IHE International



**Integrating the Healthcare Enterprise**

**Laboratory Technical Framework, CPOE compliancy**

**Volume 2 (LAB TF-2) Transactions**

Based on Revision 5

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Table of Contents

[0 versions 6](#_Toc49319439)

[Specific for version 01.1 6](#_Toc49319440)

[Specific for version 02 6](#_Toc49319441)

[Specific for version 03 6](#_Toc49319442)

[Specific for version 04 6](#_Toc49319443)

[Specific for version 05 7](#_Toc49319444)

[Specific for version 06 7](#_Toc49319445)

[Specific for version 07 7](#_Toc49319446)

[Specific for version 08 7](#_Toc49319447)

[Specific for version 09 7](#_Toc49319448)

[1 Introduction 8](#_Toc49319449)

[1.1 Overview of the documentation 8](#_Toc49319450)

[1.3 Audience 8](#_Toc49319451)

[1.4 Relationship to Standards 8](#_Toc49319452)

[1.7 Comments 9](#_Toc49319453)

[3 Common HL7 Message Segments for IHE LAB TF 10](#_Toc49319454)

[3.1 MSH - Message Header Segment 13](#_Toc49319455)

[3.2 NTE - Notes and Comment Segment 14](#_Toc49319456)

[3.3 PID - Patient Identification Segment 14](#_Toc49319457)

[3.4 PV1 - Patient Visit Segment 14](#_Toc49319458)

[3.5 ORC Common Order Segment 16](#_Toc49319459)

[3.6 TQ1 - Timing Quantity Segment 18](#_Toc49319460)

[3.7 SPM - Specimen Segment 19](#_Toc49319461)

[3.8 SAC Container Detail Segment 21](#_Toc49319462)

[3.9 OBX - Observation/Result Segment 22](#_Toc49319463)

[3.11 Microbiology reporting rules 22](#_Toc49319464)

[3.13MFI – Master File Identification segment 25](#_Toc49319465)

[3.14MFE – Master File Entry Segment 25](#_Toc49319466)

[4 Transaction LAB-1: Placer Order Management 26](#_Toc49319467)

[4.1 SUPPORTED USE CASES IN LAB-1 26](#_Toc49319468)

[Use Case 1 : Normal Process of a Placer Order 26](#_Toc49319469)

[Use Case 2: Cancellation of an Order by the Order Placer 27](#_Toc49319470)

[Use Case 3: Cancellation of an Order initiated by the Order Filler 27](#_Toc49319471)

[Use Case 4: CPOE-specific: A multi-LIS DOMAIN environment 27](#_Toc49319472)

[USE CASE 5: Status change of an order by the order placer 28](#_Toc49319473)

[USE CASE: ORDER MODIFICATION by the order placer 29](#_Toc49319474)

[Other points 29](#_Toc49319475)

[Supported Events 29](#_Toc49319476)

[LAB-1 29](#_Toc49319477)

[Supported segments 31](#_Toc49319478)

[Static message definition for transaction LAB-1 OML^O21 32](#_Toc49319479)

[MSH Segment 33](#_Toc49319480)

[PID Segment 34](#_Toc49319481)

[PV1 Segment 34](#_Toc49319482)

[ORC Segment – Common order 36](#_Toc49319483)

[TQ1 Segment – Timing Quantity 37](#_Toc49319484)

[OBR Segment – Observation Request 37](#_Toc49319485)

[NTE Segment – Notes and Comments 38](#_Toc49319486)

[OBX Segment – Observation Result 39](#_Toc49319487)

[SPM Segment – Specimen 39](#_Toc49319488)

[Static message definition for ORL^O22 42](#_Toc49319489)

[General 42](#_Toc49319490)

[MSH Segment 42](#_Toc49319491)

[MSA Segment – Message Acknowledgement 43](#_Toc49319492)

[ERR Segment – Error Segment 43](#_Toc49319493)

[ORC Segment – Common order 43](#_Toc49319494)

[OBR Segment – Observation Request 44](#_Toc49319495)

[SPM Segment – Specimen 44](#_Toc49319496)

[6. Transaction LAB-3: Order Results Management 45](#_Toc49319497)

[Supported Use Cases in LAB-3 45](#_Toc49319498)

[Use Case 1 : Normal Process for management of Results of a Filler Order 45](#_Toc49319499)

[Use Case 2 : Deletion of a Battery/Test in a Filler Order 46](#_Toc49319500)

[Use Case 3: CPOE-specific: A multi-domain environment of LABO’s 46](#_Toc49319501)

[Other points 47](#_Toc49319502)

[Supported Message Profiles 47](#_Toc49319503)

[LAB-3 47](#_Toc49319504)

[Supported segments 48](#_Toc49319505)

[Static message definition for transaction LAB-3 ORU^R01 49](#_Toc49319506)

[MSH Segment 49](#_Toc49319507)

[PID Segment 50](#_Toc49319508)

[PV1 Segment 51](#_Toc49319509)

[ORC Segment – Common order 51](#_Toc49319510)

[OBR Segment – Observation Request 53](#_Toc49319511)

[TQ1 Segment – Timing Quantity 54](#_Toc49319512)

[OBX Segment – Observation Result 54](#_Toc49319513)

[NTE Segment – Notes and Comments 55](#_Toc49319514)

[SPM Segment – Specimen 56](#_Toc49319515)

[Acknowledge messages 56](#_Toc49319516)

[MSH Segment 57](#_Toc49319517)

[MSA Segment – Message Acknowledgement 57](#_Toc49319518)

[ERR Segment – Error Segment 57](#_Toc49319519)

[Special Use cases – Degraded Modes 57](#_Toc49319520)

[Use case 1: Degraded mode : ORBIS/BPE is down. 58](#_Toc49319521)

[Use case 2: Degraded MODE: LIS is down. 58](#_Toc49319522)

[Use case 3: When the IPP (Patient identification) is unknown to ORBIS 58](#_Toc49319523)

[Use case 5 : Microbiology Result Reporting 58](#_Toc49319524)

[Use case 6 : Graphical result reporting 58](#_Toc49319525)

[18 Transaction LAB-51: Laboratory Code Set Management 60](#_Toc49319526)

[Guide of use 60](#_Toc49319527)

[CPOE guideline for semantic interpretation of one TEST/SERVICE/OBSERVATION/BATTERY. 60](#_Toc49319528)

[Supported transactions & actors 62](#_Toc49319529)

[Supported Events 62](#_Toc49319530)

[LAB-51 62](#_Toc49319531)

[Supported segments 65](#_Toc49319532)

[Static message definition for MFN^M08 66](#_Toc49319533)

[MSH Segment 66](#_Toc49319534)

[MFI Segment 67](#_Toc49319535)

[MFE Segment 68](#_Toc49319536)

[OM1 Segment – General Segment 69](#_Toc49319537)

[OM2 Segment – Numeric Observation Segment 73](#_Toc49319538)

[OM4 Segment – Observations that require specimens 73](#_Toc49319539)

[Static message definition for MFN^M09 75](#_Toc49319540)

[MSH Segment 75](#_Toc49319541)

[MFI Segment 76](#_Toc49319542)

[MFE Segment 76](#_Toc49319543)

[OM1 Segment – General Segment 76](#_Toc49319544)

[OM3 Segment - Categorical Service/Test/Observation Segment 76](#_Toc49319545)

[OM4 Segment 77](#_Toc49319546)

[Static message definition for MFN^M10 78](#_Toc49319547)

[MSH Segment 78](#_Toc49319548)

[MFI Segment 79](#_Toc49319549)

[MFE Segment 79](#_Toc49319550)

[OM1 Segment – General Segment 79](#_Toc49319551)

[OM5 Segment – Observation Batteries (Sets) Segment 80](#_Toc49319552)

[Static message definition for MFN^M12 81](#_Toc49319553)

[OM7 Segment – Additional Basic ATTRIBUTES 81](#_Toc49319554)

[~~Static message definition for MFN^M04 : NOT SUPPORTED YET~~ 82](#_Toc49319555)

[~~MSH Segment~~ 82](#_Toc49319556)

[~~SFT Segment (not needed)~~ 83](#_Toc49319557)

[~~MFI Segment~~ 83](#_Toc49319558)

[~~MFE Segment~~ 83](#_Toc49319559)

[~~CDM Segment~~ 84](#_Toc49319560)

[~~PRC Segment~~ 84](#_Toc49319561)

[Use cases 85](#_Toc49319562)

[Use case 1 : How new master files affect the end-user workflow and administrative work for ORBIS maintenance. 85](#_Toc49319563)

[Use case 2 : Modeling example for dynamic tests. 85](#_Toc49319564)

[Use case 3 : Modeling example for microbiology/bacteriologie tests. 86](#_Toc49319565)

[Use case 3.1 : modeling a complex clinical observation like ‘localisation’ 86](#_Toc49319566)

[Use case 3.2 : semantic annotation for certain clinical observations that need to be mapped to specific interface fields like ‘specimen source site’. 87](#_Toc49319567)

[Use Case 4: mODELING tEsts THAT ARE REFERENCED BY OTHER TESTS and relation with header creation 87](#_Toc49319568)

[Acknowledge messages 89](#_Toc49319569)

[MSH Segment 89](#_Toc49319570)

[MSA Segment – Message Acknowledgement 90](#_Toc49319571)

[*ERR Segment – Error Segment* 90](#_Toc49319572)

[MFI Segment 90](#_Toc49319573)

[MFA Segment 91](#_Toc49319574)

[Extensive list of all use cases with messages 92](#_Toc49319575)

# 0 versions

**Version 1.1 – 05/08/2011**

**Version 2.0 – 10/01/2012**

**Version 3.0 – 12/02/2015**

**Version 4.0 – 20/04/2018**

**Version 5.0 – 15/01/2020**

**Version 6.0 – 06/08/2020**

**Version 7.0 – 06/08/2020**

**Version 8.0 – 10/08/2020   
Version 37.00 13/01/2023 Correct the length of OM4-3 in case it is seen as a CE**

## Specific for version 01.1

Changed ORC-segment, ORC-1 field in LAB-1

|  |  |  |
| --- | --- | --- |
| SC | “Status changed” | Y |

Support of ORC-1 status SC in case of some specimen updates

We will support ORC-1 with status SC in OML LAB-1 messages when there is only a collection or rejection done for an existing specimen linked to an OBR.

When an ORC-1 is sent with status SC, only the following fields can change

* SPM-17 as specimen date/time of collection
* An OBX can be added to an OBR as a clinical observation filled in by the nurse. No date/time of execution is filled in. All OBX’es are linked to the OBR level. (linked to the test).
* SPM-14 as a specimen specific comment by the nurse
* SPM-20 as availability information. Can be set to N when specimen was not collected. It will not become available anymore to LIS

The SC status is not used when the physician updated the order.

Constraint: The first time a message is sent to the Order Filler (LIS), it will always be with a status NW,

no matter how much detail information on what level is already provided.

## Specific for version 02

Added supported scenario’s for microbiology result reporting. See new chapter 3.11.

Added extra information regarding the need for LCSD profile, see chapter 18, guide of use

## Specific for version 03

Updated details to be compatible with LAB-TF version 5.

## Specific for version 04

Described how a clinical observation is semantically tagged as SPM-7, SPM-10, SPM-14. Removed that SPM-16 can be semantically tagged. This will be supported for future versions.

## Specific for version 05

Updated a typo

## Specific for version 06

Checked again the content for OM1-7. Corrected some typo’s

## Specific for version 07

Added remark that the possible answer is auto selected if there is only 1 possible answer.

## Specific for version 08

Changed address for feedback. Removed the address of Peter Baeke

## Specific for version 09

Agfa name change

# 1 Introduction

## 1.1 Overview of the documentation

This document describes the compliancy & support from CPOE on profiles, user actors and transactions of the IHE Lab TF.

CPOE made 2 filtered documents with a similar structure as the original IHE documents:

|  |  |
| --- | --- |
|  |  |
| **CPOE doc** | **Maps to IHE doc** |
| CPOE\_ihe\_lab\_TF\_Vol1.pdf | IHE\_LAB\_TF\_Vol1 |
| CPOE\_ihe\_lab\_TF\_Vol2.pdf | IHE\_LAB\_TF\_Vol2 (all sub volumes) |
| No CDS functionality supported yet | IHE\_LAB\_TF\_Vol3 |

This specific document describes Vol2.

We use a similar document hierarchy as in the IHE file.

Common segments, unlike the ihe document, are duplicated for eacht transaction, to make small differences in how fields need to be filled in more explicit

Detailed HL7 fields in the message segments omitted are not supported or not relevant for CPOE.

## 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.
* Experts involved in standards development
* Anyone interested in the technical aspects of integrating healthcare information systems.

## 1.4 Relationship to Standards

CPOE intends to fully comply with the IHE laboratory profiles, user actors and transactions it subscribes to, necessary to support our applications & workflows.

Where the current standard of the technical framework is not sufficient for our intended customer functionality, CPOE proposes CP extensions to the IHE framework, rather than starting customization activity with one particular vendor or customer.

If the current standard leaves room for interpretation or further choices, CPOE’s interpretation will be explicitly formulated in this document, in order to improve efficient solution integration with customers and vendors. Wherever possible, CP’s will be formulated and proposed to IHE to limit interpretation or reach a more common understanding.

If any non-compliance to IHE is found, we will always work towards the standard wherever possible.

If any non-compliance to IHE is found in third party messages, we will equally ask for modifications towards the standard wherever possible.

## 1.7 Comments

Comments on this document are always welcome.

<mailto:Patricia.Sierens@dedalus-group.com>

# 3 Common HL7 Message Segments for IHE LAB TF

The common segments used in LAB-1 and LAB-3 are repeated in their own chapter, in order to provide more details on small differences of the use of the fields.

Common segments are: MSH, NTE, PID, PV1, ORC, TQ1, SPM, OBX, MFI, MFE.

The SAC segment is not supported by CPOE : it does not support any needed functionality in our OP or ORT workflows today.

Tables in this document will represent details of segments

All fields mentioned in the tables are supported by CPOE. If the field is not mentioned, it is not supported.

Supported fields can be any of the following types:

* A field or subfield is of type R(equired), RE(Required when available), or C(conditional) in IHE or HL7. In this case, CPOE supports the field because it is mandatory for IHE. If the condition or availability of a C or RE field is relevant for the CPOE actors, we will specify.
* A field or subfield is O(ptional) in IHE or HL7, but is needed to support the necessary workflow for our customers. In this case, we will highlight these fields, as we also require from other vendors that these fields are supported, if they commit to the same customer workflow.

If a field is of this type, we will always propose a CP to IHE to take it up in a future version of the official recommendation.

The field will also change from type O(optional) to R,RE or C as a further restriction.

* A field or subfield is O(ptional) in IHE or HL7, and CPOE does not use or do anything with it in the application. In this case, there will be no mention of it in the table or description.

Below the tables are commented only the fields for which CPOE brings some extra precision on usage on top of IHE. Fields without extra comments are considered trivial HL7 standard knowledge.

Parsing of all imported messages (ORU, ORL):

* All R fields not provided in the messages will result in a rejection of the message. It means the message is not IHE conform.
* Patient id and patient case id information is checked on content. If we do not find the patient or case information in ORBIS, we will reject the message for patient safety reasons.
* All other fields are not rejected based on content, except when explicitly mentioned in the specific field in this spec. This means, let’s say that a field has to be filled with an employee code, then we will look up the employee code in the ORBIS database. Failure to find the employee code will not result in a rejected message, because our guideline is to is that it is more important to show the results without the link to some persons, than to reject the message and not show the results at all.
* Failure to find corresponding employees/physicians/organizational units can result in loss of functionality.
  + For example, if the requesting department in the message cannot be found in our system, the worklist entry to show the result in the available results for the requesting department will not be filled. To make sure there is no risk not seeing the result, results are always visible in the cumulative viewer and can always be shown in the KG central.
  + For example, not having the responsible biologist linked to an employee in ORBIS will result in failure to check the VIP functionality: results for VIP tests are only visible to the requesting physician, but if the requesting physician in the ORU message cannot be traced to an ORBIS user/employee, then we cannot verify the person in the message is the requesting physician in the ORBIS system.

