Referenced Standard**

1770 HL7 Version 2.5--mainly referred to in Chapter 7.

**3.8.4 Interaction Diagram**



**Figure 3.8.4-1: AWOS Status change**

**3.8.5 Message Static Definitions**

1775 This transaction contains the messages used by the Analyzer to report the status of an AWOS (such as “specimen arrived”, “first run failed”, “second run started”, “AWOS complete”...) and

to send the tests results when the AWOS is complete. It also includes the related applicative acknowledgements from the Automation Manager.

### 3.8.5.1 Trigger Events

1780 Analyzer sends test results. Automation Manager returns acknowledgement.

### 3.8.5.2 Message Semantics

**Table 3.8.5.2-1: OUL^R22**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
[PID]	Patient Identification	RE	[0..1]	3
[PV1]	Patient Visit	O	[0..1]	3
{	--- SPECIMEN begin	R	[1..1]	
SPM	Specimen information	R	[1..1]	7
[[ OBX ]]	Observation Result (for Specimen)	O	[0..*]	7
[[	--- CONTAINER begin	O	[0..1]	
SAC	Container information	R	[1..1]	13
[INV]	Detailed Substance information (e.g., id, lot, manufacturer, ... of QC specimen)	O	[0..1]	13
]]	--- CONTAINER end			
{	--- ORDER begin	R	[1..1]	
OBR	Observation Order	R	[1..1]	7
[ORC]	Common Order	O	[0..1]	4
[[NTE]]	Comment on the Work Order Step	O	[0..*]	2
[[	--- RESULT begin	O	[0..*]	
OBX	Observation Result	R	[1..1]	7
[TCD]	Test Code Detail	C <sup>*1</sup>	[0..1]	13
[[SID]]	Substance Identifier (e.g., reagents used for testing)	C <sup>*1</sup>	[0..*]	13
[[NTE]]	Notes and comments	O	[0..*]	
]]	--- RESULT end			
}	--- ORDER end			
}	--- SPECIMEN end			

1785

**Table 3.8.5.2-2: ACK^R22**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2

\*1 If it is patient sample, this is Optional. If it is a QC sample it is Mandatory if it is available.

Segment	Meaning	Usage	Card.	HL7 chapter
[ERR]	Error	O	[0..1]	2

MSH-9 - Message Type (MSG) shall have its three components respectively valued to "OUL", "R22" and "OUL\_R22".

1790 SPM-11 Specimen Role (CWE) in SPM segment shall be coded "Q" (Control specimen) in the case of a QC AWOS.

### 3.8.5.3 Expected Actions

Analyzer notifies Automation Manager of the test results using the OUL message . Automation Manager accepts and registers information, and responds to the Analyzer with the ACK message.

### 3.8.5.4 OBR Segment

1795 All fields are optional except those listed in table below.

**Table 3.8.5.4-1: OBR segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
2	22	EI	RE	[0..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number
4	250	CE	R	[1..1]		00238	Universal Service Identifier
5	2	ID	X	[0..0]		00239	Priority – OBR
6	26	TS	X	[0..0]		00240	Requested Date/Time
7	26	TS	RE	[0..1]		00241	Observation Date/Time #
8	26	TS	RE	[0..1]		00242	Observation End Date/Time #
11	1	ID	RE	[0..1]	0065	00245	Specimen Action Code *
12	250	CE	X	[0..0]		00246	Danger Code
13	300	ST	X	[0..0]		00247	Relevant Clinical Information
14	26	TS	X	[0..0]		00248	Specimen Received Date/Time *
15	300	SPS	X	[0..0]		00249	Specimen Source
16	250	XCN	R	[1..1]		00226	Ordering Provider
17	250	XTN	RE	[0..2]		00250	Order Callback Phone Number
18	60	ST	X	[0..0]		00251	Placer Field 1
19	60	ST	X	[0..0]		00252	Placer Field 2
20	60	ST	X	[0..0]		00253	Filler Field 1 +
21	60	ST	X	[0..0]		00254	Filler Field 2 +
22	26	TS	C	[0..1]		00255	Results Rpt/Status Chng - Date/Time +
23	40	MOC	X	[0..0]		00256	Charge to Practice +
24	10	ID	C	[0..1]	0074	00257	Diagnostic Serv Sect ID
25	1	ID	R	[1..1]	0123	00258	Result Status +
27	200	TQ	X	[0..0]		00221	Quantity/Timing

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
30	20	ID	X	[0..0]	0124	00262	Transportation Mode
40	250	CE	X	[0..0]		01031	Transport Arrangement Responsibility
41	30	ID	X	[0..0]	0224	01032	Transport Arranged
42	1	ID	X	[0..0]	0225	01033	Escort Required
43	250	CE	X	[0..0]		01034	Planned Patient Transport Comment
48	250	CWE	X	[0..0]	0476	01646	Medically Necessary Duplicate Procedure Reason.

All field data should reflect LAB-21,22 transaction's OBR.

1800 **3.8.5.5 TCD Segment**

All fields are optional except those listed in table below.

**Table 3.8.5.5-1: TCD segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	250	CE	R	[1..1]		00238	Universal Service Identifier

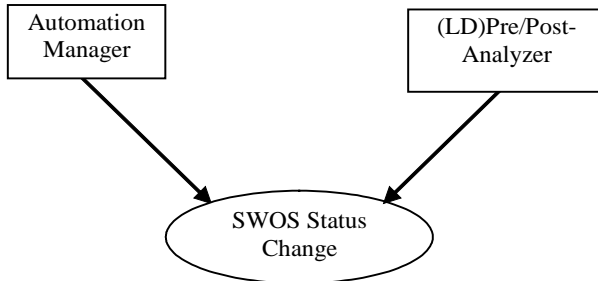
1805

### 3.9 SWOS Status Change (LAB-26)

#### 3.9.1 Scope

This transaction is used when the Pre/Post Processor transmits a Process Results to the Automation Manager.

1810 **3.9.2 Use Case Roles**



**Actor:** Automation Manager

**Role:** Manages the SWOS

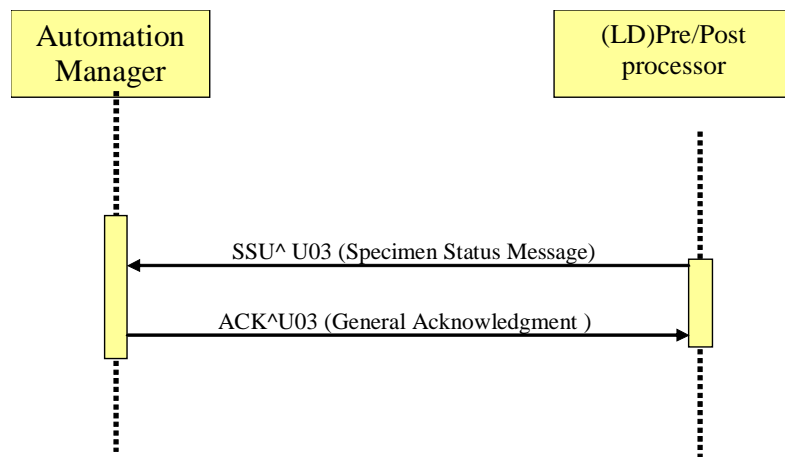
**Actor:** (LD) Pre/Post Processor

1815 **Role:** Manages the Pre/Post-analysis process on the specimen and generates a Process Result or Specimen Status Message.

#### 3.9.3 Referenced Standard

HL7 Version 2.5--mainly referred to in Chapter 7 and Chapter13.

#### 3.9.4 Interaction Diagram



1820

**Figure 3.9.4-1: Unsolicited SWOS Status Change from Pre/Post Processor**

### 3.9.5 Message Static Definitions

1825 This transaction contains the messages used by the Pre or Post-Processor to report all the status changes of the SWOS, and the related application acknowledgements. Status changes include: “specimen arrived”, “SWOS complete”, “SWOS failed”...

#### 3.9.5.1 Trigger Events

SSU (U03): Pre/Post Processor transmits a Specimen Status Update Message.

ACK (U03): Automation Manager sends the affirmative response.

#### 1830 3.9.5.2 Message Semantics

**Table 3.9.5.2-1: SSU^U03**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
EQU	Equipment Detail	R	[1..1]	13
{	--- SPECIMEN_CONTAINER begin	R	[1..1]	
SAC	Specimen Container Detail	R	[1..1]	13
{ [ OBX ] }	Additional specimen characteristics	O	[0..*]	7
[ {	--- SPECIMEN begin	O	[0..1]	
SPM	Specimen information	R	[1..1]	7
{ [ OBX ] }	Observation Result (for Specimen)	O	[0..*]	7
} ]	--- SPECIMEN end			
}	--- SPECIMEN_CONTAINER end			

**Table 3.9.5.2-2: ACK^U03**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message header	R	[1..1]	2
MSA	Message Acknowledgement	R	[1..1]	2
[ ERR ]	Error	O	[0..1]	2

1835

#### 3.9.5.3 Expected Actions

The Pre/Post Processor sends a Process Result using the SSU message to the Automation Manager. The Automation Manager accepts and registers the Process Result, and responds to the Pre/Post Processor using the ACK message.

1840

Note: The SSU message might appear too restrictive to meet future needs for carrying the output data of a SWOS, brought along by specific pre or post processing devices. If such a use case appears in the future for a specific device, alternative messages will be studied to extend this profile.



## 4 Real World Use Cases

### 1845 4.1 Guidelines

Each of the real world use cases in this section are to be considered as a template for handling a category of laboratory testing throughout all the transactions of the Laboratory Technical Framework. Only the major steps and interactions are described.

1850 Each use case is described by a storyboard that describes the complete workflow in chronological order, completed by an interaction diagram, and illustrated by the most significant messages of this workflow.

The message descriptions are abbreviated, to focus on the main points of interest.

For brevity, only some of the application acknowledgements are shown.

1855 The actors' names are abbreviated with their initials (OP, OF, AM, ORT). These abbreviations are also used in the MSH-3 (sending application) and MSH-5 (receiving application) fields.

All use cases assume that the placer order is related to a placer group number (ORC-4).

All tests are identified in OBX segments by their LOINC code when available.

Colors point out key information in the messages.

## 4.2 Two Hematology Batteries on a Blood Specimen

### 1860 4.2.1 Storyboard

This example corresponds to the use case described in Volume 1 as “Externally placed order with specimens unidentified or to be collected by the laboratory”. The specimen is not identified by the ordering care unit.

1865 Dr. Physician orders two batteries of tests on the same specimen: blood count and differential blood count.

#### **Human actors and organizations participating to the process:**

Assigning authority:	Abbeville Hospital
Placer:	Urology department
Filler:	Cytology laboratory
1870 Ordering facility:	Urology
Patient:	John Ill, Patient hospital identifier: 6543210, Patient visit number: 999888, class = inpatient
Orderer:	Dr. Uro
Placer order enterer:	Janet Nurse
1875 Specimen collector:	John Collect
Technician:	Marc Techos
Clinical expert:	Jane Cyto

#### **ID numbers used by the workflow:**

ID number	Value	Assigned by
Patient hospital ID	6543210	Admission office (ADT)
Patient visit number	9998888	Admission office (ADT)
Care unit order group	555	Urology department (OP)
Care unit order (1st battery)	9876543	Urology department (OP)
Care unit order (2nd battery)	9876544	Urology department (OP)
Laboratory order (1st battery) idem for work order	456	Cytology laboratory (OF)
Laboratory order (2nd battery) idem for work order	457	Cytology laboratory (OF)
Work Order Step Code (1st battery)	456	Cytology laboratory (AM)
Work Order Step Code (2nd battery)	457	Cytology laboratory (AM)
Specimen	456_1	Cytology laboratory (OF)

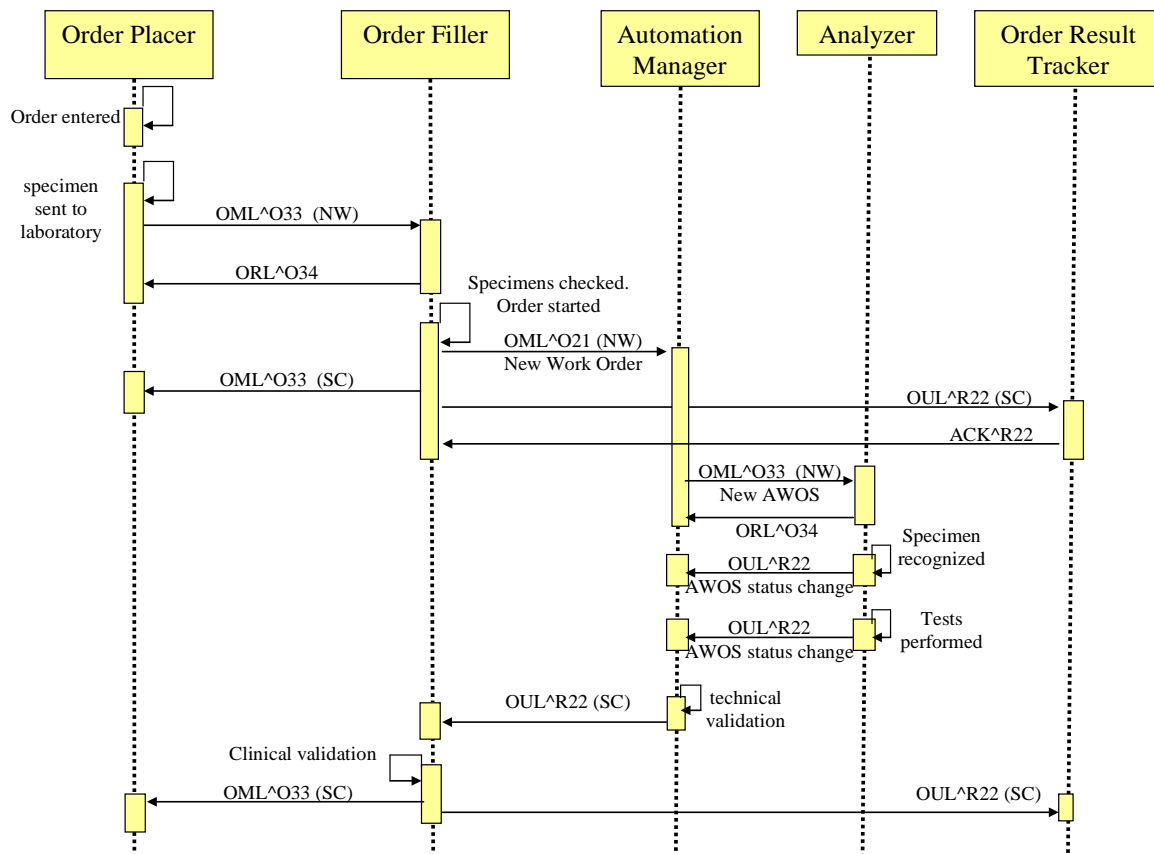
1880 **LAB-1 interaction:** The Care Unit collects a specimen related to an order for a blood count and a differential count, and sends the specimen to the chemistry laboratory. The Order Placer sends a message “new order” (NW) accompanying the specimen, to let the laboratory start the testing.