Common Interface configuration parameters in ORBIS’s BPE

For LAB-1:

|  |  |  |
| --- | --- | --- |
| SKIP\_SPM | 0 | NO SPM segments are sent out in oml out message |
| 1 | SPM segments are added to the oml out message |

|  |  |  |
| --- | --- | --- |
| SPECIMEN\_SOURCE\_COLLECTION\_DATA\_LOCATION | SPM | Send out results for clinical observation -linked to SPM 7/8/9/10/14 (=location)- in the SPM segment |
| OBX | Send out results for clinical observation -linked to SPM 7/8/9/10/14 (=location) - in an OBX segment |

|  |  |  |
| --- | --- | --- |
| PID\_NAMESPACE\_INTERNAL | - | (default) |
| Value as in the message (PID segement) e.g. APHP |  |

For LAB-3:

|  |  |  |
| --- | --- | --- |
| RESULT\_INVALIDATION\_MODE | PRODUCER\_LEVEL | Invalidation will be done for all previously sent results for the same producer (MSH-3). |
| ORDERFILLER\_LEVEL | (default) Invalidation of previously sent results for a particular ORC-3, only occurs when the same ORC-3 was recieved |
| DISABLED | no invalidations should occur. |

|  |  |  |
| --- | --- | --- |
| PATIENT\_SAFETY\_CHECK\_LEVEL | ORDER\_RESULT\_CHECK | Message goes in error if the case of the message does not match the case of the order in a previous message |
| PATIENT\_CASE\_CHECK | The order is only updated to the case of the message (if it differs from what was sent before) if the case belongs to the same patient in the previous sent message |
| OFF | No checks are done. The order is always updated to the patient and case of the message |

|  |  |  |
| --- | --- | --- |
| PID\_NAMESPACE\_INTERNAL | - | (default) |
| Value as in the message (PID segment) e.g. APHP |  |
| RELATIVEPATH\_FOR\_RP | DEFAULT\_RELATIVE\_PATH\_NOT\_SET | Goes in error |
|  | Path to the file | This parameter can be used to prefix the path in the OBX-5 (reference to the report file). This way OBX-5 can contain a partial path to the file, the rest is set via the property. Eg.1): RELATIVEPATH\_FOR\_RP=C:\\SomeExistingFolder\\ OBX-5=FileName.pdf The location used for retrieving the file will be: C:\SomeExistingFolder\FileName.pdf Eg.2): RELATIVEPATH\_FOR\_RP=C:/SomeExistingFolder/ OBX-5=someExistingSubFolder/FileName.pdf The location used for retrieving the file will be: C:\SomeExistingFolder\someExistingSubFolder\FileName.pdf  OBX-5 values MAY also be prefixed with one of the following values: file://, file:/, file:, FILE://, FILE:/ or FILE:  Also drive mappings can be used here instead of local disk drives. If the property is left to it's default (DEFAULT\_RELATIVE\_PATH\_NOT\_SET) then you must specify a complete path reference to the filename via the OBX-5. |

## 3.1 MSH - Message Header Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 1 | SI | R | [1..1] |  | 00001 | Field Separator |
| 2 | 4 | ST | R | [1..1] |  | 00002 | Encoding Characters |
| 3 | 227 | HD | R | [1..1] |  | 00003 | Sending Application |
| 4 | 227 | HD | R | [1..1] |  | 00004 | Sending Facility |
| 5 | 227 | HD | R | [1..1] |  | 00005 | Receiving Application |
| 6 | 227 | HD | R |  |  | 00006 | Receiving Facility |
| 7 | 26 | TS | R | [1..1] |  | 00007 | Date/Time of Message |
| 9 | 15 | MSG | R | [1..1] |  | 00009 | Message Type |
| 10 | 20 | ST | R | [1..1] |  | 00010 | Message Control Id |
| 11 | 3 | PT | R | [1..1] |  | 00011 | Processing Id |
| 12 | 60 | VID | R | [1..1] |  | 00012 | Version ID |
| 17 | 3 | ID | RE | [1..1] | 0399 | 00017 | Country Code |
| 18 | 16 | ID | C | [0..1] | 0211 | 00692 | Character Set |
| 19 | 250 | CE | RE | [1..1] |  | 00693 | Principal Language of Message |
| 20 | 20 | ID | C | [0..1] | 0356 | 01317 | Alternate Character Set Handling Scheme |
| 21 | 427 | EI | RE | [0..\*] |  | 01598 | Message Profile Identifier |

**Table 3.1-1: MSH - Message Header, supported by CPOE**

## 3.2 NTE - Notes and Comment Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 4 | SI | R | [1..1] |  | 00096 | Set ID – NTE |
| 2 | 8 | ID | RE | [0..1] |  | 00097 | Source of Comment |
| 3 | 65536 | FT | RE | [0..1] |  | 00098 | Comment |
| 4 | 250 | CE | RE | [0..1] |  | 01318 | Comment Type |

**Table 3.3-1: NTE - Notes and Comment segment, supported by CPOE**

## 3.3 PID - Patient Identification Segment

The use of the PID segment described here is limited to the context of the transactions supported by CPOE actors. This means, in our transactions as OP or ORT, the primary target for PID is identifying the patient, not transmitting all information known to that patient.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 3 | 250 | CX | R | [1..\*] |  | 00106 | Patient Identifier List |
| 5 | 250 | XPN | R | [1..\*] |  | 00108 | Patient Name |
| 7 | 26 | TS | RE | [0..1] |  | 00110 | Date/Time of Birth |
| 8 | 1 | IS | R | [1..1] | 0001 | 00111 | Administrative Sex |
| 10 | 250 | CE | RE | [0..1] | 0005 | 00113 | Race |
| 11 | 250 | XAD | RE | [0..\*] |  | 00114 | Patient Address |
| 18 | 250 | CX | RE | [0..1] |  | 00121 | Patient Account Number |
| 31 | 1 | ID | RE | [0..1] | 0136 | 01535 | Identity Unknown Indicator |
| 32 | 20 | IS | RE | [0..1] | 0445 | 01536 | Identity Reliability Code |
| **35** | **250** | **CE** | **X** | **[0..1]** | **0446** | **01539** | **Species Code** |
| **36** | **250** | **CE** | **X** | **[0..1]** | **0447** | **01540** | **Breed Code** |

**Table 3.4-1 : PID - Patient Identification segment, supported by CPOE**

**PID-18**:equals **PV1-19**

**PID-35, PID-36**: CPOE currently does not support OP & ORT for non-living subjects, so condition is not met. Therefore, IHE Usage C is changed to X as CPOE limitation.

## 3.4 PV1 - Patient Visit Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 2 | 1 | IS | R | [1..1] | 0004 | 00132 | Patient Class |
| 3 | 80 | PL | RE | [0..1] |  | 00133 | Assigned Patient Location |
| 19 | 250 | CX | RE | [0..1] |  | 00149 | Visit Number |
| 51 | 1 | IS | C | [0..1] | 0326 | 01226 | Visit Indicator |

**Table 3.5-1: PV1 - Patient Visit segment, supported by CPOE**

**PV1-3:** CPOE functionally does not use this field in any use case, but we do support the field is filled when available to be IHE compatible.

## 3.5 ORC Common Order Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 2 | ID | R | [1..1] | 0119 | 00215 | Order Control |
| 2 | 22 | EI | C | [0..1] |  | 00216 | Placer Order Number |
| 3 | 22 | EI | C | [0..1] |  | 00217 | Filler Order Number |
| 4 | 22 | EI | RE | [0..1] |  | 00218 | Placer Group Number |
| 5 | 2 | ID | C | [0..1] | 0038 | 00219 | Order Status |
| 8 | 200 | EIP | C | [0..1] |  | 00222 | Parent |
| 9 | 26 | TS | R | [1..1] |  | 00223 | Date/Time of Transaction |
| 10 | 250 | XCN | RE | [0..\*] |  | 00224 | Entered By |
| 11 | 250 | XCN | RE | [0..\*] |  | 00225 | Verified By |
| 13 | 80 | PL | O |  |  | 00227 | Enterer’s Location |
| 17 | 250 | CE | C | [0..1] |  | 00231 | Entering Organization |
| 27 | 26 | TS | **X** | [0..1] |  | 01642 | Filler's Expected Availability Date/Time |
| 29 | 250 | CWE | RE | [0..1] |  | 01643 | Order Type |

**Table 3.5-1 : ORC Segment, supported by CPOE**

**ORC-1 Order Control (ID)**, required.

Explanation for column active support:

* A indicates that CPOE actively sends out this status.
* P indicates that CPOE passively supports this status by showing it in feedback or status forms.
* N indicates not currently supported

|  |  |  |
| --- | --- | --- |
| **Value** | **Description of use** | **Active/Passive support** |
| NW | “New Order”. | A |
| OK | “Notification or request accepted”. | P |
| UA | “Unable to accept order/service” | P |
| SC | “Status changed” | A |
| CA | “Cancel order/ service request”. | A |
| CR | “Canceled as requested”. | P |
| UC | “Unable to cancel”. | P |
| OC | “Order service canceled”. | P |
| SN | “Send order/service number” | N |
| NA | “Number assigned” | N |
| RP | “Order/service replace request”. | P |
| RQ | “Replaced as requested”. | P |
| UM | “Unable to replace”. | P |
| RU | “Replaced unsolicited”. | P |
| XO | “Change order/service request”. | A |
| XR | “Changed as requested”. | P |
| UX | “Unable to change” | P |
| PR | “Previous results with new order/service” | N |

**Subset of HL7 table 0119 – Order Control Codes supported by CPOE**

**Specific for status SC**

Support of ORC-1 status SC in case of some specimen updates

We will support ORC-1 with status SC in OML LAB-1 messages when there is only a collection or rejection done for an existing specimen linked to an OBR.

When an ORC-1 is sent with status SC, only the following fields change:

* SPM-17 as specimen date/time of collection
* An OBX can be added to an OBR as a clinical observation filled in by the nurse. No date/time of execution is filled in. All OBX’es are linked to the OBR level. (linked to the test).
* SPM-14 as a specimen specific comment by the nurse
* SPM-20 as availability information. Can be set to N when specimen was not collected. It will not become available anymore to LIS

The SC status is not used when the physician updates the order.

The original order is canceled and recreated new again with new Order Group and Order Numbers.

Constraint: The first time a message is sent to the Order Filler (LIS), it will always be with a status NW, no matter how much detail information on what level is already provided.

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

An order in IHE, and in CPOE, indicates one individual test/service/battery. What a physician orders as a whole is defined as an order group.

CPOE does not support customer formatting on this number. It does allow customer formatting on the placer group number.

**ORC-4 Placer Group Number (EI)**, required if known to the sender.

As OP, CPOE is master of this number. It allows formatting to the customer. This is the number mostly visible on order and result forms.

**ORC-13 Enterer’s Location (PL),** required if known to the sender.

1 subcomponent of this PL datatype will be filled with the code of the ward the requestor is logged in with at the time of order group validation

ORC-13.1 point of care IS

**ORC-17 Entering Organization (CE)**, conditional

CPOE currently chooses not to fill this field, as it is not used functionally.

**ORC-27 Fillers Expectable Availability Date/Time (TS)**, conditional.

CPOE currently changes this field from C to X, because it’s not supported on screen in our application.

## 3.6 TQ1 - Timing Quantity Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 7 | 26 | TS | C | [0..1] |  | 01633 | Start date/time |
| 9 | 250 | CWE | R | [1..1] | 0485 | 01635 | Priority |

**Table 3.6-1: TQ1 - Timing Quantity Segment, supported by CPOE**

**TQ1-7 Start date/time (TS)**, conditional

IHE indicates this field might be used to give an indication by OP on when labo tests should be started. But we have other fields like priority and planned collection date that trigger activity based on OP’s request. So as IHE also suggests, this field is filled with value ‘Non’ by CPOE.

**TQ1-9 Priority (CWE)**, required

IHE restricts the possible values to S, A, R, P, C, T.

CPOE further restricts possible values to A and R for now.

|  |  |  |
| --- | --- | --- |
| **Value** | **Description** | **Supported by CPOE** |
| S | Stat | N |
| A | ASAP | Y |
| R | Routine | Y |
| P | Preop | N |
| C | Callback | N |
| T | Timing critical | N |

**HL7 table 0485 - Priority codes**

## 3.7 SPM - Specimen Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 4 | SI | R | [1..1] |  | 01754 | Set ID – SPM |
| 2 | 80 | EIP | C | [0..1] |  | 01755 | Specimen ID |
| 3 | 80 | EIP | **X** | [0..1] |  | 01756 | Specimen Parent IDs |
| 4 | 250 | CWE | R | [1..1] | 0487 | 01900 | Specimen Type |
| 5 | 250 | CWE | C | [0..\*] |  | 01757 | Specimen Type Modifier |
| 7 | 250 | CWE | RE | [0..1] | 0488 | 01759 | Specimen Collection Method |
| 8 | 250 | CWE | **C** | [0..1] |  | 01901 | Specimen Source Site |
| 9 | 250 | CWE | **C** | [0..\*] | 0542 | 01760 | Specimen Source Site Modifier |
| 10 | 250 | CWE | **C** | [0..1] | 0543 | 01761 | Specimen Collection Site |
| 11 | 250 | CWE | RE | [0..\*] | 0369 | 01762 | Specimen Role |
| 14 | 250 | ST | O | [0..1] |  | 01764 | Specimen Description |
| 16 | 250 | CWE | **X** | [0..1] | 0489 | 01903 | Specimen Risk Code |
| 17 | 26 | DR | RE | [0..1] |  | 01765 | Specimen Collection Date/Time |
| 18 | 26 | TS | C | [0..1] |  | 00248 | Specimen Received Date/Time |
| 20 | 1 | ID | C | [0..1] | 0136 | 01766 | Specimen Availability |
| 21 | 250 | CWE | C | [0..\*] | 0490 | 01767 | Specimen Reject Reason |
| 26 | 4 | NM | RE | [0..1] |  | 01772 | Number of Specimen Containers |

**Table 3.7-1: SPM - Specimen Segment, supported by CPOE**

**SPM-2 Specimen ID (EIP)**, conditional.

Condition predicate:

In the context of use case “4.2.1, order placed with identified specimen”, CPOE fills the first component, “Placer Assigned Identifier” of datatype EI in transaction LAB-1.

In the context of use case “4.2.2, order placed with specimen identified by a third party, sub use case 4”, CPOE fills the first component in transaction LAB-1, depending on the customization of “in due time”. (See Vol1).

**SPM-3 Specimen Parent ID (EIP)**, required if available.

CPOE limits its current use from RE to X, as this is not part of the current offered functionality, thus the information is not available.

**SPM-4 Specimen Type (CWE)**, required.

IHE makes this a mandatory field in LAB-1 communication. For CPOE, this implies that the OP (either the physician at ordering time, or the nurse at sample collection time), needs to indicate the type for each specimen. CPOE supports all values listed in HL7 table 0487.

Filling this field can only be done automatically, without the physician or nurse manually entering the value, if and only if LCSD provides this information.

Therefore, CPOE will strongly recommend to customers and Code Set Master Actors to fill this optional field in LCSD.

**SPM-5 Specimen Type Modifier (CWE),** conditional,

**SPM-7 Specimen Collection Method (CWE)**, Required if available, **SPM-8 Specimen Source Site (CWE)**, conditional. ; **SPM-9 Specimen Source Site Modifier (CWE)**, conditional, **SPM-10 Specimen Collection Site (CWE)**, conditional.

**SPM-14 Specimen Description (ST)**, optional.

IMPORTANT:

* CPOE will fill SPM-14 in LAB-1 with the container description OM4-3 alongside the optionally configured OM1-7 tagged SPM-14 value in case LIS = LIP.
* CPOE will fill SPM-14 in LAB-1 with the optionally configured OM1-7 tagged SPM-14 value in case LIP=ORBIS (see below)

IHE recommends the OP to fill in these values when microbiology tests are ordered.

CPOE supports 2 ways of sharing this information in LAB-1 with OF:

* The information is sent as a clinical observation, as an OBX. In order to support this, the clinical observation must be linked to the matching lab tests in the LCSD in OM1-31.
* The information is also sent in the SPM-5, and/or 7 and/or 8 and/or 9 and/or 10 and/or 14 fields. In this case, we need to know that the clinical observation has the semantic meaning of a specimen collection method, specimen source site... We expect that OM1-7 (alternate identifier) specifies it as SPM-5, SPM-7, SPM-8, SPM-9, SPM-10, SPM-14.

This information in the LCSD specifically linked to certain tests is important so that we do not confront the user with specimen source site and source site modifier for all tests.

**SPM-11 Specimen Role (CWE)**, required if known by the sender, repeatable.

CPOE further restricts supported value to:

* “P” (patient, human or not)

**SPM-16 Specimen Risk Code (CWE), required if available.**

Currently not available in the OP application, so not supported. Usage is changed from RE to X.

**SPM-21 Specimen Reject Reason (CWE)**, conditional, repeatable.

All of the values in HL7 Table 0490 are passively supported

**SPM-26 Number of Specimen Containers (NM)**, required if available.

When LIS = LIP, this field is important for the OF to fill in to indicate one specimen id needs more than one container to be filled. Our guide for the OF is :

* We prefer that every container is identified with its own unique specimen id. This leads to unique tracing of every container, (fe can be relevant to trace which container broke), and better patient safety.
* If there are more containers with the same id, then the number of containers must be filled in this field, so that OP knows how many labels to print and prepare.

## 3.8 SAC Container Detail Segment

SAC segment currently not supported by CPOE.

## 3.9 OBX - Observation/Result Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 4 | SI | R | [1..1] |  | 00569 | Set ID – OBX |
| 2 | 2 | ID | C | [0..1] | 0125 | 00570 | Value Type |
| 3 | 250 | CE | R | [1..1] |  | 00571 | Observation Identifier |
| 4 | 20 | ST | C | [0..1] |  | 00572 | Observation Sub-ID |
| 5 | 99999 | Varies | C | [0..1] |  | 00573 | Observation Value |
| 6 | 250 | CE | C | [0..1] |  | 00574 | Units |
| 7 | 60 | ST | RE | [0..1] |  | 00575 | References Range |
| 8 | 5 | IS | RE | [0..1] | 0078 | 00576 | Abnormal Flags |
| 11 | 1 | ID | R | [1..1] | 0085 | 00579 | Observation Result Status |
| 13 | 20 | ST | C | [0..1] |  | 00581 | User Defined Access Checks |
| 14 | 26 | TS | RE | [0..1] |  | 00582 | Date/Time of the Observation |
| 15 | 250 | CE | RE | [0..1] |  | 00583 | Producer's ID |
| 16 | 250 | XCN | RE | [0..1] |  | 00584 | Responsible Observer |
| 17 | 250 | CE | C | [0..1] |  | 00936 | Observation Method |
| 19 | 26 | TS | RE | [0..1] |  | 01480 | Date/Time of the Analysis |
| 23 | 567 | XON | C | [0..1] |  | 02283 | Performing Organization Name |

**Table 3.9-1 : OBX Segment**

No extra information from CPOE on top of IHE specification.

## 3.11 Microbiology reporting rules

CPOE supports the IHE format for microbiology reporting, with some specific details to keep in mind

#### 3.11.1 Principle

CPOE follows the rules mentioned in IHE LAB-TD vol2. under 3.11, but we are not as strict regarding use of LOINC or SNOMED-CT.

We interpret the standard needing to use LOINC & SNOMED-CT codes for correct reporting. We apply the following rules

1.) Reporting via OBX of a germ identified must use the IHE mentioned 11475-1^MICROORGANISM IDENTIFIED^LN.

The second component or name ‘MICROORGANISM IDENTIFIED’ can be translated, but we strictly need ‘11475-1’ as first component and ‘LN’ as third component.

The value in OBX-5 does not need to be a SNOMED-CT code and can contain the germ result in any codesystem used by the LIS.

In order to allow a decent label for the test ‘MICROORGANISM IDENTIFIED’, as this is not saying much, we will look at the above OBR4.2 label.

Reasoning: IHE mentions more than 100 codes existing with component name MICROORGANISM IDENTIFIED. Searching through a list of more than 100 codes is not acceptable for an ORT, and searching on the exact word ‘MICROORGANISM IDENTIFIED’ is not compatible with the ongoing work of several organizations to translate LOINC to their language.

2.) Reporting via OBX of a colony count on a specific germ must use the IHE mentioned 564-5^COLONY COUNT^LN.

Same remark for the second component, that can be translated.

Use the OBX-4 as subidentifier to link the colony count to the correct germ identified, as conform IHE.

3.) Antibiotic sensitivity testing on germs needs to be reported under an OBR with OBR-26 identifying the germ, conforming to IHE. However, the identification of the antibiotic in OBX-3 does not need to be a LOINC code, but can be reported in the local code system.

4.) A sensitivity result can be reported in OBX-5 if OBX-2 is of datatype ST. If OBX-2 is of datatype NM, we expect OBX-5 to be filled with the MIC value and OBX-8 containing the susceptibility conform IHE specs in the same chapter.

#### 3.11.2 AN EXAMPLE

MSH|^~\&|OF|S\_CORDIER|ORBIS|ResultImport|20120201172329||ORU^R01^ORU\_R01|8332937201631541894|P|2.5|||||BEL|8859/1|EN||

PID|1||7501052489^^^OF||Simpson^Marge^^^Mr||19641120|F|||^^A F C^^01090^100

PV1||I|||||||||||||||||JC0000407|||||||||||||||||||||||||20120103101100|||||||V

ORC|SC|41468^OF|41468^OF|661201000013^OF|CM||||20120201142045|||005305^PEDIATRIE^^^^^^ward|||||^^^S\_CORDIER^BIOCH\_HEMATO^OF

OBR|1|41468^OF|41468^OF|OF\_MC\_GEN^Culture generale^OF|||20120131172300|||||||||005305^PEDIATRIE^^^^^^ward||||||||S\_CORDIER|F

TQ1|||||||||R

SPM|1|120100001301&OF^120100001301&OF||OF\_MAT\_GEN^Genital^OF||||OF\_CLIT^Clitoris^OF||||0.0^&&&qt&&L|||||20120131172300|20120131173808||Y

OBX|1|CE|11475-1^MICROORGANISM IDENTIFIED^LN^MB\_CULT\_BK\_GEN^Culture generale^OF|1|OF\_CANDAL^Candida albicans^OF|||A|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113900

OBX|2|ST|564-5^COLONY COUNT^LN|1|frequent|||A|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113900

OBX|3|CE|11475-1^MICROORGANISM IDENTIFIED^LN^MB\_CULT\_BK\_GEN^Culture generale^OF|2|OF\_GARDVAG^Gardnerella vaginalis^OF|||A|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113901

OBX|4|ST|564-5^COLONY COUNT^LN|2|frequent|||A|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113901

ORC|SC|41472^OF|41472^OF|661201000013^OF|CM||||20120201142045|||005305^PEDIATRIE^^^^^^ward|||||S\_CORDIER^BIOCH\_HEMATO^OF

OBR|2|41472^OF|41472^OF|ATB^Antibiogramme^OF||||||||||||005305^PEDIATRIE^^^^^^ward||||||||S\_CORDIER|F|11475-1&MICROORGANISM IDENTIFIED&LN&MB\_CULT\_BK\_GEN&Culture generale&OF^1^Candida albicans|||41468&OF^41468&OF

SPM|1|120100001301&OF^120100001301&OF||OF\_MAT\_GEN^Genital^OF||||OF\_CLIT^Clitoris^OF||||0.0^&&&qt&&L|||||20120131172300|20120131173808||Y

OBX|1|ST|OF\_DIFFUS^DIFFUSION^OF|1||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113900

OBX|2|ST|OF\_AMX^AMOXICILLINE^OF|1||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113900

OBX|3|ST|OF\_GEH^GENTAMICINE^OF|1||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113900

ORC|SC|41473^OF|41473^OF|661201000013^OF|CM||||20120201142045|||005305^PEDIATRIE^^^^^^ward|||||S\_CORDIER^BIOCH\_HEMATO^OF

OBR|3|41473^OF|41473^OF|ATB^Antibiogramme^OF||||||||||||005305^PEDIATRIE^^^^^^ward||||||||S\_CORDIER|F|11475-1&MICROORGANISM IDENTIFIED&LN&MB\_CULT\_BK\_GEN&Culture generale&OF^2^Gardnerella vaginalis|||41468&OF^41468&OF

SPM|1|120100001301&OF^120100001301&OF||OF\_MAT\_GEN^Genital^OF||||OF\_CLIT^Clitoris^OF||||0.0^&&&qt&&L|||||20120131172300|20120131173808||Y

OBX|1|ST|OF\_DIFFUS^DIFFUSION^OF|2||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113901

OBX|2|ST|OF\_AMX^AMOXICILLINE^OF|2||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||20120201113901

OBX|3|ST|OF\_GEH^GENTAMICINE^OF|2||||S|||F|||20120131172300|^^^S\_CORDIER^BIOCH\_HEMATO^OF|jd^Do^John|||2012020111390

## 3.13MFI – Master File Identification segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 3 | ID | R | [1..1] | 0180 | 00664 | Record-Level Event Code |
| 2 | 20 | ST | R | [1..1] |  | 00665 | MFN Control ID |
| 4 | 200 | Varies | R | [1..1] |  | 00667 | Primary Key Value – MFE |
| 5 | 3 | ID | R | [1..1] | 0355 | 01319 | Primary Key Value Type |

**Table 3.12-1 MFI – Master File Identification**

**MFI-1 Master File Identifier (CE)**

For Test/Observation Batteries, the value shall contain OMC (Battery Observations Master File M10)

## 3.14MFE – Master File Entry Segment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SEQ** | **LEN** | **DT** | **Usage** | **Card.** | **TBL#** | **ITEM#** | **Element name** |
| 1 | 3 | ID | R | [1..1] | 0180 | 00664 | Record-Level Event Code |
| 2 | 20 | ST | R | [1..1] |  | 00665 | MFN Control ID |
| 4 | 200 | Varies | R | [1..1] |  | 00667 | Primary Key Value – MFE |
| 5 | 3 | ID | R | [1..1] | 0355 | 01319 | Primary Key Value Type |

**Table 3.13-1 MFE – Master File Entry Segment**

**MFE-2 MFN Control ID (ST)** is required since the response level code is ER. It contains an identifier that uniquely identifies the change to the record.

**MFE-4 Primary Key Value – MFE**

It is important to mention that IHE has specified this datatype as CE.

This field is the only property of an LCSD record which can be used to uniquely identify the record.

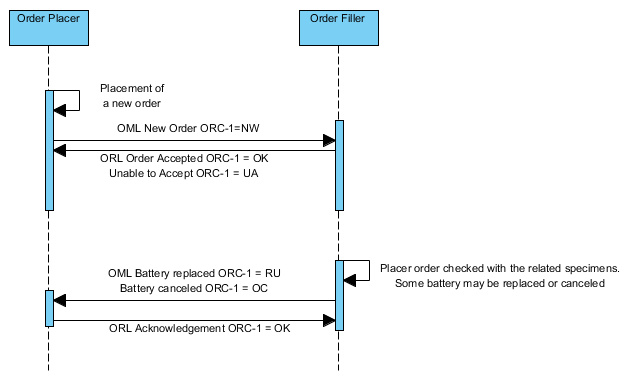
Not to be confused with the value of OM1-2.

MFE-4 can only be the same as OM1-2 if no 2 OM1-2 records in the LCSD file need the same value.

# 4 Transaction LAB-1: Placer Order Management

## 4.1 SUPPORTED USE CASES IN LAB-1

### Use Case 1 : Normal Process of a Placer Order



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

When Order Placer and Order Result Tracker Actors are grouped in one application, which is the case in ORBIS, no status changes on orders, triggered by the Order Filler, are sent back to ORBIS with the LAB-1 transaction.

Status changes on existing orders are always sent back from Order Filler to ORBIS with the LAB-3 transaction (out of scope of this document).

In theory, the OF (Order Filler) can send a LAB-1 message to OP (Order Placer) for replacement or cancellation of a battery, but that would require an extra interface running, and is only relevant in theoretical cases where no LAB-3 is sent yet. By default, this interface will not be set up.

**When ORBIS = LIP (When ORBIS is Label Information Provider)**

An order group with one or more orders is created in ORBIS, but no transaction LAB-1 is sent. It is only once specimen are confirmed after collection, or when labels are printed out in ORBIS, that orders linked to the specimen are sent with LAB-1 and status NW.

There is no current need to support the ORC-1=RU or OC control codes, as the order placer in ORBIS is not interested.

There is no current need to support updates on information related to an existing order with ORC-1=XO, as Order Groups will be validated and specimen taken before the first message is sent to LIS, so all the information necessary is available.

**When LIS = LIP (Labo System = Label Information Provider)**

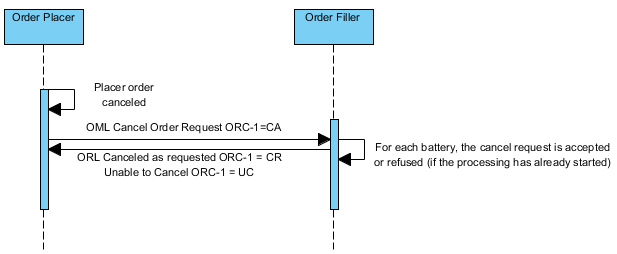
An order group with one or more orders is created in ORBIS, and a transaction LAB-1, OML is sent when the group is signed. (not when only prepared)

We then expect specimen identification to be sent back in the LAB-1, ORL.

There is no current need to support the ORC-1=RU or OC control codes, as the order placer in ORBIS is not interested

There is no current need to support updates on information related to an existing order with ORC-1= XO, as order groups will be canceled and recreated instead by the Order Placer.

### Use Case 2: Cancellation of an Order by the Order Placer



The ORBIS order placer can cancel an existing order in an existing order group and an update will be sent to the order filler with ORC-1=CA. The filler can respond with CR or UC.

The ORBIS order placer can add new orders to an existing order group by following Use Case 1.

### Use Case 3: Cancellation of an Order initiated by the Order Filler

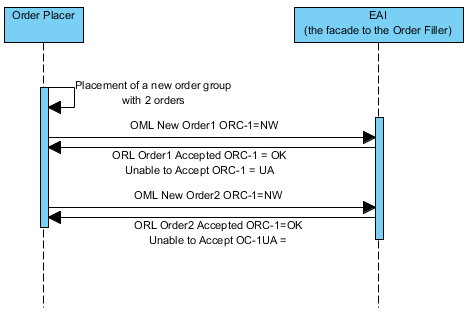
Not supported.

### Use Case 4: CPOE-specific: A multi-LIS DOMAIN environment

With a multi-domain environment in the laboratory workflow, we mean that one test ordered by a physician can be routed to more than one possible destination. The destinations can have different physical lab systems in place, so different interface connections need to be made.

CPOE can rout each order in an order group, based on routing rules, to the correct physical laboratory department.

Considering an order group is created with 2 orders & specimen collected, and both orders are realized in different laboratories, 2 LAB-1 messages will be sent to the filler, each containing in the MSH segment the correct destination.



### USE CASE 5: Status change of an order by the order placer

Support of ORC-1 status SC in case of some specimen updates

We will support ORC-1 with status SC in OML LAB-1 messages when there is only a collection or rejection done for an existing specimen linked to an OBR.

When an ORC-1 is sent with status SC, only the following fields can change

* SPM-17 as specimen date/time of collection
* An OBX can be added to an OBR as a clinical observation filled in by the nurse
* SPM-14 as a specimen specific comment by the nurse
* SPM-20 as availability information. Can be set to N when specimen was not collected. It will not become available anymore to LIS
* OBR-10: collector information

There are 3 cases possible to know if a specimen has been collected:

* The specimen is collected. In the update message, SPM segment is present, SPM-20 is empty and SPM-17 is filled in with specimen collection date/time.
* The specimen is not collected yet, but replanned. In the update message, SPM segment is present, SPM-20 = empty and SPM-17 is empty
* The specimen is not collected, due to rejection. It will not be sent to the labo anymore. In the update message, SPM segment is present, SPM-20 = ‘N’, SPM17 is empty.

The SC status is not used when the physician updates the order.

The status SC is of course never used for the first message of the order to the LIS, even if SPM collection fields are already filled in. The first message always has NW.

### USE CASE: ORDER MODIFICATION by the order placer

As long as no specimen label is printed out for the order group in ORBIS, the clinician, or a colleague with sufficient rights, is allowed to modify the order functionally.

Technically however, this results in a cancellation message of the first order group, and a complete new order group initiated.

Reasoning: the request of orders in one ordergroup leads to specimen calculation for the entire group, and consequently leads to routing to the correct laboratories, possibly based on opening hours of labos. These 2 algorithms lead us to technical difficulties when recalculating after modification. We could end up with the same order and order group ids that need a cancellation message to labo1, and at the same time an update message to labo2.

This situation is not described by the current IHE standard, so we currently prefer to send CA and then a new NW.

## Other points

The LAB-TF interfaces cover the workflow for diagnostic service sections : Blood Gases, Chemistry, Hematology, Immunology, Laboratory, Microbiology, Mycobacteriology, Mycology, Serology, Toxicology, Virology.

It does not theoretically cover Anatomo-Pathology, as there is a specific IHE framework for this

.