1885 **LAB-4, LAB-1 and LAB-3 interactions:** The laboratory checks the specimen and schedules the work. An identifier is assigned to the specimen by the Order Filler and the corresponding identification label is printed out. The Order Filler sends a unique work order to the Automation Manager. The Order Filler notifies both Order Placer and Order Result Tracker of the scheduled work.

**LAB-5, LAB-1 and LAB-3 interactions:** After technical validation by a laboratory technician (Marc Techos), the Automation Manager sends back all the observations to the Order Filler.

1890 **LAB-1 and LAB-3 interactions:** After clinical validation, the Order Filler notifies the results to the Order Result Tracker, and notifies the status change to the Order Placer.

### 4.2.2 Interaction Diagram



### 4.2.3 Messages

#### 1895 4.2.3.1 LAB-1 (OP → OF): Message “New order” with one Specimen

**A new placer order sent to the Order Filler:**

1900 MSH|^~\&|OP|Urology|OF|Cytology|200310060820||OML^O33^OML\_O33|001|T|2.5|||USA|EN  
 PID|1||6543210^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M  
 PV1|1|I|||||||9998888  
 SPM|1||BLD||P|||200310060735|||1  
 ORC|NW|9876543^Urology|555^Urology  
 |||200310060710|^NURSE^JANET|||Urology^^^^^FI^^UR01

```

1905 TQ1 | 1 | | | | | | | | | R
OBR | 1 | 9876543^Urology | | 85027^Hemogram and platelet count, automated^C4 |
| | | | ^COLLECT^JOHN | | | | | ^URO^^^^DR
ORC | NW | 9876544^Urology | | 555^Urology |
| | | | 200310060710 | ^NURSE^JANET | | | | | | | | | Urology^^^^^FI^^^UR01
1910 TQ1 | 1 | | | | | | | | | R
OBR | 1 | 9876544^Urology | | 85009^Differential WBC Count, buffy coat^C4 |
| | | | ^COLLECT^JOHN | | | | | ^URO^^^^DR
    
```

The related acknowledgement message isn't shown.

#### 4.2.3.2 LAB-4 (OF → AM): Message “New order”

1915 **A new work order is sent to the Automation Manager:**

```

MSH | ^~\& | OF | Cytology | AM | Automation | 200310060825 | | OML^O33^OML_O33 | 101 | T | 2.5 | | | | USA | | EN
PID | 1 | | 6543210^^^Abbeville Hospital^PI | | ILL^JOHN^^^^^L | | 19810101 | M
PV1 | 1 | I | | | | | | | | | | | | | 9998888
1920 SPM | 1 | 456_1^Cytology | | BLD | | | | | | P | | | | | | 200310060735 | 200310060821 | | | | | | 1
ORC | NW | | 555^Urology | | | | 200310060710 | ^NURSE^JANET | | | | | | | | | Urology^^^^^FI^^^UR01
TQ1 | 1 | | | | | | | | | R
OBR | 1 | 456^Cytology | | 85027^Hemogram and platelet count, automated^C4 |
| | | | ^COLLECT^JOHN | | | | | ^URO^^^^DR
ORC | NW | | 555^Urology | | | | 200310060710 | ^NURSE^JANET | | | | | | | | | Urology^^^^^FI^^^UR01
1925 TQ1 | 1 | | | | | | | | | R
OBR | 1 | 457^Cytology | | 85009^Differential WBC Count, buffy coat^C4 |
| | | | ^COLLECT^JOHN | | | | | ^URO^^^^DR
    
```

1930 **Acknowledgement sent by the Automation Manager:**

```

MSH | ^~\& | AM | Automation | OF | Cytology | 200310060826 | | ORL^O34^ORL_O34 | 301 | T | 2.5 | | | | USA | | EN
MSA | AA | 101
1935 PID | 1 | | 6543210^^^Abbeville Hospital^PI | | ILL^JOHN^^^^^L | | 19810101 | M
SPM | 1 | 456_1^Cytology | | BLD | | | | | | P | | | | | | 200310060735 | 200310060821 | | | | | | 1
ORC | OK | | 555^Urology | SC | | | | 200310060710 | ^NURSE^JANET | | | | | | | | | Urology^^^^^FI^^^UR01
TQ1 | 1 | | | | | | | | | R
1940 OBR | 1 | 456^Cytology | | 85027^Hemogram and platelet count, automated^C4 |
| | | | ^COLLECT^JOHN | S | | | | | ^URO^^^^DR
ORC | OK | | 555^Urology | SC | | | | 200310060710 | ^NURSE^JANET | | | | | | | | | Urology^^^^^FI^^^UR01
TQ1 | 1 | | | | | | | | | R
1945 OBR | 1 | 457^Cytology | | 85009^Differential WBC Count, buffy coat^C4 |
| | | | ^COLLECT^JOHN | S | | | | | ^URO^^^^DR
    
```

#### 4.2.3.3 LAB-1 (OF → OP): Message “Status changed”

The placer order has been assigned a filler order number, the specimen is available and identified by the laboratory:

```

1950 MSH | ^~\& | OF | Cytology | OP | Urology | 200310060825 | | OML^O33^OML_O33 | 108 | T | 2.5 | | | | USA | | EN
PID | 1 | | 6543210^^^Abbeville Hospital^PI | | ILL^JOHN^^^^^L | | 19810101 | M
PV1 | 1 | I | | | | | | | | | | | | | 9998888
SPM | 1 | 456_1^Cytology | | BLD | | | | | | P | | | | | | 200310060735 | 200310060821 | | Y | | | | | 1
ORC | SC | 9876543^Urology | | 555^Urology | IP | | | | 200310060710 | ^NURSE^JANET | | | | | | | | |
    
```

1955 Urology^^^^^FI^^UR01  
 TQ1|1| | | | | | | | |R  
 OBR|1| 9876543^Urology|456^Cytology|85027^Hemogram and platelet count, automated^C4|  
 | | | | | ^COLLECT^JOHN|P| | | | | ^URO^^^DR| | | | | | | | |I  
 1960 ORC|SC|9876544^Urology|555^Urology|IP| | | | | | | | |200310060710|^NURSE^JANET| | | | | | | | | |  
 Urology^^^^^FI^^UR01  
 TQ1|1| | | | | | | | |R  
 OBR|1| 9876544^Urology|457^Cytology|85009^Differential WBC Count, buffy coat^C4|  
 | | | | | ^COLLECT^JOHN|P| | | | | ^URO^^^DR| | | | | | | | |I  
 1965 The related acknowledgement message isn't shown.

#### 4.2.3.4 LAB-3 (OF->ORT): Message "New Order"

The Order Result Tracker is notified of the creation of the filler order by means of a result message:

1970 MSH|^~\&|OF|Cytology|ORT|200310060825|OUL^R22^OUL\_R22|122|T|2.5| | | | |USA|EN  
 PID|1|6543210^^Abbeville Hospital^PI|ILL^JOHN^^^L|19810101|M  
 PV1|1|I| | | | | | | | | | | | | |9998888  
 SPM|1|456\_1^Cytology|BLD| | | | | | | | | | | | | |200310060735|200310060821| |Y| | | | | |1  
 1975 OBR|1|9876543^Urology|456^Cytology|85027^Hemogram and platelet count, automated^C4|  
 | | | | | ^COLLECT^JOHN|P| | | | | ^URO^^^DR| | | | | | | | |I  
 ORC|SC|9876543^Urology|555^Urology|IP| | | | | | | | |200310060710|^NURSE^JANET| | | | | | | | | |  
 Urology^^^^^FI^^UR01  
 TQ1|1| | | | | | | | |R  
 1980 OBR|2|9876544^Urology|457^Cytology|85009^Differential WBC Count, buffy coat^C4|  
 | | | | | ^COLLECT^JOHN|P| | | | | ^URO^^^DR| | | | | | | | |I  
 ORC|SC|9876544^Urology|555^Urology|IP| | | | | | | | |200310060710|^NURSE^JANET| | | | | | | | | |  
 Urology^^^^^FI^^UR01  
 TQ1|1| | | | | | | | |R

#### 1985 Acknowledgement sent by the Order Results Tracker:

MSH|^~\&|ORT|OF|Cytology|200310060826|ACK^R22^ACK|401|T|2.5| | | | |USA|EN  
 MSA|AA|122

#### 1990 4.2.3.5 LAB-21 (AM-> Analyzer): New AWOS

MSH|^~\&|AM|Cytology|LD|Cytology|200506121348|OML^O33^OML\_O33|001|T|2.5| | | | |USA|EN  
 PID|1|6543210^^Abbeville Hospital^PI|ILL^JOHN^^^L|19810101|M  
 PV1|1|I| | | | | | | | | | | | | |9998888  
 SPM|1|456\_1|BLD| | | | | | | | | | | | | |200506121330| | | | | | | | |1  
 1995 ORC|NW|9876543^Urology| | | | | | | | |200506121315|66622^NURSE^JANET| | | | | | | | | |Urology  
 TQ1| | | | | | | | | |R  
 OBR|9876543|85027^Hemogram and platelet count, automated^C4| | | | | | | | | |14788^URO  
 ORC|NW|9876544^Urology| | | | | | | | |200506121315|66622^NURSE^JANET| | | | | | | | | |Urology  
 TQ1| | | | | | | | | |R  
 2000 OBR|9876544|85009^Differential WBC count, buffy coat^C4| | | | | | | | | |14788^URO

Acknowledgement sent by the Analyzer:

MSH|^~\&|LD|Cytology|AM|Cytology|200506121349|ORL^O34^ORL\_O34|101|T|2.5| | | | |USA|EN  
 MSA|AA|001  
 2005 PID|1|6543210^^Abbeville Hospital^PI|ILL^JOHN^^^L|19810101|M  
 PV1|1|I| | | | | | | | | | | | | |9998888  
 SPM|1|456\_1|BLD

2010 ORC | OK | 9876543^Urology | ||||| 200506121349  
 OBR | 9876543 | 85027^Hemogram and platelet count, automated^C4  
 ORC | OK | 9876544^Urology | ||||| 200506121349  
 OBR | 9876544 | 85009^Differential WBC count, buffy coat^C4

**4.2.3.6 LAB-23 (Analyzer → AM): Specimen for AWOS Arrived**

2015 MSH | ^~\& | LD | Cytology | AM | Cytology | 200506121400 | OUL^R22^OUL\_R22 | 102 | T | 2.5 | || | USA | | EN  
 PID | 1 | 6543210^^^Abbeville Hospital^PI | ILL^JOHN^^^^^L | 19810101 | M  
 PV1 | 1 | I | ||||| ||||| 9998888  
 SPM | 1 | 456\_1 | BLD  
 OBR | 9876543 | 85027^Hemogram and platelet count, automated^C4 | ||||| ||||| I  
 2020 ORC | SC | 9876543^Urology | ||||| 200506121400  
 OBR | 9876544 | 85009^Differential WBC count, buffy coat^C4 | ||||| ||||| I

Acknowledgement not shown.

**4.2.3.7 LAB-23 (Analyzer → AM): Tests Performed**

2025 MSH | ^~\& | LD | Cytology | AM | Cytology | 200506121410 | OUL^R22^OUL\_R22 | 102 | T | 2.5 | || | USA | | EN  
 PID | 1 | 6543210^^^Abbeville Hospital^PI | ILL^JOHN^^^^^L | 19810101 | M  
 PV1 | 1 | I | ||||| ||||| 9998888  
 SPM | 1 | 456\_1 | BLD  
 OBR | 9876543 | 85027^Hemogram and platelet count, automated^C4 | ||||| ||||| R  
 2030 ORC | SC | 9876543^Urology | ||||| 200506121410  
 OBX | 1 | NM | 11156-7^LEUKOCYTES^LN | 8.2 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 2 | NM | 11273-0^ERYTHROCYTES^LN | 4.08 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 3 | NM | 20509-6^HEMOGLOBIN^LN | 13.4 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 4 | NM | 20570-8^HEMATOCRIT^LN | 39.7 | 10\*3/mm3 | || | R | | 200506121410  
 2035 OBX | 5 | NM | 30428-7^MVC^LN | 97 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 6 | NM | 28539-5^MCH^LN | 33.0 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 7 | NM | 28540-3^MCHC^LN | 33.8 | 10\*3/mm3 | || | R | | 200506121410  
 OBX | 8 | NM | 11125-2^PLATELETS^LN | 220 | 10\*3/mm3 | || | R | | 200506121410  
 OBR | 9876544 | 85009^Differential WBC count, buffy coat^C4 | ||||| ||||| R  
 2040 ORC | SC | 9876544^Urology | ||||| 200506121410  
 OBX | 1 | NM | 23761-0^NEUTROPHILS/100 LEUKOCYTES^LN | 72 | % | || | R | | 200506121410  
 OBX | 2 | NM | 26450-7^EOSINOPHILS/100 LEUKOCYTES ^LN | 2 | % | || | R | | 200506121410  
 OBX | 3 | NM | 26478-8^LYMPHOCYTES/100 LEUKOCYTES ^LN | 20 | % | || | R | | 200506121410  
 OBX | 4 | NM | 26485-3^MONOCYTES/100 LEUKOCYTES ^LN | 6 | % | || | R | | 200506121410  
 OBX | 5 | NM | 30180-4^BASOPHILS/100 LEUKOCYTES ^LN | 0 | % | || | R | | 200506121410  
 2045

**4.2.3.8 LAB-5 (AM->OF): Message “New Results”**

The Automation Manager sends the final results for the work order:

2050 MSH | ^~\& | AM | Automation | OF | Urology | 200310060900 | OUL^R22^OUL\_R22 | 308 | T | 2.5 | || | USA | | EN  
 PID | 1 | 6543210^^^Abbeville Hospital^PI | ILL^JOHN^^^^^L | 19810101 | M  
 PV1 | 1 | I | ||||| ||||| 9998888  
 SPM | 1 | 456\_1^Cytology | BLD | ||||| P | ||||| 200310060735 | 200310060821 | | Y | ||||| 1  
 OBR | 1 | 456^Cytology | 85027^Hemogram and platelet count, automated^C4 |  
 | | | ^COLLECT^JOHN | P | | | ^URO^^^^DR |  
 | | | 200310060832 | | F | | | | &TECHOS&MARC^200310060833 |  
 2055 ORC | SC | | CM | | 200310060710 ^NURSE^JANET | | | | | Urology^^^^^FI^^^UR01  
 OBX | 1 | NM | 11156-7^LEUKOCYTES^LN | 8.2 | 10\*3/mm3 | 4-10 | N | | F | | 200310060830  
 OBX | 2 | NM | 11273-0^ERYTHROCYTES^LN | 4.08 | 10\*6/mm3 | 10-12 | N | | F | | 200310060830  
 OBX | 3 | NM | 20509-6^HEMOGLOBIN^LN | 13.4 | g/dL | 11.5-14.5 | N | | F | | 200310060830  
 OBX | 4 | NM | 20570-8^HEMATOCRIT^LN | 39.7 | % | 37-47 | N | | F | | 200310060830

2060 OBX|5|NM|30428-7^MCV^LN||97|fL|80-95|N||F|||200310060830  
 OBX|6|NM|28539-5^MCH^LN||33.0|pg|27-32|N||F|||200310060830  
 OBX|7|NM|28540-3^MCHC^LN||33.8|%|30-36|N||F|||200310060830  
 OBX|8|NM|11125-2^PLATELETS^LN||220|10\*9/L|150-400|N||F|||200310060830  
 2065 OBR|2|457^Cytology||85009^Differential WBC Count, buffy coat^C4|  
 |||^COLLECT^JOHN|P|||^URO^^^^DR  
 |||^200310060832||F|||^&TECHOS&MARC^200310060833  
 ORC|SC|||CM|||200310060710|^NURSE^JANET|||Urology^^^^^FI^^UR01  
 OBX|1|NM|23761-0^NEUTROPHILS/100 LEUKOCYTES^LN||72%|N||F|||200310060830  
 2070 OBX|2|NM|26450-7^EOSINOPHILS/100 LEUKOCYTES^LN||2%|N||F|||200310060830  
 OBX|3|NM|26478-8^LYMPHOCYTES/100 LEUKOCYTES^LN||20%|N||F|||200310060830  
 OBX|4|NM|26485-3^MONOCYTES/100 LEUKOCYTES^LN||6%|N||F|||200310060830  
 OBX|5|NM|30180-4^BASOPHILS/100 LEUKOCYTES^LN||0%|N||F|||200310060830

The related acknowledgement message isn't shown.