## Supported Events

In the tables below, events with a green background are standard IHE; events with a grey background are not supported by CPOE.

### LAB-1

|  |  |  |
| --- | --- | --- |
| **Event** | **Code** | **Event type** |
| Laboratory order message | OML^O21 | OML^O21^OML\_O21 |
| Response message to OML^O21 | ORL^O22 | ORL^O22^ORL\_O22 |
| Laboratory order for multiple orders related to a single specimen. | OML^O33 | OML^O33^OML\_O33 |
| Response message to OML^O33 | ORL^O34 | ORL^O34^ORL\_O34 |
| Laboratory order for multiple orders related to a single container of a specimen. | OML^O35 | OML^O35^OML\_O35 |
| Response message to OML^O35 | ORL^O36 | ORL^O36^ORL\_O36 |

The Order Placer Actor ORBIS can choose the type of message they send to the order filler. All 3 messages can contain the same information, only the grouping is different. Because the order placer is mainly focused on providing order related info, we have chosen OML^O21. The Order Filler will respond with an ORL^O22 response message.

## Supported segments

Segments in the table below with a green background will be supported by Orbis, segments with a grey background will not be supported by Orbis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** | **Commentaires** |
| MSH | Message Header | R | [1..1] |  |
| PID | Patient Identification | R | [1..1] |  |
| PV1 | Patient Visit | RE | [0..1] |  |
| ORC | Common Order (for one battery) | R | [1..\*] |  |
| TQ1 | Timing Quantity | RE | [0..\*] |  |
| OBR | Observation Request | R | [1..\*] |  |
| NTE | Notes and Comments | O | [0..\*] |  |
| OBX | Observation Result | O | [0..\*] |  |
| SPM | Specimen | R | [1..\*] |  |
| SAC | Container | C | [0..\*] | SAC segment is not supported. |
| MSA | Message Acknowledgement | R | [1..\*] |  |
| ERR | Error | C | [0..\*] |  |

## Static message definition for transaction LAB-1 OML^O21

Supported segments in green, non supported segments in grey.

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| [ | ---PATIENT begin | RE | [0..1] |
| PID | Patient Identification | R | [1..1] |
| [PV1] | Patient Visit | RE | [0..1] |
| ] | ---PATIENT end | R | [1..1] |
| { | ---ORDER begin | R | [1..\*] |
| ORC | Common Order (for one battery) | R | [1..1] |
| [TQ1] | Timing Quantity | RE | [0..1] |
|  | ---OBSERVATION REQUEST begin | R | [1..1] |
| OBR | Observation Request | R | [1..1] |
| {[NTE]} | Notes and Comments | O | [0..\*] |
| [{ | ---OBSERVATION begin | O | [0..\*] |
| OBX | Observation Result | R | [1..1] |
| [{NTE]} | Comment of the result | C | [0..\*] |
| }] | ---OBSERVATION end |  |  |
| [{ | ---SPECIMEN begin | O | [0..\*] |
| SPM | Specimen | R | [1..1] |
| [{SAC}] | Container | C | [0..\*] |
| }] | ---SPECIMEN end |  |  |
| [{ | ---PRIOR\_RESULT begin | O | [0..\*] |
|  |  |  |  |
| }] | ---PRIOR\_RESULT end |  |  |
|  | ---OBSERVATION REQUEST end |  |  |
| } | ---ORDER end |  |  |

The triplet (ORC, TQ1, OBR) represents the Order (ie 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. ORBIS will always send an order as part of an order group, never as a standalone order.

The OBSERVATION repeatable segment group carries the observations provided by the orderer or nurse (patient temperature, blood pressure, weight, localization, etc…).

NTE segment under OBX are not supported, as the condition indicates only clinical non structured information that cannot be modeled with OBX (observation results) should be send. We don’t promote or support this.

The PRIOR\_RESULT segments are not supported as no functional use case indicates the necessity to do this.

SAC segment not supported, see explanation earlier. (everything needed is available in the SPM segment).

### MSH Segment

Unlike many other interface transactions, the MSH segment does contain important information for LAB-1: it contains the destinated laboratory department for all the orders in the message. It also contains the name of the LIS application used at the destinated laboratory department. Both are important information in a multi LIS environment.

The table below contains the fields in the MSH segment supported by the Orbis inbound LAB-51 interface.

|  |  |  |
| --- | --- | --- |
| MSH | Element name | Value/Comment |
| MSH-1 | Field Separator | | |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & |
| MSH-3 | Sending Application | ORBIS |
| MSH-4 | Sending Facility | Explanation below  ORBIS |
| MSH-5 | Receiving Application | e.g. : LIS1 |
| MSH-6 | Receiving Facility | UMA exécutrice  Explanation below  e.g. : 014x577 |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS |
| MSH-9 | Message Type | OML^O21^OML\_O21 |
| MSH-10 | Message Control ID | Unique identifier of the message |
| MSH-11 | Processing ID | P |
| MSH-12 | Version ID | 2.5 |
| MSH-17 | County code | 3 character ISO code for the country (FRA) |
| MSH-18 | Character set | ISO-8859-1  character set (Latin 1) |

**MSH-4**

The sending facility will always be constant ‘ORBIS’. The reason why we don’t put the requesting department in the field is because we don’t need it. All requesting departments use the same ORBIS application & database & interface framework BPE, and the feedback will be correctly sent to the ordering physician and ordering department due to the internal organization structure in ORBIS.

**MSH-6**

The receiving facility identifies the physical destinated laboratory department for the message.

We will put the OM1.5-1 subcomponent value in MSH-6. This info is sent to us via the LCSD profile.

So if OM1.5 is 014x577, we will put 014x577 as value.

Remark that only one receiving facility can be put in the whole message.

As a the result of the routing mechanism in the workflow, if more than one receiving facility is involved for the realization of an order group, there will be as many LAB-1 messages created as there are different receiving facilities.

More explanation in the multi-domain environment use case higher up in this specification document.

### PID Segment

For more detailed information on PID segment, I refer to CPOE ADT specifications.

The PID segment in LAB-1 transaction will contain following fields only, as required by IHE:

|  |  |  |
| --- | --- | --- |
| PID | Element name | Comment |
| PID-1 | Set ID –PID |  |
| PID-3 | Patient Identifier List | PID-3.1 = Patient identifier  PID-3.4 = Assigning authority |
| PID-5 | Patient Name |  |
| PID-6 | Mother’s maiden name |  |
| PID-7 | Date/Time of birth | YYYYMMDD |
| PID-8 | Administrative sex |  |

**PID-3**

The subfield PID-3.1 will contain the patient identifier, and the component PID-3.4 (assigning authority) will contain the domain identifier.

Since Orbis has multiple identifiers per patient, multiple identifiers can be sent as multiple occurrences of the field PID-3.

### PV1 Segment

For more detailed information on PV1 segment, I refer to CPOE’s ADT specifications.

The PV1 segment will always be present in LAB-1, because it’s always available in Orbis.

The PV1 segment in LAB-1 transaction, if provided looks like this.

|  |  |  |
| --- | --- | --- |
| PV1 | Element name | Comment |
| PV1-2 | Patient Class | I(npatient) or O(utpatient) |
| PV1-3 | Patient location |  |
| PV1-19 | Visit Number |  |

### ORC Segment – Common order

One ORC Segment is created for every test/battery in an order group. A lot of redundant fields exist in ORC and OBR. IHE suggests and ORBIS supports that redundant fields will be filled in the OBR segment.

|  |  |  |
| --- | --- | --- |
| ORC | Element name | Comment |
| ORC-1 | Order Control | See explanation below |
| ORC-2 | Placer Order Number | Unique sequential id created by ORBIS |
| ORC-3 | Filler Order Number | Will be stored in ORBIS, unique id created by Order Filler in Response message. |
| ORC-4 | Placer Group Number | See explanation below |
| ORC-5 | Order Status | Will be filled by filler in ORL messages. In LAB-1, we support value CA only. Other values supported in LAB-3 |
| ORC-9 | Date/Time of Transaction | YYYYMMDDHHMMSS |
| ORC-10 | Entered By | See explanation below. |
| ORC-13 | Enterer’s Location | See explanation below |

**ORC-1**

A indicates that CPOE actively sends out this status with OML^O21

P indicates that CPOE passively supports this status in ORL^O22. The information is passively shown in the feedback tab of a lab order form.

N indicates the status is not supported in LAB-1. This does not mean the status is not supported in LAB-3!

|  |  |  |
| --- | --- | --- |
| Value | Description of use | Supported |
| NW | “New Order”. | A |
| OK | “Notification or request accepted”. | P |
| UA | “Unable to accept order/service” | P |
| SC | “Status changed” | A |
| CA | “Cancel order/ service request”. | A |
| CR | “Canceled as requested”. | P |
| UC | “Unable to cancel”. | P |
| OC | “Order service canceled”. | N |
| SN | “Send order/service number” | N |
| NA | “Number assigned” | N |
| RP | “Order/service replace request”. | N |
| RQ | “Replaced as requested”. | N |
| UM | “Unable to replace”. | N |
| RU | “Replaced unsolicited”. | N |
| XO | “Change order/service request”. | N |
| XR | “Changed as requested”. | N |
| UX | “Unable to change” | N |
| PR | “Previous results with new order/service” | N |

Subset of HL7 table 0119 – Order Control Codes supported by CPOE.

**ORC-4**

The placer group number is, after the specimen ids, probably the most important number for the laboratory request. It is a number that all transactions in the workflow need to communicate to each other. It is the number that will be visible in ORBIS in the order form, and will be reflected in a column for result reporting in the result viewer.

ORBIS creates this number for all order groups created. If an order group is created by the laboratory system, they will create the order group number for their request. There cannot be any doubles due to the ORC4-3 subcomponent.

**ORC-10 Entered by**

XCN datatype. The person as employee object in ORBIS who created the order. The employee can in theory be different for different orders of one order group.

To synchronize the ORBIS employee catalogue with 3rd party catalogues, we refer to CPOE’s specifications on synchronizing Master Data.

The order filler systems must be synchronized with these employees if we send this information in LAB-1 transaction. Messages with unknown employees in our system will be rejected

3 subcomponents of the datatype are sent to uniquely identify the employee.

ORC-10.1 ID Number

ORC-10.2 Family Name

ORC-10.3 Given Name

**ORC-13 Enterer’s Location**

1 subcomponent of this PL datatype will be filled with the code of the ward the requestor is logged in with at the time of order group validation

ORC-13.1 point of care IS

### TQ1 Segment – Timing Quantity

|  |  |  |
| --- | --- | --- |
| TQ1 | Element name | Comment |
| TQ1-9 | Priority | A and R values supported (ASAP and Routine) |

Each order in the order group can have a different priority, although it is not such a good practice to have this complexity, due to split specimen collection and result reporting complexity.

### OBR Segment – Observation Request

|  |  |  |
| --- | --- | --- |
| OBR | Element name | Comment |
| OBR-2 | Placer Order Number | Equals ORC-2 |
| OBR-3 | Filler Order Number | Equals ORC-3 |
| OBR-4 | Universal Service Identifier | Equals OM1.2 from the LCSD profile |
| OBR-10 | Collector Identifier | See explanation below |
| OBR-16 | Ordering Provider | See explanation below |
| OBR-28 | Result Copies to | See explanation below |
| OBR-31 | Reason For Study | See explanation below |

**OBR-10**

Defines the employee who collected the specimen. Same explanation as for ORC-10 for detailed info on the fields format.

**OBR-16**

The responsible employee for the order. Same explanation as for ORC-10 for detailed info on the fields format. In most cases, the employee will be a physician, but this is not exhaustive, for example, this employee can be a midwife.

**OBR-28**

The ordering physician can indicate that a copy of the results should be sent to the person in this field. It is only necessary to send a copy to a home physician, someone not working in ORBIS. Users working with ORBIS get the results through the application anyway.

It is a structured code, not a free text. Same explanation as for ORC-10 for detailed info on the fields format.

**OBR-31**

The reason for study encoded a CE, where the text component contains the information.

### NTE Segment – Notes and Comments

Accompanying free comments linked to orders.

All NTE segments will be put directly after the OBR segment in the HL7 message, following the HL7 recommendations.

|  |  |  |
| --- | --- | --- |
| NTE | Element name | Comment |
| NTE-1 | Set ID |  |
| NTE-2 | Source of comment | P |
| NTE-3 | Comment | Free text |
| NTE-4 | Comment type | See explanation |

**NTE-3 - Comment**

Contains the actual comment.

**NTE-4 – Comment type**

This field indicates the comment type.

Remark: there are 3 types of comment.

* + Comment on the prescription (NTE)
  + Comment on a test (NTE)
  + Comment on a specimen (SPM)

Comments on prescription and on tests are provided in the NTE segment, the comment on the specimen is provided in the SPM segment.

|  |  |
| --- | --- |
| Value NTE-4 | Description |
| OD | Indicates that the comment sent in NTE-3 is a comment on the prescription (order group) |
| QC | Indicates that the comment sent in NTE-3 is a comment on the test (order) |

### OBX Segment – Observation Result

The segment is only used in LAB-1 transaction to report results of clinical observations needed in order to interpret results of laboratory tests.

|  |  |  |
| --- | --- | --- |
| OBX | Element name | Comment |
| OBX-1 | Set ID – OBX | Unique Sequence ID |
| OBX-2 | Value Type | CE,DT,NM,ST,TM,TS,TX |
| OBX-3 | Observation Identifier | Equals OM1.2 from the LCSD profile |
| OBX-5 | Observation Value | Contains the result of the clinical observation entered at ordering or sample collection time |
| OBX-11 | Observation Result Status | F |
| OBX-14 | Date/Time of the Observation | YYYYMMDDHHMMSS |
| OBX-16 | Responsible Observer | See explanation below |

**OBX-11**

We provide functionality that only allows clinically validated results to be used in certain contexts. This functionality uses the IHE Observation Result Status ‘F’ which means clinically validated and cannot modified to work with another status.

**OBX-16**

The responsible employee entering the clinical observation’s value. Will mostly match the ordering physician OBR-16 or the nurse that collected the specimen OBR-10.

Same format and source as in ORC-10

### SPM Segment – Specimen

Specimens are collected before LAB-1 is sent to the order filler systems.

Therefore, SPM segments will be fully described in the LAB-1 transaction.

Feedback on Specimen status by the Order Filler departments is sent in LAB-3, not LAB-1.

|  |  |  |
| --- | --- | --- |
| SPM | Element name | Comment |
| SPM-1 | Set ID – SPM | Unique sequence identifier |
| SPM-2 | Specimen ID | See explanation below  Fe. 10 0 000 000 000^ORBIS |
| SPM-4 | Specimen Type | CWE SPM-4.1 Identifier, SPM-4.2 Text, SPM-4.3 coding system. Will match OM4-6 from the LCSD profile.  f.e. 101^Sang^LIS |
| SPM-5 | Specimen Type Modifier | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen type modifier. How to parametrize the link between the clinical observation and this field is mentioned in Use Case 3.2 of the LCSD specification |
| SPM-7 | Specimen Collection Method | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen collection method. How to parametrize the link between the clinical observation and this field is mentioned in Use case 3.2 of the LCSD specification |
| SPM-8 | Specimen Source Site | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen source site. How to parametrize the link between the clinical observation and this field is mentioned in Use case 3.2 of the LCSD specification |
| SPM-9 | Specimen Source Site Modifier | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen source site modifier. How to parametrize the link between the clinical observation and this field is mentioned in Use case 3.2 of the LCSD specification |
| SPM-10 | Specimen Collection Site | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen collection site. How to parametrize the link between the clinical observation and this field is mentioned in Use case 3.2 of the LCSD specification |
| SPM-11 | Specimen Role | P (As we only support specimens on patients, see previous) |
| SPM-14 | Specimen description | ORBIS will fill this field for certain tests with the value of a clinical observation that is parametrized to indicate the specimen collection site. How to parametrize the link between the clinical observation and this field is mentioned in Use case 3.2 of the LCSD specification. This will be sent in LAB-1 in case LIP=ORBIS  This field can be changed as specimen comment, entered by a nurse at specimen collection date/time. |
| SPM-17 | Specimen Collection Date/Time | YYYYMMDDHHMMSS |
| SPM-20 | Specimen availability | See below |
| SPM-26 | Number of Specimen Containers | Numeric value, in most cases: 1. See previous for more explanation |

**SPM-2**

EIP datatype. ORBIS only stores the first EI part, so SPM-2.1 Entity Identifier and SPM-2.2 Namespace ID are used.

The specimen IDs for the primary labels are created by ORBIS.

The specimen numbering has some constraints & requirements that are interesting to know for the order filler.