2075

**4.2.3.9 LAB-1 (OF->OP): Message "Status Changed"**

The clinical expert has performed the clinical validation at 09h29. The order is completed:

2080 MSH|^~\&|OF|Urology| OP|Urology|200310060930||OML^O33^OML\_O33|181|T|2.5|||USA||EN  
 PID|1||6543210^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M  
 PV1|1|I|||||9998888  
 SPM|1|456\_1^Cytology|BLD||||P||||200310060735|200310060821|Y||||1  
 ORC|SC|9876543^Urology||555^Urology|CM|||200310060710|^NURSE^JANET|||Urology^^^^^FI^^UR01  
 TQ1|1|||||R  
 2085 OBR|1|9876543^Urology|456^Cytology|85027^Hemogram and platelet count, automated^C4|  
 |||^COLLECT^JOHN|P|||^URO^^^^DR|||F|||^&CYTO&JANE^200310060929  
 ORC|SC|9876544^Urology||555^Urology|CM|||200310060710|^NURSE^JANET|||Urology^^^^^FI^^UR01  
 TQ1|1|||||R  
 2090 OBR|1|9876544^Urology|457^Cytology|85009^Differential WBC Count, buffy coat^C4|  
 |||^COLLECT^JOHN|P|||^URO^^^^DR|||F|||^&CYTO&JANE^200310060929

The related acknowledgement message isn't shown.

2095 **4.2.3.10 LAB-3 (OF->ORT): Message "Status Changed"**

The clinical expert has performed the clinical validation at 09h29. The order is completed. The results are final:

2100 MSH|^~\&|OF|Cytology|ORT||200310060931||OUL^R22^OUL\_R22|182|T|2.5|||USA||EN  
 PID|1||6543210^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M  
 PV1|1|I|||||9998888  
 SPM|1|456\_1^Cytology|BLD||||P||||200310060735|200310060821|Y||||1  
 OBR|1|9876543^Urology|456^Cytology|85027^Hemogram and platelet count, automated^C4|  
 |||^COLLECT^JOHN|P|||^URO^^^^DR|||F|||^&CYTO&JANE^200310060929  
 2105 ORC|SC|9876543^Urology||555^Urology|CM|||200310060710|^NURSE^JANET|||Urology^^^^^FI^^UR01  
 TQ1|1|||||R  
 OBX|1|NM|11156-7^LEUKOCYTES^LN||8.2|10\*3/mm3|4-10|N||F|||200310060830  
 OBX|2|NM|11273-0^ERYTHROCYTES^LN||4.08|10\*6/mm3|10-12|N||F|||200310060830  
 2110 OBX|3|NM|20509-6^HEMOGLOBIN^LN||13.4|g/dL|11.5-14.5|N||F|||200310060830  
 OBX|4|NM|20570-8^HEMATOCRIT^LN||39.7|%|37-47|N||F|||200310060830  
 OBX|5|NM|30428-7^MCV^LN||97|fL|80-95|N||F|||200310060830

```

2115 OBX|6|NM|28539-5^MCH^LN||33.0|pg|27-32|N|||F|||200310060830
OBX|7|NM|28540-3^MCHC^LN||33.8|%|30-36|N|||F|||200310060830
OBX|8|NM|11125-2^PLATELETS^LN||220|10*9/L|150-400|N|||F|||200310060830
OBR|2|9876544^Urology|457^Cytology|85009^Differential WBC Count, buffy coat^C4|
|||COLLECT^JOHN|P|||URO^^^^DR|
|||200310060929|||F|||&CYTO&JANE^200310060929
2120 ORC|SC|9876544^Urology||555^Urology|CM|||200310060710|^NURSE^JANET|||
Urology^^^^^FI^^^UR01
TQ1|1|||R
OBX|1|NM|23761-0^NEUTROPHILS/100 LEUKOCYTES^LN||72|%|N|||F|||200310060830
OBX|2|NM|26450-7^EOSINOPHILS/100 LEUKOCYTES^LN||2|%|N|||F|||200310060830
OBX|3|NM|26478-8^LYMPHOCYTES/100 LEUKOCYTES^LN||20|%|N|||F|||200310060830
2125 OBX|4|NM|26485-3^MONOCYTES/100 LEUKOCYTES^LN||6|%|N|||F|||200310060830
OBX|5|NM|30180-4^BASOPHILS/100 LEUKOCYTES^LN||0|%|N|||F|||200310060830
    
```

The related acknowledgement message isn't shown.



## 2130 4.3 Test on a Series of Specimens: Glucose Tolerance Study

### 4.3.1 Storyboard

This use case is in the context given by the first general use case presented in Volume 1 “3.1.1: Externally placed order with identified specimens”. The ordering care unit thus identifies the specimens.

2135 Dr. Physician orders one battery and provides a series of specimen collected at different times. The battery consists of one single test: glucose concentration on blood serum, repeated on a number of specimens, to be performed by the chemistry laboratory. The order is assumed to be part of a group of placer orders identified by the placer group number ‘666’.

2140 Glucose tolerance is ordered as a single battery requesting for glucose test on an unspecified number of blood serum drawn at different intervals, after initial glucose ingestion”. The SPM segments in the order message indicate the number of specimens, which can vary. The result consists of all the observation performed on each related individual specimen. All specimens produce results, except one unfortunately broken.

#### Human actors and organizations participating to the process:

2145 Assigning authority: Memphis Hosp.

Placer: Entero-gastric department

Filler: Chemistry laboratory

Ordering facility: Entero-gastric

2150 Patient: Adam Everyman Jr., account number: 12345 (check-digit 5 modulo 10),  
class = outpatient.

Orderer: Dr. Physician, phone number 821, ID number in the hospital 222222

Placer order enterer: Nancy Nurse, ID number 222221

Specimen collector: M. Bleeder, ID number 1234

Technician: Suzy Technician, ID number 333333

2155 Clinical expert: Jane Chemistry-Expert, ID number 444444

#### ID numbers used by the workflow:

ID number	Value	Assigned by
Patient ID	12345	Admission office (ADT)
Care unit order	12345678	Entero-gastric department (OP)
Care unit order group	666	Entero-gastric department (OP)
1 <sup>st</sup> specimen	123456781	Entero-gastric department (OP)
2 <sup>nd</sup> specimen	123456782	Entero-gastric department (OP)
3 <sup>rd</sup> specimen	123456783	Entero-gastric department (OP)
4 <sup>th</sup> specimen	123456784	Entero-gastric department (OP)
5 <sup>th</sup> specimen	123456785	Entero-gastric department (OP)
Laboratory order	555	Chemistry laboratory (OF)

ID number	Value	Assigned by
1 <sup>st</sup> work order	555_1	Chemistry laboratory (OF)
2 <sup>nd</sup> work order	555_2	Chemistry laboratory (OF)
3 <sup>rd</sup> work order	555_3	Chemistry laboratory (OF)
4 <sup>th</sup> work order	555_4	Chemistry laboratory (OF)

- 2160 **LAB-1 interaction:** The Care Unit collects the first three specimens related to an order for glucose tolerance, with the high priority ‘ASAP’, and sends these specimens to the chemistry laboratory. The Order Placer sends a message “new order” (NW) accompanying the first three specimens, to let the laboratory start the testing. OBR-11 “Specimen action code” is valued to “P” (pending specimen) indicating that some specimens for this order are still pending (i.e., not yet collected). The order placer provides an observation reporting the initial quantity of sugar absorbed by the patient.
- 2165 **LAB-4, LAB-1 and LAB-3 interactions:** The laboratory checks the specimens and schedules the work. The Order Filler sends the first work orders to the Automation Manager. The Order Filler notifies both Order Placer and Order Result Tracker of the scheduled work, notifying that the third specimen being broken, won’t produce any observation. SPM-20 (specimen availability) = ‘N’ and SPM-21 (specimen reject reason) = ‘RB’ (broken container). Since this is a timing series, the Order Placer won’t replace this specimen. There will simply be a missing
- 2170 point in the final observation graph.
- LAB-5, LAB-1 and LAB-3 interactions:** After technical validation, the Automation Manager sends back the first two observations to the Order Filler. Given that the order priority is “ASAP”, the Order Filler notifies these partial results to the Order Result Tracker, and notifies the status change to the Order Placer, without waiting for the clinical validation.
- 2175 **LAB-1 interaction:** Later on, as the two last specimens are sent to the laboratory, the Order Placer sends an additional message for that order, with the order control “change order request” (XO). This message contains the complete list of specimens. OBR-11 “Specimen action code” is valued to “S”, indicating that the specimen collection is complete, and that the laboratory can achieve its work.
- 2180 **LAB-4, LAB-1 and LAB-3 interactions:** The laboratory checks the last specimens. The Order Filler sends the last work orders to the Automation Manager. The Order Filler notifies both Order Placer and Order Result Tracker with the progress of the order.
- LAB-5 interaction:** After technical validation, the Automation Manager sends the last results to the Order Filler.
- 2185 **LAB-1 and LAB-3 interactions:** After clinical validation, the Order Filler notifies the final results to the Order Result Tracker, and notifies the status change to the Order Placer.



*The related acknowledgement message isn't shown.*

2210

**4.3.3.2 LAB-4 (OF → AM): Message “New order” with the first 2 Specimens**

Two new work orders sent to the Automation Manager: Priority ASAP. One observation provided.

2215 MSH|^~\&|OF|Chemistry|AM|Automation|200309060825||OML^O21^OML\_O21|msgOF101|T|2.5|123||  
 ||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 ORC|NW||666^gastric|||||200309060824|222221^NURSE^NANCY|||||||  
 Entero-gastric^^^^^FI^^EG02  
 2220 TQ1|||||||A  
 OBR||555\_1^chemistry||GLUC^GLUCOSE^L|||||1234^BLEEDER|S|||||22222^PHYSICIAN^^^DR|82  
 1  
 SPM|1|123456781^gastric||SER|||||P|||||200309060735|200309060821|||||||1  
 2225 ORC|NW||666^gastric|||||200309060710|222221^NURSE^NANCY|||||||  
 Entero-gastric^^^^^FI^^EG02  
 TQ1|||||||A  
 OBR||555\_2^chemistry||GLUC^GLUCOSE^L|||||1234^BLEEDER|S|||||  
 22222^PHYSICIAN^^^DR|821  
 SPM|1|123456782^gastric||SER|||||P|||||200309060755|200309060821|||||||1  
 2230

*The related acknowledgement message isn't shown.*

**4.3.3.3 LAB-1 (OF → OP): Message “Status changed” with the first 3 Specimens**

The placer order has been assigned a filler order number. One specimen is rejected:

2235 MSH|^~\&|OF|Chemistry|OP|Entero-gastric|200309060825||OML^O21^OML\_O21|msgOF102|  
 T|2.5|123|||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 2240 ORC|SC|12345678^gastric||666^gastric|IP|||||200309060824|222221^NURSE^NANCY|||||||  
 Entero-gastric^^^^^FI^^EG02  
 TQ1|||||||A  
 OBR||12345678^gastric||555^chemistry||82951^Glucose Tolerance Test^C4|||||  
 1234^BLEEDER|P|||||22222^PHYSICIAN^^^DR|821|||||||I  
 SPM|1|123456781^gastric||SER|||||P|||||200309060735|200309060821|Y|||||1  
 2245 SPM|2|123456782^gastric||SER|||||P|||||200309060755|200309060821|Y|||||1  
 SPM|3|123456783^gastric||SER|||||P|||||200309060815|200309060821|N|RB|||||1

*The related acknowledgement message isn't shown.*

**2250 4.3.3.4 LAB-3 (OF → ORT): Message “New order” with the first 3 Specimens**

The Order Result Tracker is notified with the creation of the filler order: The observation related to the 3<sup>rd</sup> specimen (unavailable) is canceled.

2255 MSH|^~\&|OF|Chemistry|ORT||200309060825||ORU^R01^ORU\_R01|msgOF103|T|2.5|123|||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345

```

ORC|SC|12345678^gastric||666^gastric|IP|||200309060824|222221^NURSE^NANCY
|||Enterogastric^^^^^FI^^EG02
OBR|12345678^gastric|555^chemistry|82951^Glucose Tolerance Test^C4|||1234^BLEEDER|P|||222222^PHYSICIAN^^^DR|821|||I
2260 TQ1|||A
OBX|1|NM|GLUCOSE|75|g|||F||200309060735
OBX|2|NM|30264-6^GLUCOSE 40M POST DOSE GLUCOSE^LN|||X
SPM|1|123456781^gastric||SER|||P|||200309060735|200309060821|Y|||1
2265 SPM|2|123456782^gastric||SER|||P|||200309060755|200309060821|Y|||1
SPM|3|123456783^gastric||SER|||P|||200309060815|200309060821|N|RB|||1
    
```

*The related acknowledgement message isn't shown.*

### 4.3.3.5 LAB-5 (AM → OF): Message “New results” for the first 2 Work Orders

2270 **The Automation Manager sends the two final results for the 2 work orders, technically validated by Suzy TECHNICIAN at 8h33:**

```

MSH|^~\&|AM|Automation|OF|Chemistry|200309060833||OUL^R22^OUL_R22|msgAM1|T|2.5|123|||
USA||EN
PID|1||12345^5^M10^Memphis_Hosp^PI||EVERYMAN^ADAM^^JR^^L|19800101|M
2275 SPM|1|123456781^gastric||SER|||P|||200309060735|200309060821|||1
OBR||555_1^chemistry||GLUC^GLUCOSE^L|||1234^BLEEDER
|S|||222222^PHYSICIAN^^^DR|821|||200309060832||F|||
333333&TECHNICIAN&Suzy&&&&MEMPHIS HOSPITAL^200309060833
OBX|1|NM|14749-6^GLUCOSE^LN||4200|umol/l||N||F||200309060830
2280 SPM|2|123456782^gastric||SER|||P|||200309060755|200309060821|||1
OBR||555_2^chemistry||GLUC^GLUCOSE^L|||1234^BLEEDER
|S|||222222^PHYSICIAN^^^DR|821|||200309060832||F|||
333333&TECHNICIAN&Suzy&&&&MEMPHIS HOSPITAL^200309060833
OBX|1|NM|14749-6^GLUCOSE^LN||6000|umol/l||N||F||200309060832
2285
    
```

*The related acknowledgement message isn't shown.*

### 4.3.3.6 LAB-1 (OF → OP): Message “Status Changed”

**Some results are available, not clinically validated (i.e., not verified)**

```

2290 MSH|^~\&|OF|Chemistry|OP|Enterogastric|200309060834||OML^O21^OML_O21|msgOF104|
T|2.5|123|||USA||EN
PID|1||12345^5^M10^Memphis_Hosp^PI||EVERYMAN^ADAM^^JR^^L|19800101|M
PV1|1|O|Ward|||12345
2295 ORC|SC|12345678^gastric||666^gastric|A|||200309060834|222221^NURSE^NANCY|
|||Enterogastric^^^^^FI^^EG02
TQ1|||A
OBR||12345678^gastric|555^chemistry|82951^Glucose Tolerance
Test^C4|||1234^BLEEDER|P|||222222^PHYSICIAN^^^DR|821|||R
SPM|1|123456781^gastric||SER|||P|||200309060735|200309060821|Y|||1
2300 SPM|2|123456782^gastric||SER|||P|||200309060755|200309060821|Y|||1
SPM|3|123456783^gastric||SER|||P|||200309060815|200309060821|N|RB|||1
    
```

*The related acknowledgement message isn't shown.*

**2305 4.3.3.7 LAB-3 (OF → ORT): Message “Status Changed”****The two first results are sent, not clinically validated (i.e., not verified):**

MSH|^~\&|OF|Chemistry|ORT||200309060825||ORU^R01^ORU\_R01|msgOF105|T|2.5|123|||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 2310 ORC|SC|12345678^gastric||666^gastric|A|||200309060834|22221^NURSE^NANCY|  
 |||Enterogastric^^^^^FI^^EG02  
 OBR||12345678^gastric|^chemistry|82951^Glucose Tolerance  
 Test^C4|||||1234^BLEEDER|P|||||22222^PHYSICIAN^^^DR|821|||||R  
 TQ1|||||A  
 2315 OBX|1|NM|GLUCOSE||75|g|||||F|||200309060735  
 OBX|2|NM|14996-3^GLUCOSE PRE 75 G GLUCOSE PO^LN||4200|umol/l|4000-6100|N||  
 R||200309060755  
 OBX|3|NM|30263-8^GLUCOSE 20M POST DOSE GLUCOSE^LN||6000|umol/l|<7800|N||  
 R||200309060755  
 2320 OBX|4|NM|30264-6^GLUCOSE 40M POST DOSE GLUCOSE^LN|||X  
 SPM|1|123456781^gastric||SER|||||P|||||200309060735|200309060821||Y|||||1  
 SPM|2|123456782^gastric||SER|||||P|||||200309060755|200309060821||Y|||||1  
 SPM|3|123456783^gastric||SER|||||P|||||200309060815|200309060821||N|RB^Broken  
 container|||||1  
 2325 *The related acknowledgement message isn't shown.*

**4.3.3.8 LAB-1(OP → OF): Message “Change Order/Service Request”****The last 2 specimens have been collected and are sent to the laboratory:**

MSH|^~\&|OP|Enterogastric|OF|Chemistry|200309060900||OML^O21^OML\_O21|msgOP124|  
 T|2.5|123|||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 2330 ORC|XO|12345678^gastric||666^gastric|||200309060855|22221^NURSE^NANCY|  
 |||Enterogastric^^^^^FI^^EG02  
 TQ1|||||A  
 2335 OBR||12345678^gastric||82951^Glucose Tolerance Test^C4|||||1234^BLEEDER|S|||||  
 22222^PHYSICIAN^^^DR|821  
 OBX|1|NM|GLUCOSE||75|g|||||F|||200309060735  
 2340 SPM|1|123456781^gastric||SER|||||P|||||200309060735|1  
 SPM|2|123456782^gastric||SER|||||P|||||200309060755|1  
 SPM|3|123456783^gastric||SER|||||P|||||200309060815|1  
 SPM|4|123456784^gastric||SER|||||P|||||200309060835|1  
 SPM|5|123456785^gastric||SER|||||P|||||200309060855|1  
 2345 *The related acknowledgement message isn't shown.*

**4.3.3.9 LAB-4 (OF → AM): Message “New order” with the last 2 Specimens****Two new work orders sent to the Automation Manager:**

MSH|^~\&|OF|Chemistry|AM|Automation|200309060905||OML^O21^OML\_O21|msgOF106|T|2.5|123|  
 |||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI||EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 2350 ORC|NW||666^gastric|||200309060904|22221^NURSE^NANCY|  
 Enterogastric^^^^^FI^^EG02  
 TQ1|||||A  
 2355

2360 OBR || 555\_4^chemistry || GLUC^GLUCOSE^L || || || 1234^BLEEDER |  
 S || || 222222^PHYSICIAN^^^DR | 821  
 SPM | 1 | 123456784^gastric || SER || || || P || || || 200309060835 | 200309060902 | || || || 1  
 ORC | NW || 666^gastric || || 200309060904 | 222221^NURSE^NANCY || || || || ||  
 Entero-gastric^^^^^FI^^EG02  
 TQ1 || || || || A  
 OBR || 555\_5^chemistry || GLUC^GLUCOSE^L || || || 1234^BLEEDER | S || || ||  
 222222^PHYSICIAN^^^DR | 821  
 SPM | 1 | 123456785^gastric || SER || || || P || || || 200309060855 | 200309060902 | || || || 1

2365 The related acknowledgement message isn't shown.

### 4.3.3.10 LAB-1 (OF → OP): Message “Status changed” with all Specimens

All the specimens have been checked by the laboratory staff.

2370 MSH | ^~\& | OF | Chemistry | OP | Entero-gastric | 200309060905 | OML^O21^OML\_O21 | msgOF107 |  
 T | 2.5 | 123 | || USA | EN  
 PID | 1 | 12345^5^M10^Memphis\_Hosp^PI | EVERYMAN^ADAM^^JR^^L | 19800101 | M  
 PV1 | 1 | O | Ward | || || || || || 12345  
 ORC | SC | 12345678^gastric || 666^gastric | A || || 200309060904 | 222221^NURSE^NANCY |  
 || || || || Entero-gastric^^^^^FI^^EG02  
 2375 TQ1 || || || || A  
 OBR || 12345678^gastric | 555^chemistry | 82951^Glucose Tolerance test^C4 || || ||  
 1234^BLEEDER | P || || 222222^PHYSICIAN^^^DR | 821 || || || R  
 SPM | 1 | 123456781^gastric || SER || || || P || || || 200309060735 | 200309060821 | Y || || 1  
 SPM | 2 | 123456782^gastric || SER || || || P || || || 200309060755 | 200309060821 | Y || || 1  
 2380 SPM | 3 | 123456783^gastric || SER || || || P || || || 200309060815 | 200309060821 | N | RB || 1  
 SPM | 4 | 123456784^gastric || SER || || || P || || || 200309060835 | 200309060902 | Y || || 1  
 SPM | 5 | 123456785^gastric || SER || || || P || || || 200309060855 | 200309060902 | Y || || 1

The related acknowledgement message isn't shown.

### 4.3.3.11 LAB-3 (OF → ORT): Message “Status Changed”

The last two specimens have been received. All the work is scheduled:

2390 MSH | ^~\& | OF | Chemistry | ORT | 200309060905 | ORU^R01^ORU\_R01 | msgOF108 | T | 2.5 | 123 | || USA | EN  
 PID | 1 | 12345^5^M10^Memphis\_Hosp^PI | EVERYMAN^ADAM^^JR^^L | 19800101 | M  
 PV1 | 1 | O | Ward | || || || || || 12345  
 ORC | SC | 12345678^gastric || 666^gastric | A || || 200309060904 | 222221^NURSE^NANCY || || || || En  
 tero-gastric^^^^^FI^^EG02  
 OBR || 12345678^gastric | 555^chemistry | 82951^Glucose Tolerance Test^C4 || || ||  
 1234^BLEEDER | S || || 222222^PHYSICIAN^^^DR | 821 || || || R  
 TQ1 || || || || A  
 2395 OBX | 1 | NM | GLUCOSE | 75 | g | || F || 200309060735  
 OBX | 2 | NM | 14996-3^GLUCOSE PRE 75 G GLUCOSE PO^LN | 4200 | umol/l | 4000-6100 | N ||  
 R || 200309060735  
 OBX | 3 | NM | 30263-8^GLUCOSE 20M POST DOSE GLUCOSE^LN | 6000 | umol/l | <7800 | N ||  
 R || 200309060755  
 2400 OBX | 4 | NM | 30264-6^GLUCOSE 40M POST DOSE GLUCOSE^LN || || || X  
 SPM | 1 | 123456781^gastric || SER || || || P || || || 200309060735 | 200309060821 | Y || || 1  
 SPM | 2 | 123456782^gastric || SER || || || P || || || 200309060755 | 200309060821 | Y || || 1  
 SPM | 3 | 123456783^gastric || SER || || || P || || || 200309060815 | 200309060821 | N | RB^Broken  
 container || || || 1  
 2405 SPM | 4 | 123456784^gastric || SER || || || P || || || 200309060835 | 200309060902 | Y || || 1  
 SPM | 5 | 123456785^gastric || SER || || || P || || || 200309060855 | 200309060902 | Y || || 1

The related acknowledgement message isn't shown.

**4.3.3.12 LAB-5 (AM → OF): Message “New results” for the last 2 Work Orders**

2410 **The Automation Manager sends the two final results for the 2 work orders, technically validated by Suzy TECHNICIAN at 9h12.**

```
MSH|^~\&|AM|Automation|OF|Chemistry|200309060912||OUL^R22^OUL_R22|msgAM2|
T|2.5|123|||USA|EN
PID|1||12345^5^M10^Memphis_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M
2415 SPM|1|123456784^gastric||SER||||P|||||200309060835|200309060902|||||1
OBR||555_4^chemistry||30266-1^GLUCOSE 1.6H POST DOSE GLUCOSE^LN|||||1234^BLEEDER|S||||
S||||22222^PHYSICIAN^^^DR|821|||||200309060911||F|||||
33333&TECHNICIAN&Suzy&&&&MEMPHIS_HOSPITAL^200309060912
OBX|1|NM|14749-6^GLUCOSE^LN|7200|umol/l|N||F|||200309060910
2420 SPM|2|123456785^gastric||SER||||P|||||200309060855|200309060902|||||1
OBR||555_5^chemistry||GLUC^GLUCOSE^L|||||1234^BLEEDER|S||||
S||||22222^PHYSICIAN^^^DR|821|||||200309060911||F|||||
33333&TECHNICIAN&Suzy&&&&MEMPHIS_HOSPITAL^200309060912
OBX|1|NM|14749-6^GLUCOSE^LN|7100|umol/l|N||F|||200309060911
```

2425 *The related acknowledgement message isn't shown.*

**4.3.3.13 LAB-1 (OF → OP): Message “Status Changed”**

2430 **Jane CHEMISTRY-EXPERT has performed the clinical validation at 9h29. The order is completed.**

```
MSH|^~\&|OF|Chemistry|OP|Entero-gastric|200309060930||OML^O21^OML_O21|msgOF109|
T|2.5|123|||USA|EN
PID|1||12345^5^M10^Memphis_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M
PV1|1|O|Ward|||||||12345
2435 ORC|SC|12345678^gastric||666^gastric|CM|||200309060929|22222^NURSE^NANCY|||||||E
ntero-gastric^^^^^FI^^EG02
TQ1|||||A
OBR||12345678^gastric||555^chemistry||82951^Glucose Tolerance Test^C4|||||
1234^BLEEDER|S|||||22222^PHYSICIAN^^^DR|821|||||200309060929||F|||||
2440 44444&CHEMISTRY-EXPERT&Jane&&&&MEMPHIS_HOSPITAL^200309060929
SPM|1|123456781^gastric||SER||||P|||||200309060735|200309060821|Y|||||1
SPM|2|123456782^gastric||SER||||P|||||200309060755|200309060821|Y|||||1
SPM|3|123456783^gastric||SER||||P|||||200309060815|200309060821|N|RB|||||1
2445 SPM|4|123456784^gastric||SER||||P|||||200309060835|200309060902|Y|||||1
SPM|5|123456785^gastric||SER||||P|||||200309060855|200309060902|Y|||||1
```

The related acknowledgement message isn't shown.

**4.3.3.14 LAB-3 (OF → ORT): Message “Status Changed”**

2450 **Jane CHEMISTRY-EXPERT has performed the clinical validation at 9h29. The order is completed. The results are final.**

```
MSH|^~\&|OF|Chemistry|ORT||200309060930||ORU^R01^ORU_R01|msgOF110|T|2.5|123|||USA|EN
PID|1||12345^5^M10^Memphis_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M
PV1|1|O|Ward|||||||12345
```



2455 ORC | SC | 12345678^gastric | 666^gastric | CM | || | 200309060929 | 222221^NURSE^NANCY | || || || || || || || E  
ntero-gastric^^^^^^FI^^EG02  
OBR | 12345678^gastric | 555^chemistry | 82951^Glucose Tolerance Test^C4 | || || ||  
1234^BLEEDER | S | || || | 222222^PHYSICIAN^ ^^DR | 821 | || || | 200309060929 | || F | || || || ||  
444444&CHEMISTRY-EXPERT&Jane&&&&&MEMPHIS HOSPITAL^200309060929

2460 TQ1 | || || || || || A  
OBX | 1 | NM | GLUCOSE | 75 | g | || || | F | || | 200309060735  
OBX | 2 | NM | 14996-3^GLUCOSE PRE 75 G GLUCOSE PO^LN | 4200 | umol/l | 4000-6100 | N | ||  
F | || | 200309060735  
OBX | 3 | NM | 30263-8^GLUCOSE 20M POST DOSE GLUCOSE^LN | 6000 | umol/l | <7800 | N | ||  
F | || | 200309060755

2465 OBX | 4 | NM | 30264-6^GLUCOSE 40M POST DOSE GLUCOSE^LN | || || || || X  
OBX | 5 | NM | 14756-1^GLUCOSE 1H POST DOSE GLUCOSE^LN | 7200 | umol/l | <7800 | N | ||  
F | || | 200309060835

2470 OBX | 6 | NM | 30265-3^GLUCOSE 1.3H POST DOSE GLUCOSE^LN | 7100 | umol/l | <7800 | N | ||  
F | || | 200309060855  
SPM | 1 | 123456781^gastric | | SER | || || || | P | || || | 200309060735 | 200309060821 | | Y | || || | 1  
SPM | 2 | 123456782^gastric | | SER | || || || | P | || || | 200309060755 | 200309060821 | | Y | || || | 1  
SPM | 3 | 123456783^gastric | | SER | || || || | P | || || | 200309060815 | 200309060821 | | N | RB^Broken  
container | || || | 1

2475 SPM | 4 | 123456784^gastric | | SER | || || || | P | || || | 200309060835 | 200309060902 | | Y | || || | 1  
SPM | 5 | 123456785^gastric | | SER | || || || | P | || || | 200309060855 | 200309060902 | | Y | || || | 1

*The related acknowledgement message isn't shown.*

2480

## 4.4 Battery with 2 Specimens: Creatinine clearance

### 4.4.1 Storyboard

2485 This example corresponds to the use case described in Volume 1 as “Externally placed order with specimens unidentified or to be collected by the laboratory”. The specimens are not identified by the ordering care unit.