Providing 9 billion unique IDs per year is possible.

Providing a different number range for internal/external hospital specimen treatment is possible.

Providing for a sub-range that cannot be touched by ORBIS is sometimes asked, due to

* Number length is limited to 12 due to limitations of several analyzers.
* SPM-2.2 cannot be used in the bar code due to this limitation.

**SPM-20 Specimen availability**

This field will be filled with value N in case a test has multiple specimens to be taken, and when the second or further specimen has not been taken. This field is used to indicate to the order filler that the specimen is not taken, and hence will not arrive in the Lab.

See general SPM section for more information.

Remark here that the use of this field in Lab-1 is different than the use of this field in Lab-3. In Lab-3, SPM-20 is used to indicate a non-conformity, initiated by the order filler. In Lab-1, it is Orbis that indicates to the order filler that an expected specimen will not arrive in the Lab.

## Static message definition for ORL^O22

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

## General

Unlike ADT interfaces, the laboratory related interfaces fully comply with IHE and have to acknowledge messages via an application type message. This means they will send back the acknowledgement message ONLY AFTER parsing the content of the respective OML^O21 messages to give possibility to report content wise errors.

Only the Order Filler’s Receiving Application can send us such an application response,

### MSH Segment

|  |  |  |
| --- | --- | --- |
| MSH | Element name | Value/Comment |
| MSH-1 | Field Separator | | |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & |
| MSH-3 | Sending Application | e.g. : LIS1 |
| MSH-4 | Sending Facility | e.g. : SLS |
| MSH-5 | Receiving Application | e.g. : ORBIS |
| MSH-6 | Receiving Facility | e.g. : ORBIS |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS |
| MSH-9 | Message Type | ORL^O22^ORL\_O22 |
| MSH-10 | Message Control ID | Unique identifier of the message |
| MSH-11 | Processing ID | P |
| MSH-12 | Version ID | 2.5 |
| MSH-17 | County code | 3 character ISO code for the country (FRA) |
| MSH-18 | Character set | ISO-8859-1  character set (Latin 1) |

### MSA Segment – Message Acknowledgement

|  |  |  |
| --- | --- | --- |
| MSA | Element name | Comment/Value |
| MSA-1 | Acknowledgement code | AA (accept), AE (error) or AR (reject) |
| MSA-2 | Message control Id | Equals MSH-10 of incoming message |

### ERR Segment – Error Segment

In case MSA-1 is AE or AR, the error segment is sent in the ORL message

|  |  |  |
| --- | --- | --- |
| ERR | Element name | Comment |
| ERR-2 | Error Location | If AR, not filled. If AE, contains HL7 field where error occurred. |
| ERR-3 | HL7 Error Code | Contains a possible  HL7 Table 0357 - Message error condition codes |

### ORC Segment – Common order

Only fields not discussed in the OML^O21 ORC segment and relevant extra information in the ORL^O22 are mentioned here.

|  |  |  |
| --- | --- | --- |
| ORC | Element name | Comment |
| ORC-4 | Placer Group Number | Must be put in the ORL message by the order filler |
| ORC-5 | Order Status | Will be filled by filler in ORL messages. In LAB-1, we support value CA only. Other values supported in LAB-3 |

### OBR Segment – Observation Request

Only fields not discussed in the OML^O21 OBR segment and relevant extra information in the ORL^O22 are mentioned here.

|  |  |  |
| --- | --- | --- |
| OBR | Element name | Comment |
| OBR-3 | Filler Order Number | New information in this message |
| OBR-25 | Order Result Status | See explanation below |

**OBR-25**

Info sent by the order filler and shown in the feedback tab of the order form in ORBIS.

Values sent in ORL^O22 can be:

|  |  |
| --- | --- |
| Value | Description |
| O | Order received, specimen not yet received |

All the other values will come in with LAB-3 transaction.

### SPM Segment – Specimen

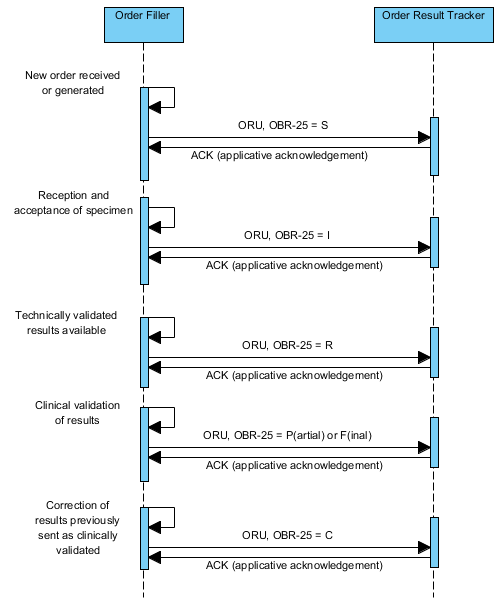
Only fields not discussed in the OML^O21 SPM segment and relevant extra information in the ORL^O22 are mentioned here.

|  |  |  |
| --- | --- | --- |
| SPM | Element name | Comment |
|  |  |  |
| SPM-7 | Specimen Collection Method | SPM-7 is ignored by ORBIS in this message, as each ORC/OBR/SPM-7 combination is send in another ORC/OBR iteration. Hence, the ORC/OBR identifiers will uniquely identify the SPM. |
| SPM-8 | Specimen Source Site | idem |
| SPM-9 | Specimen Source Site Modifier | idem |
| SPM-10 | Specimen Collection Site | idem |
| SPM-14 | Specimen Description | idem |
| SPM-18 | Specimen Received Date/Time | Just for clarification: Sent back via LAB-3, not via the ORL message |
| SPM-20 | Specimen availability | Idem |
| SPM-21 | Specimen Reject Reason | Idem |
| SPM-27 | Container Type | Identical with OM4-3 e.g SECG\_SER^Tube sec + gel 5ml JAUNE/ROUGE |

# 6. Transaction LAB-3: Order Results Management

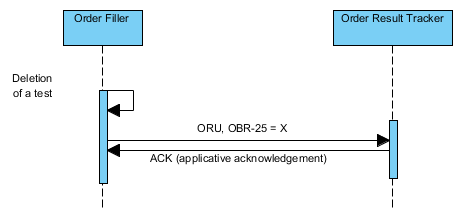
## Supported Use Cases in LAB-3

### Use Case 1 : Normal Process for management of Results of a Filler Order



In ORBIS, the statuses on order / test level (OBR-25) are shown in the feedback tab linked to the order group. The statuses on result level (OBX-) are shown in the result viewer.

### Use Case 2 : Deletion of a Battery/Test in a Filler Order



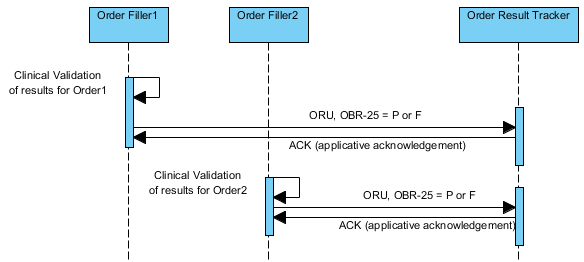
This is the case when the laboratory decides not to realize an ordered test.

### Use Case 3: CPOE-specific: A multi-domain environment of LABO’s

With a multi-domain environment in the laboratory workflow, we mean that one test ordered by a physician can be routed to more than one possible destination. The destinations can have different physical lab systems in place, so different interface connections need to be made.

ORBIS will rout each order in an order group, based on routing rules (algorithm out of scope of interface specification document), to the correct physical laboratory department.

Considering an order group is created with 2 orders & specimen collected, and both orders are realized in different laboratories, independent LAB-3 messages on results can be sent to the order results tracker, each containing in the MSH segment the correct origin. The identifier that binds both independent orders together is the order group identifier.



Simplification is made in the schema, only containing clinical validation status, but all the other statuses of the normal process in use case 1 and cancellation in use case 2 apply here as well.

## Other points

The LAB-TF interfaces cover the workflow for diagnostic service sections : Blood Gases, Chemistry, Hematology, Immunology, Laboratory, Microbiology, Mycobacteriology, Mycology, Serology, Toxicology, Virology.

It does not theoretically cover Anatomo-Pathology.

## Supported Message Profiles

In the tables below, events with a green background are supported; events with a grey background are not supported.

### LAB-3

|  |  |  |
| --- | --- | --- |
| **Event** | **Code** | **Event type** |
| Specimen centered result reporting | OUL^R22 | OUL^R22^OUL\_R22 |
| Order centered result reporting | ORU^R01 | ORU^R01^ORU\_R01 |

The Order Filler Actor can choose the type of message they send to the order result tracker. Both messages can contain the same information, only the grouping is different. Because the order filler system from our pilot site has decided to support ORU^R01, currently only this format is supported for non-pilots. If the Order Filler does not want to support this format for a specific reason, an extra meeting with all parties is necessary.

### Supported segments

Segments in the table below with a green background will be supported by Orbis; segments with a grey background will not be supported by Orbis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** | **Comments** |
| MSH | Message Header | R | [1..1] |  |
| PID | Patient Identification | R | [1..1] |  |
| PV1 | Patient Visit | RE | [0..1] |  |
| ORC | Common Order (for one battery) | R | [1..\*] |  |
| OBR | Observation Request | R | [1..\*] |  |
| TQ1 | Timing Quantity | RE | [0..\*] |  |
| OBX | Observation Result | R | [1..\*] |  |
| NTE | Notes and Comments | C | [0..\*] |  |
| SPM | Specimen | R | [1..\*] |  |
| MSA | Message Acknowledgement | R | [1..\*] |  |
| ERR | Error | C | [0..\*] |  |

## Static message definition for transaction LAB-3 ORU^R01

Supported segments in green; non-supported segments in grey.

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| [ | ---PATIENT begin | RE | [0..1] |
| PID | Patient Identification | R | [1..1] |
| [PV1] | Patient Visit | RE | [0..1] |
| ] | ---PATIENT end | R | [1..1] |
| { | ---ORDER\_OBSERVATION begin | R | [1..\*] |
| ORC | Common Order (for one battery) | R | [1..1] |
| OBR | Observation Request | R | [1..1] |
| [{TQ1}] | Timing Quantity | RE | [0..1] |
| [{ | ---OBSERVATION begin | O | [0..\*] |
| OBX | Observation related to OBR | R | [1..1] |
| {[NTE]} | Comments of the result | C | [0..\*] |
| }] | ---OBSERVATION end |  |  |
| [{ | ---SPECIMEN begin | O | [0..\*] |
| SPM | Specimen | R | [1..1] |
| [{OBX}] | Observation related to specimen | O | [0..\*] |
| }] | ---SPECIMEN end |  |  |
| } | ---ORDER\_OBSERVATION end |  |  |

For multi-specimen batteries, each specimen of the battery is described in an SPM segment. The tests performed on that specimen will have their observations reported in OBX segments following the SPM, in order to make the distinction.

**CPOE specific:**

IHE specs define that all the OBX segments for an OBR should be send in every message. When an OBX segment is missing the result will be marked as invalid and will not be visible in our application.

The reason for this is that for the moment the majority of LIS systems we work with are unable to send correct cancellation messages of some results, especially microbiology germs.

So this feature on top is not incompatible with the IHE standard, and supports the functional gap of several LIS systems.

### MSH Segment

Unlike many other interface transactions, the MSH segment does contain important information for LAB-3: it contains the source laboratory department for all the orders in the message. It also contains the name of the LIS application used at the laboratory department. Both are important information for the system to receive info from the correct Laboratory.

The table below contains the fields in the MSH segment supported by the Orbis inbound LAB-3 interface.

|  |  |  |
| --- | --- | --- |
| MSH | Element name | Value/Comment |
| MSH-1 | Field Seperator | | |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & |
| MSH-3 | Sending Application | Mirrors MSH-5 from LAB-1. |
| MSH-4 | Sending Facility | Mirrors MSH-6 from LAB-1 |
| MSH-5 | Receiving Application | Mirrors MSH-3 from LAB-1 |
| MSH-6 | Receiving Facility | Mirrors MSH-4 from LAB |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS |
| MSH-9 | Message Type | ORU^R01^ORU\_R01 |
| MSH-10 | Message Control ID | Unique identifier of the message |
| MSH-11 | Processing ID | P |
| MSH-12 | Version ID | 2.5 |
| MSH-17 | County code | 3 character ISO code for the country (FRA) |
| MSH-18 | Character set | ISO-8859-1  character set (Latin 1) |

### PID Segment

For more detailed information on PID segment, you can also refer to CPOE’s ADT specifications.

The PID segment in LAB-1 transaction will contain following fields only, as required by IHE:

|  |  |  |
| --- | --- | --- |
| PID | Element name | Comment |
| PID-1 | Set ID –PID |  |
| PID-3 | Patient Identifier List | NAP equals IPP  PID-3.1 = Patient identifier  PID-3.4 = Assigning authority |
| PID-5 | Patient Name |  |
| PID-6 | Mother’s maiden name |  |
| PID-7 | Date/Time of birth | YYYYMMDD |
| PID-8 | Administrative sex |  |

**PID-3**

The subfield PID-3.1 should contain the patient identifier, and the component PID-3.4 (assigning authority) should contain the domain identifier.

Since Orbis has multiple identifiers per patient, the search for the right patient is dependent on the value sent in PID-3.4.

### PV1 Segment

For more detailed information on PV1 segment, you can also refer to CPOE’s ADT specifications.

The PV1 segment in LAB-3 transaction, if provided looks like this.

|  |  |  |
| --- | --- | --- |
| PV1 | Element name | <Comment |
| PV1-2 | Patient Class | I(npatient) or O(utpatient) |
| PV1-19 | Visit Number |  |

**CPOE specific:**

Although the PV1 segment is optional in IHE LAB-3, the CPOE ORBIS application requires

PV1-19, to link the results to the correct patient’s case & file.

In most cases, ORBIS knows to which case LAB-3 results are linked, due to ORBIS being the ADT master, but we strongly recommend the Order Filler to use the PV1 segment to improve the performance of the interfaces.

When a case is not provided to ORBIS in LAB-3 by the order filler, and ORBIS cannot find a related case (by making use of the same outpatient dossier search mechanism as for other inbound interfaces), i.e. only really possible in degraded modes of ORBIS ADT master or Order Filler, ORBIS will reject the message.

### ORC Segment – Common order

One ORC Segment is created for every test/battery in an order group. A lot of redundant fields exist in ORC and OBR. IHE suggests and ORBIS supports that redundant fields will be filled in the OBR segment.

|  |  |  |
| --- | --- | --- |
| ORC | Element name | Comment |
| ORC-1 | Order Control | See explanation below |
| ORC-2 | Placer Order Number | Reflects ORC-2 from LAB-1 if order created with ORBIS application. If created by another order placer actor, this number will contain a third subcomponent different than ORBIS. |
| ORC-3 | Filler Order Number |  |
| ORC-4 | Placer Group Number | Reflects ORC-4 from LAB-1 if order group created with ORBIS application. If not created by ORBIS application, ORC-4.3 is valued with a different assigning authority than “ORBIS”. |
| ORC-5 | Order Status | See explanation below |
| ORC-8 | Parent | Not used, see explanation below |
| ORC-9 | Date/Time of Transaction | YYYYMMDDHHMMSS |
| ORC-10 | Entered By | Reflects ORC-10 from LAB-1 |
| ORC-13 | Enterer’s Location | See explanation below. |
| ORC-17 | Entering Organization | See explanation below. |

**ORC-1**

P indicates that CPOE passively supports (i.e. does not trigger itself) this status in LAB-3. The information is passively shown in the feedback tab of a lab order form or in the results viewer

N indicates the status is not supported in LAB-3. But they might be used in LAB-1, see specification document LAB-1.

|  |  |  |
| --- | --- | --- |
| Value | Description of use | Supported |
| NW | “New Order”. | N |
| OK | “Notification or request accepted”. | N |
| UA | “Unable to accept order/service” | N |
| SC | “Status changed” | P |
| CA | “Cancel order/ service request”. | N |
| CR | “Canceled as requested”. | N |
| UC | “Unable to cancel”. | N |
| OC | “Order service canceled”. | P |
| SN | “Send order/service number” | N |
| NA | “Number assigned” | N |
| RP | “Order/service replace request”. | N |
| RQ | “Replaced as requested”. | N |
| UM | “Unable to replace”. | N |
| RU | “Replaced unsolicited”. | P |
| XO | “Change order/service request”. | N |
| XR | “Changed as requested”. | N |
| UX | “Unable to change” | N |
| PR | “Previous results with new order/service” | N |

Subset of HL7 table 0119 – Order Control Codes supported by CPOE

**ORC-5 Order Status**

All values passively supported by ORBIS in the feedback form of an order group.

|  |  |  |
| --- | --- | --- |
| **Value** | **Description of use** | **Supported** |
| A | Some, but not all, results available | P |
| CA | Order was canceled | P |
| CM | Order is completed | P |
| IP | In process, unspecified | P |
| SC | In process, scheduled | P |

**ORC-8 Parent**

Not necessary, not even for microbiology. The OBX results need to be linked, but on order level, no link needed. Reflex tests come as OBX test codes & values linked to the orderable test at the level of cultures.