Dr. Nephro orders one battery of one test: a creatinine clearance.

2490 The battery consists of a procedure applied on two specimen type, serum and 24 hour urine. At the end of the 24 hour urine collection process, the specimen collector measures the collected urine volume, records the duration of collection, takes a urine sample from the 24 hours collection and draws a serum sample from the patient.

The order is assumed to be part of a group of placer orders identified by the placer group number ‘777’.

#### Human actors and organizations participating to the process:

2495 Assigning authority: Abbeville Hospital  
 Placer: Nephrology department  
 Filler: Chemistry laboratory  
 Ordering facility: Nephrology  
 2500 Patient: John Ill, Patient hospital identifier: 6543210, Patient visit number: 9998888,  
 class = inpatient  
 Orderer: Dr. Nephro  
 Placer order enterer: Janet Nurse  
 Specimen collector: John Collect  
 Technician: Marc Techos  
 2505 Clinical expert: Jane Chemistry

#### ID numbers used by the workflow:

ID number	Value	Assigned by
Patient hospital ID	6543210	Admission office (ADT)
Patient visit number	9998888	Admission office (ADT)
Care unit order group	777	Nephrology department (OP)
Care unit order	9876543	Nephrology department (OP)
Laboratory order (1 <sup>st</sup> battery) idem for work order	654	Chemistry laboratory (OF)
Specimen Serum	654_1	Chemistry laboratory (OF)
Specimen Urine	654_2	Chemistry laboratory (OF)

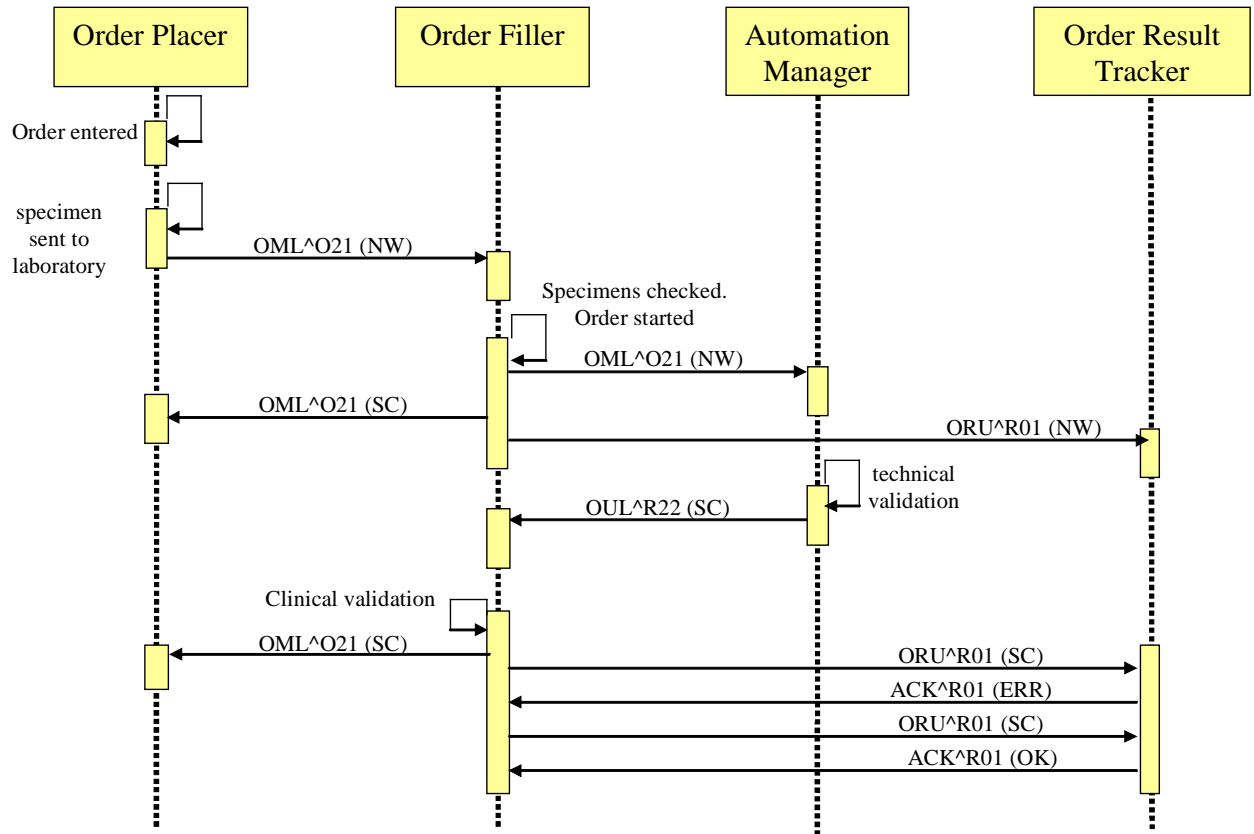
2510 **LAB-1 interaction:** The Care Unit processes the specimen collection related to an order for a creatinine clearance, and sends the notified or measured values and the specimens to the chemistry laboratory. The Order Placer sends a message “new order” (NW) accompanying the specimen, to let the laboratory start the testing.

2515 **LAB-4, LAB-1 and LAB-3 interactions:** The laboratory checks the specimens and schedules the work. An identifier is assigned to the specimens by the Order Filler and the corresponding identification labels are printed out. The Order Filler sends a unique work order to the Automation Manager. The Order Filler notifies both Order Placer and Order Result Tracker of the scheduled work.

**LAB-5, LAB-1 and LAB-3 interactions:** After technical validation by a laboratory technician (Marc Techos), the Automation Manager sends back all the observations to the Order Filler.

2520 **LAB-1 and LAB-3 interactions:** After clinical validation, the Order Filler notifies the results to the Order Result Tracker, and notifies the status change to the Order Placer. The last interaction in transaction LAB-3 shows a negative acknowledgement and a repetition of the message followed by the final positive acknowledgement.

4.4.2 Interaction Diagram



2525

### 4.4.3 Messages

#### 4.4.3.1 LAB-1 (OP → OF): Message “New order” with one Specimen

**A new placer order sent to the Order Filler:**

```

2530 MSH|^~\&|OP|Nephrology|OF|Chemistry|200310060820||OML^O21^OML_O21|001|T|2.5|||USA||E
N
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^^L||19810101|M
PV1|1|I|||||||9998888
ORC|NW|9876543^Nephro|777^Nephro|||200310060710|^NURSE^JANET|||
2535 Nephrology^^^^^FI^^NE03
TQ1|1|||||R
OBR|1|9876543^Nephro||82575^Creatinine clearance^C4|||^COLLECT^JOHN|S|||
^NEPHRO^^^^DR
OBX|1|NM|13362-9^URINE COLLECTION DURATION^LN||24|hr|||F||200309060735
2540 OBX|2|NM|19153-6^URINE SPECIMEN VOLUME^LN||2500|ml|||F||200309060735
SPM|1||SER|||||P|||||200310060735|||1
SPM|2||UR|||||P|||||200310060735|||1
ORC|NW||777^Nephro|||200310060710|^NURSE^JANET|||Nephrology^^^^^FI^^NE03
OBR|2|98765432^Nephro||11502-2^LABORATORY REPORT.TOTAL^LN|
2545

```

The related acknowledgement message isn't shown.

#### 4.4.3.2 LAB-4 (OF → AM): Message “New order”

**A new work order is sent to the Automation Manager:**

```

2550 MSH|^~\&|OF|Chemistry|AM|Automation|200310060825||OML^O21^OML_O21|011|T|2.5|||USA||E
N
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^^L||19810101|M
PV1|1|I||||||9998888
ORC|NW||777^Nephro|||200310060710|^NURSE^JANET|||
2555 Nephrology^^^^^FI^^NE03
TQ1|1|||||R
OBR|1|654^chemistry||82575^Creatinine clearance^C4|||^COLLECT^JOHN|S|||
^NEPHRO^^^^DR
OBX|1|NM|13362-9^URINE COLLECTION DURATION^LN||24|hr|||F||200309060735
2560 OBX|2|NM|19153-6^URINE SPECIMEN VOLUME^LN||2500|ml|||F||200309060735
SPM|1|654_1^chemistry|SER|||||P|||||200310060735|200310060821|||1
SPM|2|654_2^chemistry|UR|||||P|||||200310060735|200310060821|||1

```

The related acknowledgement message isn't shown.

2565

#### 4.4.3.3 LAB-1 (OF → OP): Message “Status Changed”

**The placer order has been assigned a filler order number, the specimen is available and identified by the laboratory:**

```

2570 MSH|^~\&|OF|Chemistry|OP|Nephrology|200310060825||OML^O21^OML_O21|012|T|2.5|||USA||E
N
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^^L||19810101|M
PV1|1|I||||||9998888
ORC|SC|9876543^Nephro|777^Nephro|IP|||200310060710|^NURSE^JANET|||
Nephrology^^^^^FI^^NE03

```

2575 TQ1|1||| |R  
OBR|1|9876543^Nephro|654^chemistry|82575^Creatinine clearance^C4|  
|||^COLLECT^JOHN|P|||^NEPHRO^^^DR|||I  
SPM|1|654\_1^chemistry|SER|||P|||200310060735|200310060821|Y|||1  
SPM|2|654\_2^chemistry|UR|||P|||200310060735|200310060821|Y|||1

2580

The related acknowledgement message isn't shown.

#### 4.4.3.4 LAB-3 (OF->ORT): Message “New Order”

The Order Result Tracker is notified with the creation of the filler order:

```

2585 MSH|^~\&|OF|Chemistry|ORT||200310060825||ORU^R01^ORU_R01|013|T|2.5|||USA|EN
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M
PV1|1|I|||||||9998888
ORC|SC|9876543^Nephro|777^Nephro|IP|||200310060710|^NURSE^JANET|||Nephrology^^^^^FI^^NE03
2590 OBR|1|9876543^Nephro|654^chemistry|82575^Creatinine clearance^C4|
|||^COLLECT^JOHN|P|||^NEPHRO^^^DR|||I
TQ1|1|I|||||R
SPM|1|654_1^chemistry|SER|||||P|||||200310060735|200310060821|Y|||1
SPM|2|654_2^chemistry|UR|||||P|||||200310060735|200310060821|Y|||1
2595 OBX|1|NM|13362^9^URINE COLLECTION DURATION^LN||24|hr|||F||200309060735
OBX|2|NM|19153-6^URINE SPECIMEN VOLUME^LN||2500|ml|||F||200309060735
    
```

The related acknowledgement message isn't shown.

#### 4.4.3.5 LAB-5 (AM->OF): Message “New Results”

2600 The Automation Manager sends the final results for the work order:

```

MSH|^~\&|AM|Automation|OF|Nephrology|200310060900||OUL^R22^OUL_R22|3331|T|2.5|||USA|EN
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M
PV1|1|I||||||9998888
2605 SPM|1|654_1^chemistry|SER|||||P|||||200310060735|200310060821|Y|||1
OBR|1|654^chemistry|82575^Creatinine clearance^C4|||^COLLECT^JOHN|
P|||^NEPHRO^^^DR|||200310060832||F|||&TECHOS&MARC^200310060833
OBX|1|NM|15045-8^SERUM CREATININE^LN||93|umol/l|50-100|N||F||200310060830
2610 SPM|2|654_2^chemistry|UR|||||P|||||200310060735|200310060821|Y|||1
OBR|1|654^chemistry|82575^Creatinine clearance^C4|||^COLLECT^JOHN|
P|||^NEPHRO^^^DR|||200310060832||F|||&TECHOS&MARC^200310060833
OBX|1|NM|14684-5^24H URINE CREATININE ^LN||7.06|mmol|8-16 (/24hr)|L||F||200310060830
2615 OBX|2|NM|2164-2^CREATININE CLEARANCE^LN||52.7|ml/min|88-174|L||S|F||200310060830
    
```

The related acknowledgement message isn't shown.

#### 4.4.3.6 LAB-1 (OF->OP): Message “Status Changed”

The clinical expert has performed the clinical validation at 09h29. The order is completed:

```

2620 MSH|^~\&|OF|Nephrology|OP|Nephrology|200310060930||OML^O21^OML_O21|014|T|2.5|||USA|EN
PID|1||6543210^^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M
PV1|1|I||||||9998888
2625 ORC|SC|9876543^Nephro|777^Nephro|CM|||200310060710|^NURSE^JANET|||Nephrology^^^^^FI^^NE03
TQ1|1|I|||||R
OBR|1|9876543^Nephro|654^chemistry|82575^Creatinine clearance^C4|
|||^COLLECT^JOHN|P|||^NEPHRO^^^DR|||F|||&CYTO&JANE^200310060929
2630 SPM|1|654_1^chemistry|SER|||||P|||||200310060735|200310060821|Y|||1
SPM|2|654_2^chemistry|UR|||||P|||||200310060735|200310060821|Y|||1
    
```

The related acknowledgement message isn't shown.



## 4.4.3.7 LAB-3 (OF-&gt;ORT): Message “Status Changed”

2635 **The clinical expert has performed the clinical validation at 09h29. The order is completed. The results are final:**

```

MSH|^~\&|OF|Chemistry|ORT||200310060931||ORU^R01^ORU_R01|015|T|2.5|||USA|EN
PID|1||6543210^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M
PV1|1|I|||||||9998888
2640 ORC|SC|9876543^Nephro|777^Nephro|CM|||200310060710|^NURSE^JANET|||
Nephrology^^^^^FI^^NE03
OBR|1|9876543^Nephro|654^chemistry|82575^Creatinine clearance^C4|||^COLLECT^JOHN
|P|||^NEPHRO^^^DR|||200310060929||F|||&CYTO&JANE^200310060929
TQ1|1|||R
2645 OBX|1|NM|2164-2^CREATININE CLEARANCE^LN||52.7|ml/min|88-174|L||S|F||200310060735
OBX|2|NM|15045-8^SERUM CREATININE^LN||93|umol/l|50-100|N||F||200310060735
OBX|3|NM|14684-5^24H URINE CREATININE^LN||7.06|mmol|8-16 (/24hr)|L||F||200310060830
SPM|1|654_1^chemistry|SER||||P||||200310060735|200310060821|Y|||1
SPM|2|654_2^chemistry|UR||||P||||200310060735|200310060821|Y|||1
2650 OBX|1|NM|13362-9^URINE COLLECTION DURATION^LN||24|hr|||F||200309060735
OBX|2|NM|19153-6^URINE SPECIMEN VOLUME^LN||2400|ml|||F||200309060735
ORC|SC||777^Nephro|||200805191100
OBR|2|98765432^Nephro|6542^chemistry|11502-2^LABORATORY
REPORT.TOTAL^LN|||F
2655 OBX|1|RP|11502-2^LABORATORY REPORT.TOTAL^LN||file://hserv/lr/lr12345678.pdf|||F|P

```

**Negative acknowledgement sent by the Order Results Tracker:**

2660 The ERR-4 = ‘E’ indicates that the message could not be integrated. The ERR-3 HL7 error code = 206 informs of the cause: a database locked. The MSA-1 = ‘AR’ says that the incoming message has been application-rejected. In this particular case, the rejection is not related to a value not acceptable in the MSH segment, therefore the sender should repeat its message later.

```

MSH|^~\&|ORT||OF|Cytology|200310060932||ACK^R01^ACK|401|T|2.5|||USA|EN
MSA|AR|015
2665 ERR||206^Application record locked|E

```

**Repetition of the same result message by the Order Filler, one minute later**

```

MSH|^~\&|OF|Chemistry|ORT||200310060931||ORU^R01^ORU_R01|015|T|2.5|||USA|EN
PID|1||6543210^^Abbeville Hospital^PI||ILL^JOHN^^^^L||19810101|M
PV1|1|I|||||||9998888
2670 ORC|SC|9876543^Nephro|777^Nephro|CM|||200310060710|^NURSE^JANET|||
Nephrology^^^^^FI^^NE03
OBR|1|9876543^Nephro|654^chemistry|82575^Creatinine clearance^C4|||^COLLECT^JOHN
|P|||^NEPHRO^^^DR|||200310060929||F|||&CYTO&JANE^200310060929
TQ1|1|||R
2675 OBX|1|NM|2164-2^CREATININE CLEARANCE^LN||52.7|ml/min|88-174|L||S|F||200310060735
SPM|1|654_1^chemistry|SER||||P||||200310060735|200310060821|Y|||1
OBX|1|NM|15045-8^SERUM CREATININE^LN||93|umol/l|50-100|N||F||200310060735
2680 SPM|2|654_2^chemistry|UR||||P||||200310060735|200310060821|Y|||1
OBX|1|NM|13362-9^URINE COLLECTION DURATION^LN||24|hr|||F||200309060735
OBX|2|NM|19153-6^URINE SPECIMEN VOLUME^LN||2400|ml|||F||200309060735
OBX|3|NM|14684-5^24H URINE CREATININE^LN||7.06|mmol|8-16 (/24hr)|L||F||200310060830
ORC|SC||777^Nephro|||200805191100
2685 OBR|2|98765432^Nephro|6542^chemistry|11502-2^LABORATORY
REPORT.TOTAL^LN|||F

```

OBX|1|RP|11502-2^LABORATORY REPORT.TOTAL^LN||file://hserv/lr/lr12345678.pdf|||||F||P

**Positive acknowledgement sent by the Order Results Tracker:**

2690

MSH|^~\&|ORT||OF|Cytology|200310060935||ACK^R01^ACK|401|T|2.5|||||USA|EN  
MSA|AA|015

## 4.5 Microbiology with Two Specimens and Three Germs Identified

### 4.5.1 Storyboard

2695 This storyboard illustrates the use of transaction LAB-2 to notify generated batteries at the Order Filler level (i.e., antibiotic susceptibilities, within the same placer group number).

2700 Dr. Physician orders Microscopy and Culture for two different specimens collected from the same patient. The first specimen is Mid Stream Urine and the second one is Pus taken from a wound on patient's left toe. Since several batteries could be performed on each specimen (e.g., Microscopy and Culture, identification of organism, Antibiotic Susceptibility) the Order Placer transmits an OML^O33 message. Since both specimens are part of the same prescription, they are grouped via the Placer Group Number '777'.

The patient is an Outpatient in Emergency ward.

2705 We presume that all tests are performed manually and that results are directly entered by the laboratory technician in the Order Filler system, there is then neither LAB-4, nor LAB-5 transaction in this story board. We also presume that results for observations related to the urine specimen are transferred as soon they are available, whilst the Clinical Expert desires to review results related to other specimen types before they are released.

2710 In this storyboard, a CIS application implements both Actors Order Placer and Order Result Tracker, which suppresses the need for OML messages “Status Change” from OF to OP.

#### Human actors and organizations participating to the process:

Assigning authority: Memphis Hosp 1  
 Placer: Emergency Ward  
 Filler: Microbiology  
 2715 Ordering facility: Emergency Ward  
 Patient: Adam Everyman Jr., account number: 12345 (check-digit 5 modulo 10), class = outpatient  
 Order placed by: Dr. PHYSICIAN, phone number 821, ID number in the hospital 222222.  
 Placer order enterer: Nancy NURSE, ID number 222221  
 2720 Specimen collector: Nancy NURSE, ID number 222221  
 Technician: Terry BACK, ID number 333231  
 Clinical expert: Mike ROSCOP, ID number 444642

#### ID numbers used by the workflow:

ID number	Value	Assigned by
Patient ID	12345	Admission office (ADT)
Care unit order for Urine Spec.	12345679	Emergency Ward (OP)
Care unit order for Pus Spec.	12345670	Emergency Ward (OP)

ID number	Value	Assigned by
Care unit order group	777	Emergency Ward (OP)
1 <sup>st</sup> specimen	123456791	Emergency Ward (OP)
2 <sup>nd</sup> specimen	123456701	Emergency Ward (OP)
Laboratory order for the Urine	MSU0309922	Microbiology laboratory (OF)
Laboratory order for the PUS	PUS0300666	Microbiology laboratory (OF)

2725

**Day 1 at 8:10 LAB-1 interaction:** The two specimens are collected and transmitted to the Microbiology laboratory in Routine. The Order Placer sends a message “new order” (NW) to the order placer.

2730

**Day 1 at 8:20 LAB-3 interaction:** The laboratory checks the specimens and schedules the work. The Order Filler notifies Order Result Tracker of the scheduled work.

**Day 1 at 14:46 LAB-3 interaction:** After Microscopy for the Urine Specimen is achieved, the Order Filler notifies these partial results to the Order Result Tracker without waiting for the clinical validation.

2735

**Day 2 at 09:40 LAB-2 and LAB-3 interactions:** The following day, the Urine culture is positive, the laboratory adds Organism identification and Antibiotic Susceptibility test for this specimen. The Order Filler requires a Placer Order Number to the Order Placer for the added tests (Transaction LAB-2) and notifies this action to the Order Result Tracker via transaction LAB-3.

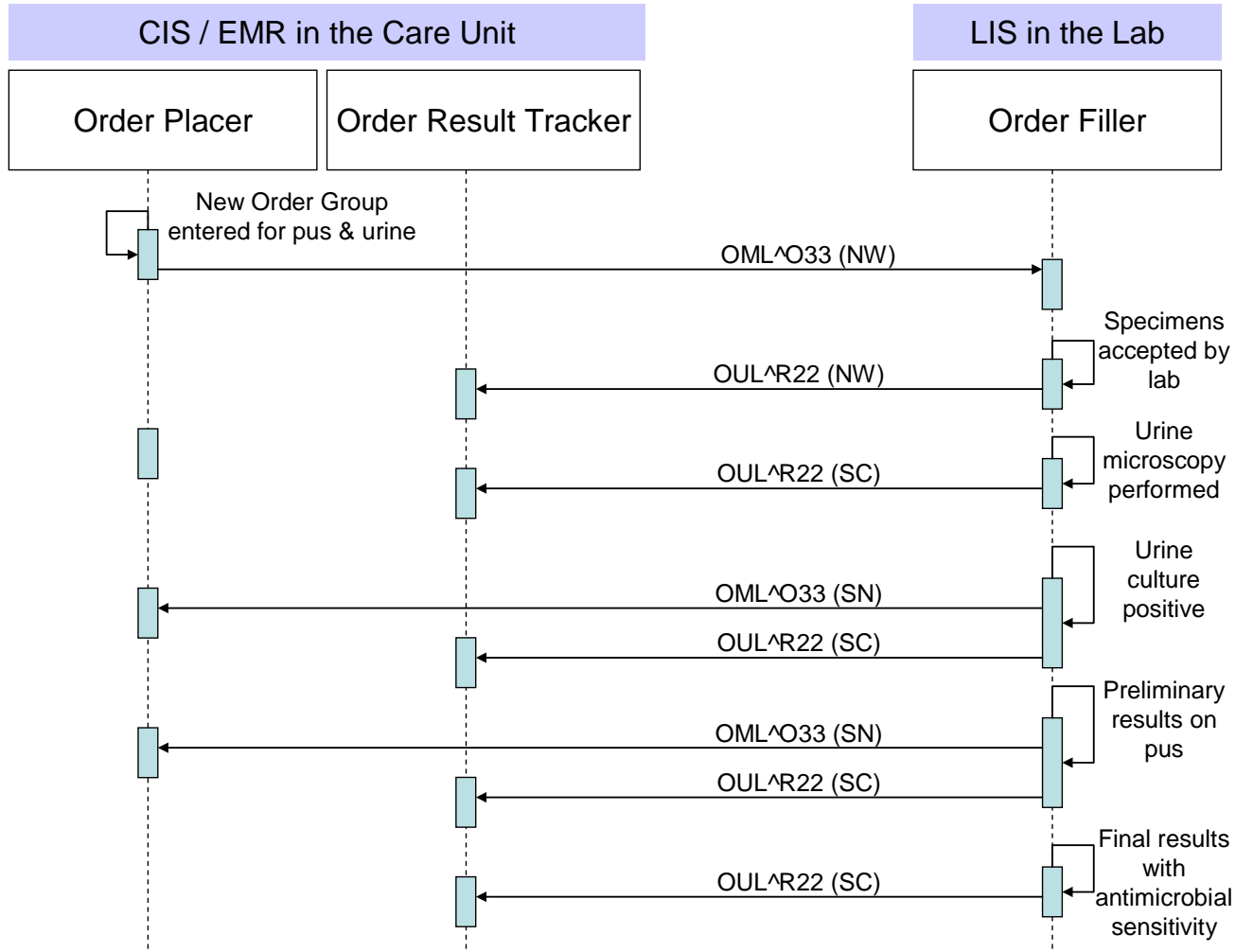
2740

**Day 2 at 09:45 LAB-2 and LAB-3 interactions:** The result of Microscopy and Culture is positive for the Pus specimen, the clinical expert has validated these preliminary results and the laboratory adds Organism identification and Antibiotic Susceptibility test for this specimen. The Order Filler requires a Placer Order Number to the Order Placer for the added tests (Transaction LAB-2) and it notifies this action to the Order Result Tracker via transaction LAB-3.

2745

**Day 3 at 11:32 LAB-3 interaction:** The next day, organism identification and Antibiotic Susceptibility tests are achieved; final results are transmitted to the Order Result Tracker after the clinical validation has been performed.

4.5.2 Interaction Diagram



2750

### 4.5.3 Messages

#### 4.5.3.1 LAB-1 (OP → OF): Message “New order” with Two Specimens

2755 **Day 1 at 8:10 A new placer order sent to the Order Filler.**

```
MSH|^~\&|OP|Emergency Ward|OF|Microbiology|200309060810||OML^O33^OML_O33|msgOP123|
T|2.5|123|||USA||EN
PID|1||12345^5^M10^Memphis_Hosp^PI||EVERYMAN^ADAM^^JR^^L|19800101|M
PV1|1|O|Ward|||||||||12345
2760 SPM|1|123456791^Emergency||MSU^Mid Stream Urine^L|||||P|||||200309060800|||||1
ORC|NW|12345679^Emergency||777^Emergency|||||200309060800|222221^NURSE^NANCY|||||
|Emergency Ward^^^^^FI^^EW00
TQ1|||||R
2765 OBR|1|12345679^Emergency||87086^Urine Microscopy and Culture^C4|||||S||||
22222^PHYSICIAN^^^DR|
SPM|2|123456701^Emergency||PUS||||TOE|LEFT|P|||||200309060805|||||1
ORC|NW|12345670^Emergency||777^Emergency|||||200309060800|22221^NURSE^NANCY|||||
|Emergency Ward^^^^^FI^^EW00
TQ1|||||R
2770 OBR|1|12345670^Emergency||87040^Microscopy and Culture^C4|||||22221^NURSE^NANCY
|S|||||22222^PHYSICIAN^^^DR|
```

The related acknowledgement message isn't shown.

#### 2775 4.5.3.2 LAB-3 (OF → ORT): Message “New Order”

**Day 1 at 8:20 The Order Result Tracker is notified with the creation of the filler order:**

```
MSH|^~\&|OF|Microbiology|ORT||200309060820||OUL^R22^OUL_R22|msgOF12|T|2.5|123|||
USA||EN
PID|1||12345^5^M10^Memphis_Hosp^PI||EVERYMAN^ADAM^^JR^^L|19800101|M
2780 PV1|1|O|Ward|||||||||12345
SPM|1|123456791^Emergency||MSU^Mid Stream
Urine^L|||||P|||||200309060800|200309060818||Y|...
OBR|1|12345679^Emergency||MSU0309922^Micro|87086^Urine Microscopy and Culture^C4|||||
|||||22222^PHYSICIAN^^^DR|||||I
2785 ORC|SC|12345679^Emergency||777^Emergency|IP|||||200309060818|||||
Emergency Ward^^^^^FI^^EW00
SPM|2|123456701^Emergency||PUS||||TOE|LEFT|P|||||200309060805|200309060818||Y|...
OBR|1|12345670^Emergency||PUS0300666^Micro|87040^Microscopy and
2790 Culture^C4|||||22221^NURSE^NANCY|||||22222^PHYSICIAN^^^DR|||||I
ORC|NW|12345670^Emergency||777^Emergency|IP|||||200309060818|||||
Emergency Ward^^^^^FI^^EW00
```

The related acknowledgement message isn't shown.

#### 2795 4.5.3.3 LAB-3 (OF → ORT): Message “Status Changed”

**Day 1 at 14:46 Urine Microscopy results are sent, not clinically validated (i.e., not verified):**

```
MSH|^~\&|OF|Microbiology|ORT||200309061446||OUL^R22^OUL_R22|msgOF14|T|2.5|123|||USA||
EN
2800 PID|1||12345^5^M10^Memphis_Hosp^PI||EVERYMAN^ADAM^^JR^^L|19800101|M
```

2805 PV1|1|O|Ward|||||||12345  
 SPM|1|123456791^Emergency|MSU^Mid Stream  
 Urine^L|||||P|||||200309060800|200309060818||Y|...  
 OBR|1|12345679^Emergency|MSU0309922^Micro|87086^Urine Microscopy and Culture^C4|||||  
 |||222222^PHYSICIAN^^^DR|||||MB|A  
 ORC|SC|12345679^Emergency||777^Emergency|A|||200309060818|||||||  
 Emergency Ward^^^^^^FI^^EW00  
 TQ1|||||R  
 2810 OBX|1|CE|20453-7^Epithelial Cells^LN|value||N||R||200309061445|333231^BACK^TERRY  
 OBX|2|NM|20455-2^Leukocytes^LN|value|/ml|N||R||200309061445|333231^BACK^TERRY  
 OBX|3|NM|32776-7^Erythrocytes^LN|value|/ml|N||R||200309061445|333231^BACK^TERRY  
 OBX|4|CE|24124-0^Casts^LN|value||N||R||200309061445|333231^BACK^TERRY  
 OBX|5|NM|699-9^Organism Count^LN|value|/ml|N||R||200309061445|333231^BACK^TERRY  
 OBX|6||20430-5^Culture^LN||||N||I||200309070935|333231^BACK^TERRY  
 2815

The related acknowledgement message isn't shown.