**ORC-13 Enterer’s Location**

See the IHE specification for standard description.

This information is useful to ORBIS as Order Result Tracker because if the ward is filled in, ORT can better trace in which worklist of the physician the result needs to be added. It is however not as important as ORC-17.

**ORC-17 Entering Organization**

See the IHE specification for standard description.

This information is required when available for ORBIS as Order Result Tracker in LAB-3 to know in which medical department’s worklist the results need to be stored.

If ORBIS is not Order Placer, the external Order Placer System, often the laboratory system, has to send this information.

Pre requisite is that organizational department structures are synchronized between the systems.

If ORBIS does not receive the ORC-17, it will use OBR-16, a mandatory field, to know which physician is responsible, and deduct all known departments linked to that physician. It will then store the result in all known department worklists for that physician.

### OBR Segment – Observation Request

|  |  |  |
| --- | --- | --- |
| OBR | Element name | Comment |
| OBR-2 | Placer Order Number | Equals ORC-2 |
| OBR-3 | Filler Order Number | Equals ORC-3 |
| OBR-4 | Universal Service Identifier | Equals OM1.2 from the LCSD profile |
| OBR-7 | Observation Date/Time | The physiologically relevant time. Must match SPM-17.1 in case of a single specimen, otherwise null value |
| OBR-10 | Collector Identifier | Reflects the OBR-10 value from LAB-1. In degraded modes where specimens are collected, ORBIS expects an employee known to the system. |
| OBR-11 | Specimen Action Code | Not used |
| OBR-16 | Ordering Provider | Reflects the OBR-16 value from LAB-1. In degraded modes, ORBIS expects an employee known to the system. |
| OBR-20 | Filler Field 1 | Not used in IHE |
| OBR-24 | Diagnostic Serv Sect ID | Equals OM1.5 from the referential and sending facility in MSH of LAB-3 |
| OBR-25 | Order Result Status | See values use case1 and use case2. Shown in feedback form order group. |
| OBR-26 | Parent Result | See IHE specs on microbiology reporting rules. OBR-26 is crucial in IHE conform structured microbiology reporting. |
| OBR-28 | Result Copies to | Not used in LAB-3 |
| OBR-29 | Parent | Not used |
| OBR-31 | Principal Result Interpreter | Only the Name part OBR-31.1 is supported as a CNN datatype |

.

### TQ1 Segment – Timing Quantity

|  |  |  |
| --- | --- | --- |
| TQ1 | Element name | Comment |
| TQ1-9 | Priority | A and R values supported (ASAP and Routine) |

Timing/Quantity segment is used in LAB-3 in ORBIS for determining the priority.

For orders created in ORBIS, there is no need to reflect this info in LAB-3, as it is already available in the system, but the order filler may decide to send it anyway.

For orders created outside of ORBIS, and results coming in, the priority is available from TQ1-9.

### OBX Segment – Observation Result

|  |  |  |
| --- | --- | --- |
| OBX | Element name | Comment |
| OBX-1 | Set ID – OBX | Unique Sequence ID |
| OBX-2 | Value Type | All values supported. |
| OBX-3 | Observation Identifier | Equals OM1.2 from the LCSD profile. All 3 subfields OBX-3.1, 3.2 and 3.3 are mandatory in LAB-3 |
| OBX-4 | Observation Sub-ID | Mandatory whenever more than one result for the same OBR is available : this is the case for dynamic results, where several specimen were collected on different times, or for microbiology to report several germs and several susceptibilities f.e. |
| OBX-5 | Observation Value | Value of the result |
| OBX-6 | Units | All 3 subfields OBX-6.1, 6.2 and 6.3 are mandatory in LAB-3 or you can send only the text (OBX-6.2) |
| OBX-7 | References Range |  |
| OBX-8 | Abnormal Flags | Official values of HL7 table 0078 supported : L, H, LL, HH, N, A, AA, null, S, R, I, MS, VS |
| OBX-11 | Observation Result Status | F |
| OBX-13 | User Defined Access Checks | Official values of IHE LAB-3 are supported: O,I,D,R,P,F,C,X |
| OBX-14 | Date/Time of the Observation | YYYYMMDDHHMMSS. Physiologically relevant date/time, in most cases specimen collection date/time |
| OBX-15 | Producer's ID | Not used in ORBIS. |
| OBX-16 | Responsible Observer | The responsible employee for the observation’s value. Most likely a clinical biologist. Employee synchronization necessary. If the employee is not known to ORBIS, we will accept the message anyway as a patient safety risk mitigation. Based on an ISYS setting, we will then either show or not show the information on the cumulative viewer / report printout screen |
| OBX-17 | Observation Method | Observation method in OM1.2 should be explicit enough to identify observation method, and this field is redundant. Not used in ORBIS |
| OBX-19 | Date/Time of the Analysis | YYYYMMDDHHMMSS. Effective date/time test was performed on the analyzer |
| OBX-23 | Performing Organization Name | Performing lab that produced the test result described in this OBX segment. The field shall be filled when the test result carried by the OBX is produced by an outside lab (subcontracting a part of the order). The field shall be populated with the name of the subcontracting lab. |
|  |  |  |

### NTE Segment – Notes and Comments

Accompanying free comments linked to results.

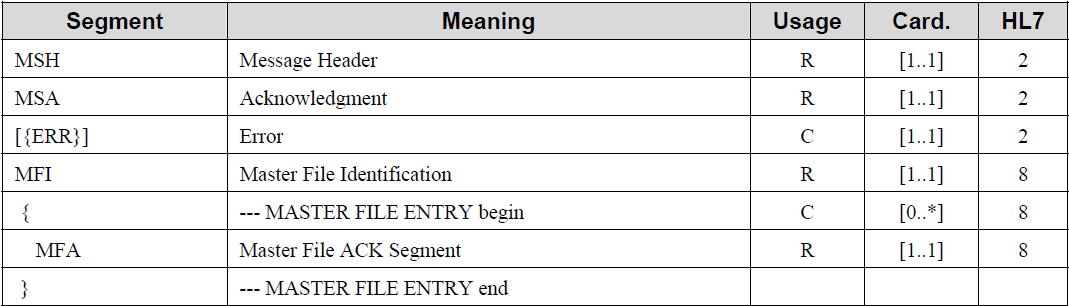
|  |  |  |
| --- | --- | --- |
| NTE | Element name | Comment |
| NTE-1 | Set ID |  |
| NTE-2 | Source of comment | P |
| NTE-3 | Comment | Free text |
| NTE-4 | Comment type | P |

### SPM Segment – Specimen

Feedback on Specimen statuses and activity is sent in LAB-3, and the information is retrieved mainly from the OBR and SPM segments.

|  |  |  |
| --- | --- | --- |
| SPM | Element name | Comment |
| SPM-1 | Set ID – SPM | Unique sequence identifier |
| SPM-2 | Specimen ID | Fe. 09 0 000 000 000&ORBIS. In degraded modes, where specimen are identified and collected by the filler system, the Entity identifier & Namespace combination makes the specimen id always unique, as long as namespaces are unique for all systems in the hospital (group). |
| SPM-4 | Specimen Type | Reflects SPM-4 from LAB-1 |
| SPM-5 | Specimen Type Modifier | Reflects SPM-5 from LAB-1 |
| SPM-7 | Specimen Collection Method | Reflects SPM-7 from LAB-1 |
| SPM-8 | Specimen Source Site | Reflects SPM-8 from LAB-1 |
| SPM-9 | Specimen Source Site Modifier | Reflects SPM-9 from LAB-1 |
| SPM-10 | Specimen Collection Site | Reflects SPM-10 from LAB-1 |
| SPM-11 | Specimen Role | P |
| SPM-14 | Specimen Description | Reflects SPM-14 from LAB-1 |
| SPM-16 | Specimen Risk Code | Not used in LAB-3 |
| SPM-17 | Specimen Collection Date/Time | YYYYMMDDHHMMSS |
| SPM-18 | Specimen Received Date/Time | YYYYMMDDHHMMSS |
| SPM-20 | Specimen Availability | Y/N. Together with OBR-24, this field traces availability of specimen in OF |
| SPM-21 | Specimen Reject Reason | CWE datatype. Together with OBR-24, this field traces specimen reject reasons for OF. |

## Acknowledge messages



Unlike ADT interfaces, the laboratory related interfaces fully comply with IHE and have to acknowledge messages via an application type message. This means they will send back the acknowledgement message ONLY AFTER parsing the content of the respective LAB-3 message to give possibility to report content wise errors.

### MSH Segment

|  |  |  |
| --- | --- | --- |
| MSH | Element name | Value/Comment |
| MSH-1 | Field Separator | | |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & |
| MSH-3 | Sending Application | e.g. : ORBIS |
| MSH-4 | Sending Facility | e.g. : ORBIS |
| MSH-5 | Receiving Application | e.g. : MSH-3 from LAB-3 |
| MSH-6 | Receiving Facility | e.g. : MSH-4 from LAB-3 |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS |
| MSH-9 | Message Type | ORU^R01^ORU\_R01 |
| MSH-10 | Message Control ID | Unique identifier of the message |
| MSH-11 | Processing ID | P |
| MSH-12 | Version ID | 2.5 |
| MSH-17 | County code | 3 character ISO code for the country (FRA) |
| MSH-18 | Character set | ISO-8859-1  character set (Latin 1) |

### MSA Segment – Message Acknowledgement

|  |  |  |
| --- | --- | --- |
| MSA | Element name | Comment/Value |
| MSA-1 | Acknowledgement code | AA (accept), AE (error) or AR (reject) |
| MSA-2 | Message control Id | Equals MSH-10 of incoming message |

### ERR Segment – Error Segment

In case MSA-1 is AE or AR , the error segment is sent in the ACK message

|  |  |  |
| --- | --- | --- |
| ERR | Element name | Comment |
| ERR-2 | Error Location | If AR, not filled. If AE, contains HL7 field where error occurred. |
| ERR-3 | HL7 Error Code | Contains a possible  HL7 Table 0357 - Message error condition codes |

## Special Use cases – Degraded Modes

Some special use cases are described to clarify how the ORBIS interfaces handle some degraded modes of workflow or non-conform IHE handling of data. Degraded modes (mode degrade) are situations, where one of the acting parties/applications is down @runtime.

### Use case 1: Degraded mode : ORBIS/BPE is down.

When ORBIS is down, no order groups & results can be available anymore in ORBIS. Paper orders can be used then, and the order group is created directly in the LIS system, as is the case today in a setting where no electronic order module is in production. It will be possible to send the results to ORBIS when ORBIS is back online independently from the existence of an order group.

For identification of order group, order and specimen ids, the system where the ids have been created will associate their namespace id. In those cases, note that the order placer system may no longer be ORBIS; hence the ids are sent in the order placer appropriate fields.

When BPE is down, and if ORBIS or LIS has sent corresponding messages, the HL7 files will be logged in ERROR mode. Once the BPE system is back online, it will treat the error log accordingly.

In this scenario, the user in ORBIS will temporarily not see any progress of results in the application.

### Use case 2: Degraded MODE: LIS is down.

In these scenario’s, ORBIS does not receive any LAB-3 messages and progress on result reporting may be halted. It is up to the LIS system to send the progress after they are back online.

### Use case 3: When the IPP (Patient identification) is unknown to ORBIS

ORBIS will reject messages with unknown Patient identifier. ORBIS expects the patient to be synchronized between LIS and ORBIS from the ADT master system as pre-requisite of LAB-3.

The LIS system knows if a patient is synchronized with the ADT system, and should not send LAB-3 messages for non-synchronized patients.

### Use case 5 : Microbiology Result Reporting

See chapter 3.11 in this manual.

### Use case 6 : Graphical result reporting

Results in graphical form (jpg, tiff, png, pdf)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field** | **DT** | | **Element name** | **Value** | **comment** | |
| OBX-2 | ID | | Value Type | RP | Reference Pointer | |
| OBX-3 |  | | Observation Identifier | OM1.2 code from LCSD profile | If a graphical result is sent along with structured results, 2 different OBX’s are needed, with OBX-4 identified | |
| OBX-5 | RP | | Observation Value |  |  | |
| OBX-5.1 | ST | | Pointer | URL to the report. The type of file is the extension of the file. ORBIS will open jpg, tiff, png and pdf files. | The syntax of the URL SHALL be conformant  with RFC 1738 and RFC 1808. |
| OBX-5.4 | | ID | Subtype | JPG, TIFF, PNG or PDF |  |

Implementation choices for the URL

* The URL should point to a file on a server directory, accessible by the BPE LAB-3 ORBIS Inbound Interface. The FTP and HTTP protocols are not supported. The URL may reference a file on the local system or on a network drive. The backslash character ‘\’ used as path separator should be represented as ‘\E\’. Examples:
  + Local system: c:\E\directory\E\image.jpg
  + Network drive: \E\\E\server\E\share\E\image.jpg
  + Network drive: /server/share/image.jpg
* The Order Filler is responsible for the URL file to actually be there in time and in the right place. If not, the message is rejected.
* The BPE system is depending on the Operating System’s User having access to that directory
* After BPE has read in the file, the file is stored in the ORBIS database. The file will be added in a queue to be scheduled for deletion. This deletion can be disabled by disabling the last component in the BPE pipeline, BPE\_LAB\_IHE\_LAB3\_RP\_CLEANUP.

# 18 Transaction LAB-51: Laboratory Code Set Management

## Guide of use

The LCSD profile is a must for users buying the lab order module, as it contains mandatory information shared between LIS and CIS to communicate and correctly interpret laboratory orders from CIS to LIS.

The LCSD profile is an option for users only buying the lab resulting module, but with a strong guideline to use LCSD as well.

LCSD contains information about the positioning of tests in a result viewer, and the header/topic structure in which they are reported.

Not having the LCSD in place will result in results being shown in random order, and under a root topic.

The customer can create a custom result view with custom headers and positioning, but new results for tests not present in the custom view will result in not seeing the result!

So in the importance of patient safety, we strongly recommend either to use the LCSD profile if header structure and positioning is needed, or to create any custom view and allow the results to be shown as received by the LIS.

## CPOE guideline for semantic interpretation of one TEST/SERVICE/OBSERVATION/BATTERY.

In all LCSD message types: M08/M09/M10/M11, one test/service/observation/battery object is defined by association of multiple segments, MFE/OM1/[OM2]/[OM3]/[OM4]/[OM5].

In these segments, there are several code identifications possible that can be used by CPOE as OP actor to show available tests/services/batteries to ordering physicians on screen.

This paragraph gives guidelines to code set masters how codes are used by CPOE.

Looking at IHE/HL7 terminology, 2 fields are primary candidate for an OP to use on screen : OM1-2 and OM1-8. Let’s have a look at both.

|  |
| --- |
| **HL7 defintion : OM1-2 Producer's Service/Test/Observation ID (CE) 00587**  Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^  <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate  Coding System (ID)>  Definition: This field contains the producer’s usual or preferred identification of the test or observation. Only three components should be included: <ID code>^<service text name/description>^<sourcelist of code> |
| **IHE filter : OM1-2 MFN Producer’s Service/Test/Observation ID (CE) is required.**  Only the first three subfields (Identifier, Text and Name of Coding System) are required. The last 3 components of the CE data type shall not be valued. |
| **HL7 definition : OM1-8 Other Names (recognized by the producer for the observation) (ST) 00593**  Definition: This field contains any test aliases or synonyms for the name in the context of the ordering service. These are alternative names, not associated with a particular coding system, by which the battery, test, or observation (e.g., measurement, test, diagnostic study, treatment, etc.) is known to users of the system. Multiple names in this list are separated by repeat delimiters. |
| **IHE filter : OM1-8 Other Names (CE), required,**  Contains aliases or synonyms for the name in the context of the Order Placer. By default, this field can contain the same value as OM1-2 (2nd sub-field). |

**Conclusion**: OM1-8 is theoretically the correct field to put codes used by the Order Placer. However, IHE also suggests it can contain the same value as OM1-2 (2nd subfield).

So, CPOE decides to use OM1-2, either code and/or name (1st and/or 2nd subfield) as the code shown to the order placer. It prefers OM1-2 over OM1-8 because the first is a proper CE datatype, while the latter is only an ST.

**Consequences**:

1. A natrium test that can be performed by 2 producers (different laboratory departments), but needs to be shown to the order placer as one common test should be modeled :

|  |  |  |  |
| --- | --- | --- | --- |
| **OM1-2** | **OM1-5** | **OM1-7** | **Shown to OP as** |
| **Na^Natrium^OFS** | Klin Chem 1^SYS | Na1^Natrium1^OFS | Na - Natrium |
| **Na^Natrium^OFS** | Klin Chem 2^SYS | Na2^Natrium2^OFS | Na - Natrium |
| **(OFS=order filler system)** | (SYS=code system for laboratories) |  |  |

Figure 18.4.1: modeling of one natrium test for OP, possibly executed by 2 different departments

1. A natrium test that can be performed by 2 producers, but needs to be shown to the OP as 2 different tess, should be modeled :

|  |  |  |  |
| --- | --- | --- | --- |
| **OM1-2** | **OM1-5** | **OM1-7** | **Shown to OP as** |
| **Na1^Natrium1^OFS** | Klin Chem 1^SYS |  | Na1 - Natrium1 |
| **Na2^Natrium2^OFS** | Klin Chem 2^SYS |  | Na2 - Natrium2 |
|  |  |  |  |

Figure 18.4.2: modeling of two natrium tests for OP, possibly executed by 2 different departments

1. If the order filler system(s) is not able to send the customers intended use for OP (meaning the customer wants to present them as one Na for the OP, but order filler system sends them as Na1 and Na2), then the customer can map the different producer’s test codes to one and create their own code set master LCSD file.

Important: Given that CPOE limits itself to being code set consumer, it does not provide configuration tools for code set master functionality.

|  |  |  |  |
| --- | --- | --- | --- |
| **OM1-2** | **OM1-5** | **OM1-7** | **Shown to OP as** |
| **Na^Natrium^CS** | Klin Chem 1^SYS | Na1^Natrium1^OFS | Na - Natrium |
| **Na^Natrium^CS** | Klin Chem 2^SYS | Na2^Natrium2^OFS | Na - Natrium |
| **(CS= customer or metasystem)** |  |  |  |

Figure 18.4.3: modeling of one natrium test for OP, provided by a meta code set master file, responsibility of the customer.

## Supported transactions & actors

Orbis will support Transaction LAB-51 as **Code Set Consumer** Actor.

LIS or a hospital’s third party supplier supports the Transaction LAB-51 as **Code Set Master** Actor.

## Supported Events

In the tables below, events with a green background are standard IHE; events with a grey background are not supported by CPOE.

## LAB-51

|  |  |  |
| --- | --- | --- |
| **Event** | **Code** | **Event type** |
| Test/Observation (Numeric) | M08 | MFN^M08^MFN\_M08 |
| Test/Observation (Categorical) | M09 | MFN^M09^MFN\_M09 |
| Test/Observation Batteries | M10 | MFN^M10^MFN\_M10 |
| Additional Basic Observation/Service Attributes | M12 | MFN^M12^MFN\_M12 |
| **CPOE Specific** : Charge Description | M04 | MFN^M04^MFN\_M04 |

Note that IHE LCSD always expects the M08, M09, M10 and M12 messages to be sent as a whole, meaning the content has to contain the full list of tests, and the 4 messages have to be sent together every time.

Following table contains guidelines on modeling the content:

|  |  |
| --- | --- |
| **Event Code** | **Usage** |
| M08 | All observations with numerical values. Contains both observations that can be orderable, observations that are clinical observations needed to interpret another orderable observation, and observations only used for result reporting (non-orderable) |
| M09 | All observations with alpha-numerical values. Contains observations that can be orderable, observations that are clinical observations needed to interpret another orderable observation, and where possible values are alphanumerical, and observations only used for result reporting (non-orderable). |
| M10 | Used for 2 main purposes:   1. Used for orderable batteries. It has no added value to put non orderable batteries in here, as the content of such a battery is not used anywhere in ORBIS. ORBIS supports batteries of types :  * P Profile or battery consisting of many independent atomic observations, usually done at one instrument on one specimen. ORBIS will show the contents of the battery when the battery is ordered. * F Functional procedure that may consist of one or more interrelated measures (e.g. glucose tolerance test, creatinine clearance), usually done at different times and/or on different specimens. ORBIS will treat this type of batteries in 2 special ways :   1.detail information will always be popped up to the user when ordering, because planned specimen date/times are mostly more complex.   * S Superset--a set of batteries or procedures ordered under a single code unit but processed as separate batteries (e.g., routines = CBC, UA, electrolytes). This set indicates that the code being described is used to order multiple service/test/observation batteries. ORBIS treats this type in the same way as P.  1. Used to inform the OP on the position of the battery in the cumulative view when order oriented filters are chosen. |
| M12 | Used for storing additional information:  - concent information |
| **CPOE specific:** M04 | THIS MESSAGE IS NOT YET SUPPORTED.  Specific for CPOE, this event is used to send NABM codes linked to observations. It will serve to indicate a price when ordering the test. In this context, it is only needed to send NABM codes for orderable tests/batteries. |

## Supported segments

Segments in the table below with a green background will be supported by Orbis; segments with a grey background will not be supported by Orbis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** | **Comments** |
| MSH | Message Header | R | [1..1] | All events |
| MFI | Master File Identification | R | [1..1] | All events |
| MFE | Master File Entry | R | [1..\*] | All events |
| OM1 | General Segment | R | [1..1] | All events |
| OM2 | Numeric Observation Segment | O | [0..1] | M08 only |
| OM3 | Categorical Test/Observation Segment | RE | [1..1] | M09 only |
| OM4 | Observations that Require Specimens | O | M08[0..1]  M09[0..\*]  M10[0..\*] | All events. In M08, one specimen maximum per test/observation. A test with more than one specimen needed is preferably defined as a battery in M10 |
| OM5 | Observation Batteries Segment | R | [1..1] | Only in M10 |
| OM7 | Additional Basic Attributes | O | [0..1] | Only in M12  Segment is used to contain consent information. |

## Static message definition for MFN^M08

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| MFI | Master File Identification | R | [1..1] |
| { | --- MASTER FILE ENTRY begin | R | [1..\*] |
| MFE | Master File Entry | R | [1..1] |
| OM1 | General Segment | R | [1..1] |
| [OM2] | Numeric Observation Segment | O | [0..1] |
| [OM4] | Observations that Require Specimens | O | [0..1] |
| } | ---MASTER FILE ENTRY end |  |  |

### MSH Segment

The table below contains the fields in the MSH segment supported by the Orbis inbound LAB-51 interface.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSH | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MSH-1 | Field Separator | | | 1 | SI | R | [1..1] |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & | 4 | ST | R | [1..1] |
| MSH-3 | Sending Application | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-4 | Sending Facility | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-5 | Receiving Application | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-6 | Receiving Facility | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MSH-9 | Message Type | MFN^M08^MFN\_M08 | 15 | MSG | R | [1..1] |
| MSH-10 | Message Control ID | Unique identifier of the message | 20 | ST | R | [1..1] |
| MSH-11 | Processing ID | P | 3 | PT | R | [1..1] |
| MSH-12 | Version ID | 2.5 | 60 | VID | R | [1..1] |
| MSH-17 | County code | 3 character ISO code for the country (FRA) | 3 | ID | RE | [1..1] |
| MSH-18 | Character set | ISO-8859-1 or ISO-8859-15  character set | 16 | ID | C | [0..1] |

### MFI Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFI | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MFI-1 | Master File Identifier | OMA | 250 | CE | R | [1..1] |
| MFI-2 | Master File Application Identifier | LIS\_OMA | 180 | HD | R | [1..1] |
| MFI-3 | File-Level Event Code | REP : replace current version of  this master file with the version contained in this message | 3 | ID | R | [1..1] |
| MFI-5 | Effective Date/Time | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MFI-6 | Response level code | ER | 2 | ID | R | [1..1] |

**MFI-3**

IHE defines that, each time, a master data file is sent to the consumer, the whole file is a replacement of the old one. An example of how this is treated when importing in ORBIS is :

V01 (version1) contains ORBIS database contains

OM1-2: TEST7^Acide Urique^LIS TEST7^Acide Urique^LIS (VALID)

OM1-2: TEST9^Glucose^LIS TEST9^Glucose^LIS (VALID)

V02 is sent with

TEST9^Glucose avec libellé modifié^LIS TEST7^Acide Urique^LIS (INVALID)

TEST9^Glucose avec libellé modifié^LIS (VALID)

Conclusion: When a new version is sent to ORBIS, first all existing tests in the database will be put on invalid. After the new version has been read, all tests found in the new version will be put on VALID again, with possible update of attributes like the label in this case. All tests no longer present in the new version will keep the invalid stamp, no longer useable to order in ORBIS

### MFE Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFE | Element name | Comment | LEN | DT | Usage | Card. |
| MFE-1 | Record-Level Event Code | MAD : add record to master file | 3 | ID | R | [1..1] |
| MFE-2 | MFN Control ID | A unique identifier, see comment | 20 | ST | R | [1..1] |
| MFE-4 | Primary Key Value – MFE | See comment below | 200 | Varies | R | [1..1] |
| MFE-5 | Primary Key Value Type | CE | 3 | ID | R | [1..1] |

**MFE-1**

The combination of ‘MAD’ with MFI-3 ‘REP’ implies the following : Each time a new file is sent, the newer file will completely replace the old version of that same file. So each individual record in the new version is a new record, hence the ‘MAD’ value (meaning: add record to master file).

This does not imply that the order forms created by the old version are no longer valid and should be recreated by default. There is an intelligent process in ORBIS that will visually show possible analyses that are no longer valid in an order form and that need maintenance. Explained in a user story below.

**MFE-2**

Definition: A number or other identifier that uniquely identifies this change to this record from the point of view of the originating system. When returned to the originating system via the MFA segment, this field allows the target system to precisely identify which change to this record is being acknowledged.

In other words, it is just a sequence number identifying the unique record in this HL7 file. This sequence number can be different for a new version of LCSD, in contrast to MFE-4 which is the unique identification for the record, no matter in which version of LCSD.

Examples : sequence numbering : 1,2,3,4, 150, 6, 7, 223, …

**MFE-4**

The Primary Key Value in LAB-51 is very important, because unlike you could expect, OM1-2 is NOT A UNIQUE identifier for one record in the file. This field MFE-4 is the unique identifier.

The unique identifier mainly serves to identify & update the information when a new version is imported in ORBIS.

An example:

M08 file could contain

MFE-4 OM1-2 OM1-5

2546^2546^LIS TEST22^Diff Art-veineuse^LIS SLS^256

8697^8697^LIS TEST22^Diff Art-veineuse^LIS TNN^270

### OM1 Segment – General Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **OM1** | **descr** | **Comment** | **LEN** | **DT** | **Usage** | **Card** |
| OM1-1 | Sequence Number – Test/Observation Master File | Unique sequence number in this file, starts with 1, ends with N.  f.e. 1 | 5  **CPOE specific** | NM | R | [1..1] |
| OM1-2 | Producer’s Service/Test/Observation ID | See explanation below.  f.e. TEST1^Ionogramme(Na,K,Cl,Prot)^LIS | 250 | CE | R | [1..1] |
| OM1-3 | Permitted Data Types | Not repeatable field, values supported: NM, DT, TM | 12 | ID | O | [1..1] |
| OM1-4 | Specimen Required | Y/N to inform if an OM4 segment is attached to this record. Limitation in M08 : only 1 specimen can be linked to a test. If you need more than one specimen, use M10. See comment below. | 1 | ID | R | [1..1] |
| OM1-5 | Producer ID | See explanation below  Fe. SLS^256^LIS  OM1-5.1 = code, OM1-5.2 = name, OM1-5.3 = codesys. The code, codesys are required, but the name is optional (f.e. SLS^^LIS or SLS^256^LIS). Sending the name only is not accepted. | 250 | CE | R | [1..1] |
| OM1-7 | Other Service/Test/Observation IDs for the Observation | LOINC codes or other semantic tags  For orderable tests, the mapping to the different orderable tests in the different LIS databases can be put here too  We accept ONLY code^name^codesys, all 3 elements.  More info below | 250 | CE | O | [0..\*] |
| OM1-8 | Other Names | See explanation below  E x. IONO^Biochimie sang | 200  5000 | ST | R | [1..\*] |
| OM1-12 | Orderability | Y/N | 1 | ID | R | [1..1] |
| OM1-18 | Nature of Service/Test/Observation | A (all tests in M08 are atomic tests) | 1 | IS | R | [1..1] |
| **CPOE specific:** OM1-19 | Report Subheader | See explanation below  f.e. ^Ionogramme~^Biochimie sang  OM1-19.2: name , is the most important, because will be shown in result viewer | **250** | **CE** | **RE** | **~~[0..1]~~**  **[0..\*]** |
| OM1-20 | Report Display order | See explanation below  Fe 1 or A. | 20 | ST | RE | [0..1] |
| **CPOE specific:** OM1-30 | Confidentiality Code | See explanation below.  CWE datatype: R (restricted) or no value. | 250 | CWE | O | [0..1] |
| OM1-31 | Observations Required to Interpret This Observation | See explanation below.  Same requirements on subfields as OM1-2, because this field refers to another test. So OM1-31.1 and 31.3 needed at minimum | 250 | CE | O | [0..\*] |
| OM1-37 | Patient Preparation | Used in the nurses worklist to show how patient needs to be prepared for specimen collection | 200 | TX | 0 | [0..1] |

**OM1-2**

Defines code OM1-2.1, name OM1-2.2 and codesystem OM1-2.3 that identifies a test used to order or to report results for.

When to decide to split OM1-2 into 2 different OM1-2 fields?

1. If units differ, or specimen related information is different, you should split up.
2. If the ordering physician should know the difference when ordering, use 2 different OM1-2 tests. For example a similar test that can be ordered on urine or on a blood sample are clearly 2 different tests.
3. Overall : if medically given, either for ordering or result reporting, the tests are different, you have to make sure the OM1-2 field is different.

When not to split?

* If the only difference between 2 OM1 test records is that the test can be produced in 2 different departments, then you can keep the same OM1.2 for both.
* Also, if the container description is different for different laboratories, you do not have to make 2 different OM1.2 tests. Don’t mix this situation with the previous urint versus blood sample example, because there the specimen type is different and medically, you are really referring to 2 different things.

**OM1-4**

In general, a ‘Y’ for an orderable test, a ‘N’ for a test only used for results.

A special case is a test which is orderable, but without a real specimen container description linked to it. Tests which evaluate allergic reactions on the skin have the patient as the specimen container. For these kinds of tests:

Put ‘Y’ in OM1-4 and fill OM4-3 and OM4-6 with value ‘Patient’

**OM1-5**

For orderable tests:

Producer ID plays an important role in multi domain projects (where different physical labo’s are involved). It represents a physical producer of a test, a performing laboratory department for the test. Multiple OM1-5 producer ids may exist for the same OM1-2 code. For example, if a test can be performed at multiple laboratory departments, multiple OM1 records will be represented in the master data files M08, M09, M10 where OM1-2 is the same, but OM1-5 differs.

The OM1-5 producers are then used in the routing rules workflow in ORBIS, where OM1-5 is mapped to a functional unit in the organizational structure of departments. For this purpose, the CE values in OM1-5 have to precisely map to values for laboratory Functional Units.

For results tests (analyses résultat):

As such the producer ID is not needed for results tests, but it is a mandatory field in HL7, and hence there is a technical constraint when this field is empty. Therefore, for test results the field OM1-5 should contain following value:

^-^

**OM1-7**

You can also add a code to semantically tag and identify a clinical observation as a location relevant clinical observation. To do that, add either

* SPM-5^Specimen Type Modifier^AGFA\_ATT to say that the clinical observation is used to indicate the specimen type modifier
* SPM-7^Specimen Collection Method^AGFA\_ATT to say that the clinical observation is used to indicate the specimen collection method
* SPM-8^Specimen Source Site Attribute^AGFA\_ATT to say that the clinical observation is used to indicate the location of a specimen on the body
* SPM-9^Specimen Source Site Modifier Attribute^AGFA\_ATT to say that the clinical observation is used to indicate the location modifier of a specimen on the body, e.g. left or right.
* SPM-10^Specimen Collection Site^AGFA\_ATT to say that the clinical observation is used to indicate the specimen collection site.
* SPM-14^Specimen Descripton^AGFA\_ATT to say that the clinical observation is used to indicate a specimen description

If you have tagged a clinical observation with fe SPM-8, it means that the clinical observation with its possible answers\* will be asked as a question to the user for each specimen linked to the test. The answer will be sent in the SPM-8 field in the LAB-1 communication to the Laboratory system.