#### 4.5.3.4 LAB-2(OF → OP): Message “Send Order Number”

2820 **Day 2 at 9:40 Urine Culture is positive with two microorganisms detected, not identified yet., Reflex tests Organism Identification and two Antimicrobial Susceptibility batteries are added. For each, a placer order number is requested from the Order Placer, within Placer Group Number 777^Emergency.**

2825 MSH|^~\&|OF|Microbiology|OP|Emergency Ward|200309070940||OML^O33^OML\_O33|msgOF15|  
 T|2.5|123|||USA||EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^^JR^^L|19800101|M  
 PV1|1|O|Ward|||||||12345  
 SPM|1|123456791^Emergency|MSU^Mid Stream  
 Urine^L|||||P|||||200309060800|200309060818||Y|...  
 2830 ORC|SN||777^Emergency|||200309070938|333231^BACK^TERRY|||||||  
 Emergency Ward^^^^^^FI^^EW00  
 OBR|1||MSU03099221^Micro|87088^Organism Identification^C4|||||  
 G|||222222^PHYSICIAN^^^DR|||||MB  
 2835 ORC|SN||777^Emergency|||200309070938|333231^BACK^TERRY|||||||Emergency  
 Ward^^^^^^FI^^EW00  
 OBR|2||MSU03099222^Micro|87186^Antibiotic Susceptibility^C4|||||  
 G|||222222^PHYSICIAN^^^DR|||||MB  
 ORC|SN||777^Emergency|||200309070938|333231^BACK^TERRY|||||||Emergency  
 Ward^^^^^^FI^^EW00  
 2840 OBR|3||MSU03099223^Micro|87186^Antibiotic Susceptibility^C4|||||  
 G|||222222^PHYSICIAN^^^DR|||||MB

#### Acknowledgement sent by the Order Placer:

2845 MSH|^~\&|OP|Emergency  
 Ward|OF|Microbiology|200309070940||ORL^O34^ORL\_O34|msgOP123|T|2.5|123|||USA||EN  
 MSA|AA|msgOF15  
 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^^JR^^L|19800101|M  
 2850 SPM|1|123456791^Emergency|MSU^Mid Stream  
 Urine^L|||||P|||||200309060800|200309060818||Y|...  
 ORC|NA|12345681^Emergency||777^Emergency|||200309070938|333231^BACK^TERRY|||||||  
 Emergency Ward^^^^^^FI^^EW00  
 2855 OBR|1|12345681^Emergency|MSU03099221^Micro|87088^Organism Identification^C4|||||  
 G|||222222^PHYSICIAN^^^DR|||||MB

2860 ORC | NA | 12345682^Emergency | 777^Emergency | | | | 200309070938 | 333231^BACK^TERRY | | | | | | | | | |  
 Emergency Ward^^^^^^FI^^EW00  
 OBR | 2 | 12345682^Emergency | MSU03099222^Micro | 87186^Antibiotic Susceptibility^C4 | | | | | | | | | |  
 G | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB  
 ORC | NA | 12345683^Emergency | 777^Emergency | | | | 200309070938 | 333231^BACK^TERRY | | | | | | | | | |  
 Emergency Ward^^^^^^FI^^EW00  
 OBR | 3 | 12345683^Emergency | MSU03099223^Micro | 87186^Antibiotic Susceptibility^C4 | | | | | | | | | |  
 G | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB

2865 **4.5.3.5 LAB-3 (OF → ORT): Message “Status Changed”**

**Day 2 at 09:42 Results for Urine Microscopy and Culture are released. Organism Identification and Antibiotic Susceptibility tests have been added**

Note: The Order Placer has acknowledged transaction LAB-2 and an Order Placer Number has been added to each test added by the laboratory

2870 MSH | ^~\& | OF | Microbiology | ORT | | 200309070942 | | OUL^R22^OUL\_R22 | msgOF16 | T | 2.5 | 123 | | | | USA | |  
 EN  
 PID | 1 | | 12345^5^M10^Memphis\_Hosp^PI | | EVERYMAN^ADAM^^JR^^L | 19800101 | M  
 PV1 | 1 | O | Ward | | | | | | | | | | 12345  
 2875 SPM | 1 | 123456791^Emergency | MSU^Mid Stream Urine^L | | | | | | P | | | | | 200309060800 |  
 200309060818 | | Y | ...  
 OBR | 1 | 12345679^Emergency | MSU0309922^Micro | 87086^Urine Microscopy and Culture^C4 | | | | | | | | | |  
 | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB | R  
 2880 ORC | SC | 12345679^Emergency | 777^Emergency | A | | | | 200309060818 | | | | | | | | | |  
 Emergency Ward^^^^^^FI^^EW00  
 TQ1 | | | | | | | | | | R  
 OBX | 1 | CE | 20453-7^Epithelial Cells^LN | value | | | N | | R | | | 200309061445 | | 333231^BACK^TERRY  
 OBX | 2 | NM | 20455-2^Leukocytes^LN | value /ml | | N | | R | | | 200309061445 | | 333231^BACK^TERRY  
 2885 OBX | 3 | NM | 32776-7^Erythrocytes^LN | value /ml | | N | | R | | | 200309061445 | | 333231^BACK^TERRY  
 OBX | 4 | CE | 24124-0^Casts^LN | value | | | N | | R | | | 200309061445 | | 333231^BACK^TERRY  
 OBX | 5 | NM | 699-9^Organism Count^LN | value /ml | | N | | R | | | 200309061445 | | 333231^BACK^TERRY  
 OBX | 6 | CE | 20430-5^Culture^LN | 2ORG^Two Organisms^L | | N | | R | | | 200309070935 |  
 | 333231^BACK^TERRY  
 OBR | 2 | 12345681^Emergency | MSU03099221^Micro | 87088^Organism Identification^C4 | | | | | | | | | |  
 G | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB | S  
 2890 ORC | SC | 12345681^Emergency | 777^Emergency | IP | | | | 200309070938 | 333231^BACK^TERRY | | | | | | | | | |  
 | | Emergency Ward^^^^^^FI^^EW00  
 OBR | 3 | 12345682^Emergency | MSU03099222^Micro | 87186^Antibiotic Susceptibility^C4 | | | | | | | | | |  
 G | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB | S  
 2895 ORC | SC | 12345682^Emergency | 777^Emergency | IP | | | | 200309070938 | 333231^BACK^TERRY | | | | | | | | | |  
 | | Emergency Ward^^^^^^FI^^EW00  
 OBR | 4 | 12345683^Emergency | MSU03099223^Micro | 87186^Antibiotic Susceptibility^C4 | | | | | | | | | |  
 G | | | | 222222^PHYSICIAN^^^^DR | | | | | | | | | | MB | S  
 2900 ORC | SC | 12345683^Emergency | 777^Emergency | IP | | | | 200309070938 | 333231^BACK^TERRY | | | | | | | | | |  
 | | Emergency Ward^^^^^^FI^^EW00

The related acknowledgement message isn't shown.

**4.5.3.6 LAB-2(OF → OP): Message “Send Order Number”**

2905 **Day 2 at 9:45 Culture for Pus specimen is positive, reflex tests Organism Identification and Antibiotic Susceptibility are added. For each, a placer order number is requested from the Order Placer, within Placer Group Number 777^Emergency.**



2910 MSH|^~\&|OF|Microbiology|OP|Emergency Ward|200309070945||OML^O33|msgOF18|T|2.5|123  
 |||USA|EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||12345  
 SPM|1|123456701^Emergency|PUS|||TOE|LEFT|P|||200309060805|200309060818||Y|...  
 ORC|SN||777^Emergency|||200309070941|333231^BACK^TERRY|||  
 2915 Emergency Ward^^^^^FI^^EW00  
 OBR|1||PUS03006661^Micro|87088^Organism Identification^C4|||  
 G|||22222^PHYSICIAN^^^DR|||MB  
 ORC|SN||777^Emergency|||200309070941|333231^BACK^TERRY|||  
 Emergency Ward^^^^^FI^^EW00  
 2920 OBR|2||PUS03006662^Micro|87186^Antibiotic Susceptibility^C4|||  
 G|||22222^PHYSICIAN^^^DR|||MB

**Acknowledgement sent by the Order Placer:**

2925 MSH|^~\&|OP|Emergency  
 Ward|OF|Microbiology|200309070945||ORL^O34^ORL\_O34|msgOP124|T|2.5|123|||USA|EN  
 MSA|AA|msgOF18  
 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M  
 SPM|1|123456701^Emergency|PUS|||TOE|LEFT|P|||200309060805|200309060818||Y|...  
 2930 ORC|NA|12345685^Emergency|777^Emergency|||200309070941|333231^BACK^TERRY|||  
 Emergency Ward^^^^^FI^^EW00  
 OBR|1||12345685^Emergency|PUS03006661^Micro|87088^Organism Identification^C4|||  
 G|||22222^PHYSICIAN^^^DR|||MB  
 ORC|NA|12345686^Emergency|777^Emergency|||200309070941|333231^BACK^TERRY|||  
 2935 Emergency Ward^^^^^FI^^EW00  
 OBR|2||12345686^Emergency|PUS03006662^Micro|87186^Antibiotic  
 Susceptibility^C4|||G|||22222^PHYSICIAN^^^DR|||MB

**4.5.3.7 LAB-3 (OF → ORT): Message “Status Changed”**

2940 **Day 2 at 09:45 The Clinical Expert has validated the preliminary results of Microscopy and culture for the Pus Specimen.**

Note: Although the Culture is positive, the result status is not "Final" other Organisms may grow during the next 24 hours. Results of culture will be considered as final on Day 3 after 48 hours of incubation.

2945 MSH|^~\&|OF|Microbiology|ORT||200309070945||OUL^R22^OUL\_R22|msgOF19|T|2.5|123|||  
 USA|EN  
 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^JR^^L|19800101|M  
 PV1|1|O|Ward|||12345  
 SPM|1|123456701^Emergency|PUS|||TOE|LEFT|P|||200309060805|200309060818||Y|...  
 2950 OBR|1||12345670^Emergency|PUS03006661^Micro|87040^Microscopy and  
 Culture^C4|||22221^NURSE^NANCY  
 |||22222^PHYSICIAN^^^DR|||MB|P|||444642&ROSCOP&Mike^200309070944  
 ORC|SC|12345670^Emergency|777^Emergency|A|||200309060818|||  
 Emergency Ward^^^^^FI^^EW00  
 2955 OBX|1|NM|32761-9^Leukocytes^LN|value||N||F|||200309061125||333231^BACK^TERRY  
 OBX|2|NM|32762-7^Epithelial Cells^LN|value||N||F|||200309061125||333231^BACK^TERRY  
 OBX|3|CE|20430-5^Culture^LN|POS^Positive^L||N||P|||200309070935||333231^BACK^TERRY  
 OBR|2||12345685^Emergency|PUS03006661^Micro|87088^Organism Identification^C4|||  
 G|||MB|S  
 2960 ORC|SC|12345685^Emergency|777^Emergency|IP|||200309070941|333231^BACK^TERRY|||  
 ||Emergency Ward^^^^^FI^^EW00  
 OBR|3||12345686^Emergency|PUS03006662^Micro|87186^Antibiotic Susceptibility^C4|||  
 G|||MB|S

2965 ORC|SC|12345686^Emergency|777^Emergency|IP|||200309070941|333231^BACK^TERRY|||  
 |Emergency Ward^^^^^FI^^EW00

The related acknowledgement message isn't shown.

#### 4.5.3.8 LAB-3 (OF → ORT): Message “Status Changed”

2970 Day 3 at 11:32 Mike ROSCOP has performed the clinical validation at 11h30. Final results are transmitted.

Note: This message is conforming to the requirements given in section 3.11 “Microbiology Reporting Rules”. In particular: Grouping of the results per microorganism using Observation Sub-ID (OBX-4), and association of antimicrobial sensitivity and microorganism identified, based on the parent/child mechanism: Parent Result (OBR-26) & Parent (OBR-29). Classification of the results (OBX) below an OBR per microorganism.

2975 MSH|^~\&|OF|Microbiology|ORT||200309081132||OUL^R22^OUL\_R22|msgOF21|T|2.5|  
 123|||USA|EN  
 2980 PID|1||12345^5^M10^Memphis\_Hosp^PI|EVERYMAN^ADAM^^JR^^L|19800101|M  
 PV1|1|O|Ward|||12345  
 SPM|1|123456791^Emergency|MSU^Mid Stream  
 Urine^L|||P|||200309060800|200309060818||Y|...  
 OBR|1|12345679^Emergency|MSU0309922^Micro|87086^Urine Microscopy and Culture^C4|||  
 2985 |||22222^PHYSICIAN^^^DR|||MB|F|||444642&ROSCOP&Mike^200309081130  
 ORC|SC|12345679^Emergency|777^Emergency|CM|||200309060818|||Emergency  
 Ward^^^^^FI^^EW00  
 TQ1|||R  
 OBX|1|CE|20453-7^Epithelial Cells^LN||value||N||F||200309061445|333231^BACK^TERRY  
 2990 OBX|2|NM|20455-2^Leukocytes^LN||value/ml|N||F||200309061445|...  
 OBX|3|NM|32776-7^Erythrocytes^LN||value/ml|N||F||200309061445|...  
 OBX|4|CE|24124-0^Casts^LN||value||N||F||200309061445|333231^BACK^TERRY  
 OBX|5|NM|699-9^Organism Count^LN||value/ml|N||F||200309061445|...  
 OBX|6|CE|20430-5^Culture^LN||2ORG^Two Organisms^L||N||F||200309070935|...  
 2995 OBR|2|12345681^Emergency|MSU03099221^Micro|87088^Organism Identification^C4|||  
 |||MB|F|||444642&ROSCOP&Mike^200309081130  
 ORC|SC|12345681^Emergency|777^Emergency|CM|||200309070938|333231^BACK^TERRY|||  
 |Emergency Ward^^^^^FI^^EW00  
 OBX|1|ST|11475-1^Micro organism identified^LN|1|E. Coli||N||F||...  
 3000 OBX|2|ST|11475-1^Micro organism identified^LN|2|Strepto D||N||F||...  
 OBR|3|12345682^Emergency|MSU03099222^Micro|87186^Antibiotic Susceptibility^C4  
 |||MB|F|11475-1&Micro organism identified^LN^1|E. Coli||  
 12345681&Emergency^MSU03099221&Micro||444642&ROSCOP&Mike^200309081130  
 ORC|SC|12345681^Emergency|777^Emergency|CM|||200309070938|333231^BACK^TERRY|||  
 |Emergency Ward^^^^^FI^^EW00  
 3005 OBX|1|SN|18861-5^Amoxicillin^LN|1|>=^0.512|ug/ml|R||F||200309081107|...  
 OBX|2|SN|18864-9^Ampicillin^LN|1|<^0.128|ug/ml|I||F||200309081107|...  
 OBX|3|SN|18952-2^Nalidixate^LN|1|>=^2.0|ug/ml|R||F||200309081107|...  
 OBX|4|SN|18956-3^Norfloxacin^LN|1|value|ug/ml|I||F||200309081107|...  
 3010 OBX|5|SN|18928-2^Gentamicin^LN|1|<^0.032|ug/ml|S||F||200309081107|...  
 OBX|6|SN|25596-8^Fosfomycine^LN|1|<^0.1|ug/ml|S||F||200309081107|...  
 OBX|7|SN|18955-5^Nitrofuranton^LN|1|<^0.25|ug/ml|S||F||200309081107|...  
 OBR|4|12345683^Emergency|MSU03099223^Micro|87186^Antibiotic Susceptibility^C4  
 |||MB|F|11475-1&Micro organism identified^LN^2^Strepto D||  
 12345681&Emergency^MSU03099221&Micro||444642&ROSCOP&Mike^200309081130  
 3015 OBX|8|SN|18965-4^Penicillin G^LN|2|<^0.5|ug/ml|S||F||200309081107|...  
 OBX|9|SN|18861-5^Amoxicillin^LN|2|value|ug/ml|S||F||200309081107|...  
 OBX|10|SN|18864-9^Ampicillin^LN|2|value|ug/ml|S||F||200309081107|...  
 OBX|11|SN|18928-2^Gentamicin^LN|2|value|ug/ml|R||F||200309081107|...  
 OBX|12|SN|18917-5^Doxycycline^LN|2|value|ug/ml|R||F||200309081107|...

3020 OBX|13|SN|18919-1^Erythromycin^LN|2|value|ug/ml||R||F||200309081107|...  
 OBX|14|SN|18974-6^Rifampicin^LN|2|value|ug/ml||S||F||200309081107|...  
 OBX|15|SN|18938-1^Lincomycin^LN|2|value|ug/ml||R||F||200309081107|...  
 SPM|2|123456701^Emergency|PUS||TOE|LEFT|P|||200309060805|200309060818||Y|...  
 3025 OBR|1|12345670^Emergency|PUS0300666^Micro|87040^Microscopy and  
 Culture^C4|||||222221^NURSE^NANCY  
 |||||222222^PHYSICIAN^^^DR|||||||MB|F|||||444642&ROSCOP&Mike^200309081130  
 ORC|SC|12345670^Emergency||777^Emergency|CM|||200309060818|||||||Emergency  
 Ward^^^^^^FI^^EW00  
 OBX|1|CE|32761-9^Leukocytes^LN||value||N||F||200309060830  
 3030 OBX|2|CE|32762-7^Epithelial Cells^LN||value||N||F||200309060830|333231^BACK^TERRY  
 OBX|3|CE|20430-5^Culture^LN||POS^Positive^L||N||F||200309070935|...  
 |333231^BACK^TERRY  
 OBR|2|12345685^Emergency|PUS03006661^Micro|87072^Organism  
 Identification^C4|||||||MB|F|||||444642&ROSCOP&Mike^200309081130  
 3035 ORC|SC|12345685^Emergency||777^Emergency|CM|||200309070941|333231^BACK^TERRY|||||||  
 ||Emergency Ward^^^^^^FI^^EW00  
 OBX|1|ST|21020-3^Micro organism identified^LN|1|Staph Aureus||N||F||200309080830|...  
 OBR|3|12345686^Emergency|PUS03006662^Micro|87186^Antibiotic  
 Susceptibility^C4|||||||MB|F|21020-3&Micro organism  
 3040 identified&LN^1^Staph Aureus||  
 12345685&Emergency|PUS03006661&Micro||444642&ROSCOP&Mike^200309081130  
 ORC|SC|12345686^Emergency||777^Emergency|CM|||200309070938|333231^BACK^TERRY|||||||  
 ||Emergency Ward^^^^^^FI^^EW00  
 3045 OBX|1|SN|18928-2^Gentamicin^LN|1|value|ug/ml||S||F||200309080830|...  
 OBX|2|SN|18996-9^Tobramycin^LN|1|value|ug/ml||R||F||200309080830|...  
 OBX|3|SN|18954-8^Netilmicin^LN|1|value|ug/ml||S||F||200309080830|...  
 OBX|4|SN|18959-7^Ofloxacin^LN|1|value|ug/ml||S||F||200309080830|...  
 OBX|5|SN|18917-5^Doxycycline^LN|1|value|ug/ml||S||F||200309080830|...  
 3050 OBX|6|SN|19000-9^Vancomycin^LN|1|value|ug/ml||S||F||200309080830|...  
 OBX|7|SN|18974-6^Rifampicin^LN|1|value|ug/ml||S||F||200309080830|...  
 OBX|8|SN|25596-8^Fosfomycine^LN|1|value|ug/ml||S||F||200309080830|...

The related acknowledgement message isn't shown.

## 4.6 Rejection of a Specimen

### 3055 4.6.1 Storyboard

This example corresponds to the use case described in Volume 1 as “4.2.4 Order Filler rejects a specimen prior to result testing”. The context for this use-case will be based on the simplification of having the actors OP and ORT grouped.

3060 A physician in a ward requests a laboratory test “BG\_CLAIR\_CREAT\_COCKROFT” for a patient “Marge Smith”.

The Order Placer sends a LAB-1 “order create” message to the Order Filler, delivering the Order Group “2011122446\_OPGN” with associated relevant information including a Specimen with bar coded id = “1200000808”

3065 Upon reception, the Order Filler application accepts the content of the Order, and notifies a Filler Order Number in the acknowledgement message sent back to the Order Placer application.

Using the Order Filler application, the laboratory staff checks each Order with the corresponding specimens and detects a non-conformity for a particular specimen: “1200000808”. The specimen will be cancelled in the Order Filler application. During the cancelation of the specimen, a reason will be asked to allow feedback towards a Nurse or the Physician.

3070 This action will also lead to the cancelation of the related laboratory test.

The Order Filler informs the Order Placer / Order Result Tracker about the rejection executing the laboratory test

A nurse or the Physician detects this non-conformity and decides to take a new specimen sample from the patient to enable the laboratory fulfilling the laboratory test.

3075 The Order Placer will inform the Order Filler about this new Specimen with new barcode id = “1200000809” and re-order the laboratory test within the already existing Order Group.

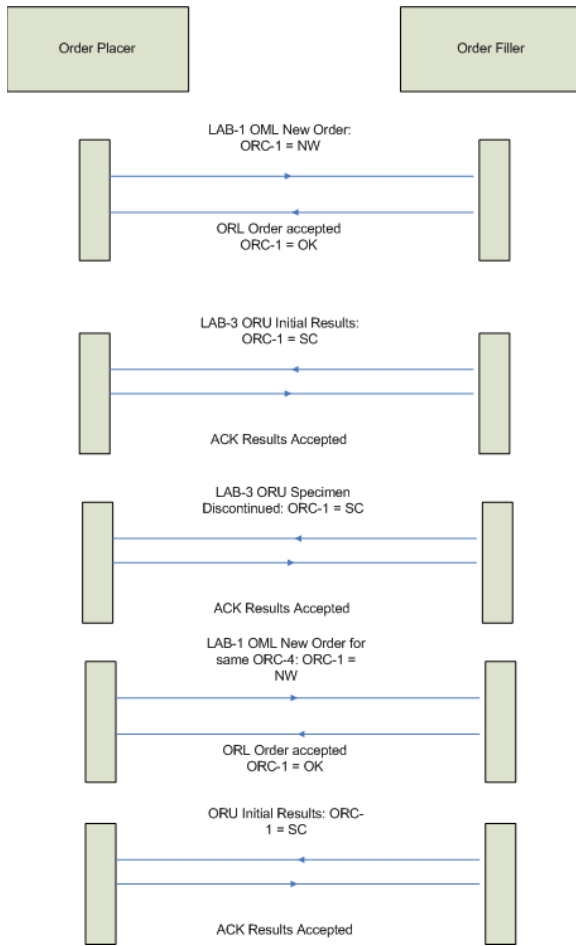
The Order Filler will update the Order Group and provide a status feedback to the Order Result Tracker informing about the new work for this new specimen.

3080

3085

### 4.6.2 Interaction Diagram

3090



### 4.6.3 Messages

#### 4.6.3.1 LAB-1 (OP -> OF): Message "Create new order"

3095

```
MSH|^~\&|||APHP_CORDIER|20111213174100||OML^O21^OML_O21|391815247250212427|P|2.5|||
```

```
PID|1||7501052489^^^PSL||Smith^Marge^^^Mrs||19641120|F|||^AMAREINS FRANCHELEINS  
CESSEINS^^01090^100
```

3100

```
PV1|I|||||JCO000407|||||20120203101100|||||V  
ORC|NW|2011122446_OP1^APHP||2011122446_OPGN^APHP|SC|||20111213173234||0607^Hart^Andr  
e^^^Dr^hcpr|0607_N^MIPSN|||S_CORDIER^BIOCH_HEMATO^L
```

```
TQ1|||||R
```

```
OBR|1|2011122446_OP1^APHP|APHP_CREA_COCKROFT^APHP|||0607^Hart^Andre^^^Dr^h  
cpr|||||S_CORDIER|S
```

3105

```
SPM|1|1200000808&PSL|MAT_HEPLIG_PLA^Plasma sur tube héparine lithium avec  
gel^L^APHP_HEPLIG_PLA^APHP|||||0.0^ml&&L|||||20120210101100|||
```

With:

3110

```
Order Group number (ORC) = 2011122446_OPGN  
Order Placer number (ORC) = 2011122446_OP1  
Order Placer assigned specimen number (SPM) = 1200000808
```

The related acknowledgement message isn't shown.

3115 **4.6.3.2 LAB-3 (OF -> ORT/OP) : Acceptance of the order**

```
MSH|^~\&|PSL|E_BG_CORDIER|ORBIS|ResultImport|20120209112212||ORU^R01^ORU_R01|303900235
622598969|P|2.5|||BEL|8859/1|EN
PID|1||7501052489^^^PSL||Smith^Marge||19641120|F
PV1|I|||JCO000407|||20120203101100|||V
3120 ORC|SC|2011122446_OP1^ORBIS|41498^PSL|2011122446_OPGN^ORBIS|SC|||20120209111827||060
7_N^BIOCHIMIE^^^^dept^MIPSN|0607|||S_CORDIER^BIOCH_HEMATO^L
OBR|1|2011122446_OP1^ORBIS|41498^PSL|BG_CLAIR_CREAT_COCKROFT^Clairance créat
Cockroft^L^APHP_CREA_COCKROFT^^APHP||20120210101100|||0607_N^BIOCHIMIE^^^^dept
3125 t^MIPSN|||S_CORDIER|S
TQ1|||R
SPM|1|1200000808&ORBIS^1200000808&PSL||MAT_HEPLIG_PLA^Plasma sur tube héparine lithium
avec gel^L^APHP_HEPLIG_PLA^^APHP|||0.0^ml&&L|""||20120210101100||N
```

With:

```
3130 Order Group number = 2011122446_OPGN
Order Placer number = 2011122446_OP1
Order Filler number = 41498
Order Placer assigned specimen number = 1200000808
Order Filler assigned specimen number = 1200000808
```

3135

The related acknowledgement message isn't shown.

**4.6.3.3 LAB-3 (OF -> ORT/OP) : Rejection of a specimen**

```
3140 MSH|^~\&|PSL|E_BG_CORDIER|ORBIS|ResultImport|20120209122308||ORU^R01^ORU_R01|469731566
7455003249|P|2.5|||BEL|8859/1|EN
PID|1||7501052489^^^PSL||Smith^Marge||19641120|F
PV1|I|||JCO000407|||20120203101100|||V
3145 ORC|SC|2011122446_OP1^ORBIS|41498^PSL|2011122446_OPGN^ORBIS|CA|||20120209111827||060
7_N^BIOCHIMIE^^^^dept^MIPSN|0607|||S_CORDIER^BIOCH_HEMATO^L
OBR|1|2011122446_OP1^ORBIS|41498^PSL|BG_CLAIR_CREAT_COCKROFT^Clairance créat
Cockroft^L^APHP_CREA_COCKROFT^^APHP||20120210101100|||0607_N^BIOCHIMIE^^^^dept
3150 t^MIPSN|||S_CORDIER|X
TQ1|||R
SPM|1|1200000808&ORBIS^1200000808&PSL||MAT_HEPLIG_PLA^Plasma sur tube héparine lithium
avec
3155 gel^L^APHP_HEPLIG_PLA^^APHP|||0.0^ml&&L|""||20120210101100|20120209113217|N^N
on Conformite
OBX|1|ST|POIDS^Poids du patient^L^A1652^^APHP||Non
Conformite|kg^L||N~N||X||20120210101100|E_BG_CORDIER^BIOCH_URG_CORDIER^L|^L|INTEG
3155 RA_01^L|20120209121943
OBX|2|ST|CREAT^Créatinine^L^A0094^^APHP||Non Conformite|µmol/l^L|44-
80|N~N||X||20120210101100|E_BG_CORDIER^BIOCH_URG_CORDIER^L|^L|INTEGRA_01^L|2012020
9121943
3160 OBX|3|ST|CLCOCK^Clairance Créatinine Cockroft^L^A2154^^APHP||Non
Conformite|ml/min^L||N~N||X||20120210101100|E_BG_CORDIER^BIOCH_URG_CORDIER^L|^L|C
ALCUL_BG^L|20120209121942
```

With:

```
3165 Placer Group number = 2011122446_OPGN
Order Placer number = 2011122446_OP1
```

Order Placer assigned specimen number = 1200000808  
Specimen Availability (SPM-20) = N  
Specimen Reject Reason (SPM-21) = Non Conformite

3170 The related acknowledgement message isn't shown.

#### 4.6.3.4 LAB-1 (OP->OF): 'New Order' with a new specimen for the same order group

3175 MSH|^~\&|PSL|E\_BG\_CORDIER|ORBIS|ResultImport|20120209140214||**ORU^R01^ORU\_R01**|537296337  
8993344693|P|2.5|||||BEL|8859/1|EN  
PID|1||7501052489^^^PSL||Smith^Marge||19641120|F  
PV1||I|||||JCO000407|||||20120203101100|||||v  
ORC|SC|**2011122447\_OP1^ORBIS**|41499^PSL|**2011122446\_OPGN^ORBIS**|SC|||20120209123701|||060  
7\_N^BIOCHIMIE^^^^^dept^MIPSN|0607|||S\_CORDIER^BIOCH\_HEMATO^L  
3180 OBR|1|**2011122447\_OP1^ORBIS**|**41499^PSL**|BG\_CLAIR\_CREAT\_COCKROFT^Clairance créat  
Cockroft^L^APHP\_CREA\_COCKROFT^^APHP||20120210101100|||||0607\_N^BIOCHIMIE^^^^^dep  
t^MIPSN|||||S\_CORDIER|S  
TQ1|||||R  
3185 SPM|1|1200000809&ORBIS^1200000809&PSL||MAT\_HEPLIG\_PLA^Plasma sur tube héparine lithium  
avec gel^L^APHP\_HEPLIG\_PLA^^APHP|||||0.0^ml&&L|""||20120210101100|||**N**

With:

Order group number = 2011122446\_OPGN  
Order Placer number = 2011122447\_OP1  
3190 Order Placer assigned specimen number = 1200000809

The related acknowledgement message isn't shown.