\*If there is only 1 possible answer then this value will be auto selected.

See also Use Case 3.2

**OM1-8**

Synonyms are an important part of masterdata used for orderable tests. Searching by synonym in an orbis lab order form will present a list to the ordering physician of all tests with this synonym. You can have as many synonyms as you like.

**OM1-19**

This field is only used in ORBIS for the results.

This field is CPOE specific in its use because HL7 only allows having one header for each test. ORBIS can handle more than one in the application and most customers request this functionality. The solution is to consider this field a Repeating field of datatype CE. Only the second subcomponent is used for this field.

OM1-19.1 should be blank.

OM1-19.2 should be filled with the header text.

**OM1-20**

This field is only used in ORBIS for the results.

Datatype ST needs some explanation. The sort order indicates the position on screen in relation to the other tests. The sorting algorithm is an alphanumerical one, but the guideline is to use numbers, not alphanumerical characters.

For example the left column in the ORBIS viewer containing tests that have results are sorted according to their sorting order column 1 to 6

|  |  |
| --- | --- |
| A0262^Sodium^LIS | 1 |
| A2380^Potassium^LIS | 2 |
| A0079^Chlorures^LIS | 3 |
| A0422^Bicarbonates^LIS | 4 |
| B3990^Protéines^LIS | 5 |
| A0094^Créatinine^LIS | 6 |

**OM1-30**

Results for a test with the R value will only be visualized in the viewer to the ordering prescriber.

**OM1-31**

We recommend not to have tests in M08 that require clinical observations. The reason is that those clinical observations are OM1 records themselves and need to be present in the master data. If all tests that require clinical observations are moved to M10, the interfaces can be sure that the code in OM1-31 pointing to the clinical observation has already been present in M08 or M09.

This way, we avoid expensive cyclic checks when reading in a new master set.

### OM2 Segment – Numeric Observation Segment

The OM2 segment can only be present in the M08 message.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **OM2** | **Descr** | **Comment** | **LEN** | **DT** | **Usage** | **Card.** |
| OM2-2 | Units of Measure | CE datatype , so f.e. mmol/L^mmol/L^LIS  OM2-2.1 : code, OM2-2.2: name, OM2-2.3: codesys. We allow code^^codesys. Or ^name^ | 250 | CE | O | [0..1] |
| OM2-3 | Range of Decimal Precision | NOT SUPPORTED SO FAR. This could become useful in future if exporter rules require this info to do calculus on results. | - | - | - | - |
| OM2-6 | Reference Range | NOT SUPPORTED: Reference ranges vary with each result, and are sent with the results, not in the master data. | - | - | - | - |

### OM4 Segment – Observations that require specimens

The OM4 segment contains specimen related information linked to the test, in order to calculate numbers of containers and information needed on specimen labels.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field** | **Descr** | **Comment** | **LEN** | **DT** | **Us** | **Car** |
| **CPOE-specific :** OM4-3 | container description TX->CE | See explanation below  Fe. SEC\_SG ^Tube sec 5 mL ROUGE | 60, 20^200^20 | TX, CE | **R** | [0..1] |
| **CPOE-specific :** OM4-4 | Container volume | Fe. 2,5 | 20 | NM | O | [0..1] |
| OM4-6 | Specimen type | Fe MAT\_SEC\_SER^Sang^LIS  OM4-6.1 : code, OM4-6.2 : name, OM4-6.3 : codesys. We accept only code^name^codesys. | 250 | CE | O | [0..1] |
| **CPOE-specific :** OM4-8 | preparation | Contains relevant info on how to prepare the tube for sample collection. | 1024 | TX | O | [0..1] |
| **CPOE-specific :** OM4-9 | Special handling requirements | Contains relevant info on how the specimen needs to be handled during transfer from the wards to the laboratory department.  Fe Conserver à + 4° C or Acheminer à température ambiante. | 1024 | TX | O | [0..1] |
| **CPOE-specific :** OM4-10 | Normal collection volume | See explanation below.  Fe 0,2 | 20 | CQ | O | [0..1] |
| **CPOE-specific :** OM4-12 | Not supported  Specimen requirements | See explanation below  Fe Centrifugation,décantation,transport dans la glace | 1024 | TX | O | [0..1] |

**OM4-3**

This field is CPOE specific because the HL7 datatype is a TX only, only allowing one label to describe the container. Some customers requires the use of a short & long label, short label to be used on specimen labels, long label to be used in nursing intervention worklists and on the order form , as detailed information linked to the test/battery.

So the datatype is CE where the first 2 parts are used: short label^long label.

An CPOE BPE component setting needs to be set called: ‘IHE Future’

**OM4-4**

The unit of the container volume is always ml.

**OM4-10**

The unit of the collection volume is always ml.

Calculation of number of containers for one collection of the container type is done as follows:

* Check all tests for that container type that can be collected together and for the same physical destination
* Add normal collection volumes. If you reach more than total collection volume, take another container.

**OM4-12**

NOT SUPPORTED. Reasoning is that the combination of OM1-37, OM4-8 and OM4-9 should provide the necessary functionality for specimen collection and transportation.

## Static message definition for MFN^M09

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| MFI | Master File Identification | R | [1..1] |
| { | --- MASTER FILE ENTRY begin | R | [1..\*] |
| MFE | Master File Entry | R | [1..1] |
| OM1 | General Segment | R | [1..1] |
| [ | ---MF\_TEST\_CAT\_DETAIL begin | O | [0..1] |
| OM3 | Categorical Service/Test/Observation Segment | R | [1..1] |
| [{OM4}] | Observations that Require Specimens | O | [0..\*] |
| ] | ---MF\_TEST\_CAT\_DETAIL end |  |  |
| } | ---MASTER FILE ENTRY end |  |  |

### MSH Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSH | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MSH-1 | Field Seperator | | | 1 | SI | R | [1..1] |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & | 4 | ST | R | [1..1] |
| MSH-3 | Sending Application | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-4 | Sending Facility | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-5 | Receiving Application | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-6 | Receiving Facility | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MSH-9 | Message Type | MFN^M09^MFN\_M09 | 15 | MSG | R | [1..1] |
| MSH-10 | Message Control ID | Unique identifier of the message | 20 | ST | R | [1..1] |
| MSH-11 | Processing ID | P | 3 | PT | R | [1..1] |
| MSH-12 | Version ID | 2.5 | 60 | VID | R | [1..1] |
| MSH-17 | County code | 3 character ISO code for the country (FRA) | 3 | ID | RE | [1..1] |
| MSH-18 | Character set | ISO-8859-1 or ISO-8859-15  character set | 16 | ID | C | [0..1] |

### MFI Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFI | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MFI-1 | Master File Identifier | OMB | 250 | CE | R | [1..1] |
| MFI-2 | Master File Application Identifier | LIS\_OMB | 180 | HD | R | [1..1] |
| MFI-3 | File-Level Event Code | REP | 3 | ID | R | [1..1] |
| MFI-5 | Effective Date/Time | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MFI-6 | Response level code | ER | 2 | ID | R | [1..1] |

### MFE Segment

Identical as in M08

### OM1 Segment – General Segment

Identical as in M08

### OM3 Segment - Categorical Service/Test/Observation Segment

Next to the categorical lab tests,

the OM3 segment is also used to code values of clinical observations required to interpret the lab test observation.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field** | **Descr** | **Comment** | **LEN** | **DT** | **Usage** | **Card.** |
| OM3-1 | Sequence Number - Test/Observation Master File | Unique sequence identifier | 4 | NM | O | [0..1] |
| OM3-2 | Preferred Coding System | Value can be null if the valid coded answers are provided in OM3-3. Value must be ‘ORBIS’ if the valid coded answers are not defined by the code set master actor, but are defined through a catalogue in ORBIS. See use case 3.2 to get more information when to use this. | 250 | CE | O | [0..1] |
| OM3-3 | Valid Coded "Answers" | f.e. Post-opératoire~Pré-opératoire.  The value can be null if and only if OM3.2 has value ‘ORBIS’, because in that case it means the valid answers are not in this code set, but in a catalogue in ORBIS | 250 | CE | O | [0..\*] |

### OM4 Segment

Identical as for M08 segment

Static message definition for MFN^M10

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| MFI | Master File Identification | R | [1..1] |
| { | --- MASTER FILE ENTRY begin | R | [1..\*] |
| MFE | Master File Entry | R | [1..1] |
| OM1 | General Segment | R | [1..1] |
| [ | ---MF\_TEST\_BATT\_DETAIL begin | RE | [0..1] |
| OM5 | Observation Batteries | R | [1..1] |
| [{OM4}] | Observations that Require Specimens | O | [0..\*] |
| ] | ---MF\_TEST\_BATT\_DETAIL end |  |  |
| } | ---MASTER FILE ENTRY end |  |  |

### MSH Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSH | Element name | Value/Comment | LEN | DT | Usage | card |
| MSH-1 | Field Separator | | | 1 | SI | R | [1..1] |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & | 4 | ST | R | [1..1] |
| MSH-3 | Sending Application | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-4 | Sending Facility | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-5 | Receiving Application | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-6 | Receiving Facility | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MSH-9 | Message Type | MFN^M10^MFN\_M10 | 15 | MSG | R | [1..1] |
| MSH-10 | Message Control ID | Unique identifier of the message | 20 | ST | R | [1..1] |
| MSH-11 | Processing ID | P | 3 | PT | R | [1..1] |
| MSH-12 | Version ID | 2.5 | 60 | VID | R | [1..1] |
| MSH-17 | County code | 3 character ISO code for the country (FRA) | 3 | ID | RE | [1..1] |
| MSH-18 | Character set | ISO-8859-1 or ISO-8859-15  character set | 16 | ID | C | [0..1] |

### MFI Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFI | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MFI-1 | Master File Identifier | OMC | 250 | CE | R | [1..1] |
| MFI-2 | Master File Application Identifier | LIS\_OMC | 180 | HD | R | [1..1] |
| MFI-3 | File-Level Event Code | REP | 3 | ID | R | [1..1] |
| MFI-5 | Effective Date/Time | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MFI-6 | Response level code | ER | 2 | ID | R | [1..1] |

### MFE Segment

Identical as in M08

### OM1 Segment – General Segment

In M10, most fields of OM1 are identical in use to the ones in M08 and M09. The ones that are different or extra are discussed below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **OM1** | **descr** | **Comment** | **lEN** | **DT** | **Us** | **Card** |
| OM1-18 | Nature of Service/Test/Observation | See explanation below | 1 | IS | R | [1..1] |

**OM1-18**

In M10, we support following types

|  |  |  |
| --- | --- | --- |
| **Value** | **Description** | **Comment** |
| P | Profile or battery consisting of many independent atomic observations, usually done at one instrument on one specimen | f.e. TEST1^Ionogramme(Na,K,Cl,Prot)^LIS containing tests   |  | | --- | | TEST1A^Sodium^LIS | | TEST1B^Potassium^LIS | | TEST1C^Chlorures^LIS | | TEST1D^Bicarbonates^LIS | | TEST1E^Protéines^LIS | |
| F | Functional procedure that may consist of one or more interrelated measures (e.g.:  glucose tolerance test, creatinine clearance), usually done at different times and/or on different specimens.  ORBIS treats an F type battery specifically, in the sense that when ordering an orderable F battery, the physician will always get a detail screen with info on planned sample collection date/times and relevant specimen containers. | f.e. TEST23^HGPO - Glucose^LIS |
| A | Atomic service/test/observation with clinical observations. A specific guideline of CPOE is that tests with clinical observations attached are best placed in M10, so that the clinical observations are sure to be treated before the test itself. This is an exception to IHE guidance to use M10 only for ‘pure’ batteries. | f.e. TEST37^TP^LIS with clinical observation X1764^Traitement^LIS |
| S | Superset--a set of batteries or procedures ordered under a single code unit but  processed as separate batteries (e.g., routines = CBC, UA, electrolytes)  This set indicates that the code being described is used to order multiple  service/test/observation batteries. For example, a client who routinely orders a CBC,  a differential, and a thyroxine as an outpatient profile might use a single, special code  to order all three test batteries, instead of having to submit three separate order  codes. | Used for combinations of F and or P batteries that are orderable with a single click |

### OM5 Segment – Observation Batteries (Sets) Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OM5 | Element name | Value/Comment | LEN | Dt | Usage | card |
| OM5-2 | Test/Observations Included  within an Ordered Test Battery | f.e. for battery TEST1^Ionogramme(Na,K,Cl,Prot)^LIS, this would be  TEST1A^Sodium^LIS~ TEST1B^Potassium^ LIS ~ TEST1C^Chlorures^ LIS ~  TEST1D^Bicarbonates^ LIS ~  TEST1E^Protéines^ LIS | 250 | CE | O | [0..\*] |

Static message definition for MFN^M12

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Meaning** | **Usage** | **Card.** |
| MSH | Message Header | R | [1..1] |
| MFI | Master File Identification | R | [1..1] |
| { | --- MASTER FILE ENTRY begin | R | [1..\*] |
| MFE | Master File Entry | R | [1..1] |
| OM1 | General Segment | R | [1..1] |
| [ | ---MF\_TEST\_BATT\_DETAIL begin | RE | [0..1] |
| OM7 | Additional Basic Attributes | R | [1..1] |
| ] | ---MF\_TEST\_BATT\_DETAIL end |  |  |
| } | ---MASTER FILE ENTRY end |  |  |

### OM7 Segment – Additional Basic ATTRIBUTES

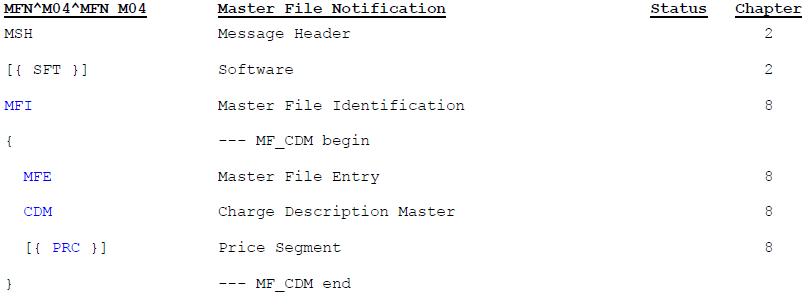
Only applies to orderable tests.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Field | Descr | Comment | LEN | DT | Us | Card |
| OM7-1 | Sequence Number - Test/Observation Master File | Unique sequence number | 4 | NM | R | [1..1] |
| OM7-2 | Universal Service Identifier | Exact reference to the OM1-2 that identifies the observation/service. | 250 | CE | R | [1..1] |
| OM7-11 | Consent indicator | Y/N | 1 | ID | O | [0..1] |
| OM7-12 | Consent Identifier | CE values :LAB^Laboratory^LIS and PAT^Patient^LIS are supported to make the difference between a consent needed by the laboratory or a consent needed by the patient. | 250 | CE | O | [0..1] |

## ~~Static message definition for MFN^M04 : NOT SUPPORTED YET~~

~~Charge description master files (CDM) contain relevant pricing indications related to tests/batteries. It is relevant to indicate pricing info to ordering physicians when ordering laboratory tests.~~

~~All segments and all fields in MFN^M04 are~~ **~~CPOE-specific~~** ~~and not part of IHE currently.~~

~~~~

### ~~MSH Segment~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ~~MSH~~ | ~~Element name~~ | ~~Value/Comment~~ | ~~LEN~~ | ~~DT~~ | ~~Usage~~ | ~~Card.~~ |
| ~~MSH-1~~ | ~~Field Seperator~~ | ~~|~~ | ~~1~~ | ~~SI~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-2~~ | ~~Encoding characters~~ | ~~^~\&~~  ~~Component separator: ^~~  ~~Repetition separator: ~~~  ~~Escape character: \~~  ~~Subcomponent separator: &~~ | ~~4~~ | ~~ST~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-3~~ | ~~Sending Application~~ | ~~e.g. : LIS~~ | ~~227~~ | ~~HD~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-4~~ | ~~Sending Facility~~ | ~~e.g. : LIS~~ | ~~227~~ | ~~HD~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-5~~ | ~~Receiving Application~~ | ~~e.g. : ORBIS~~ | ~~227~~ | ~~HD~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-6~~ | ~~Receiving Facility~~ | ~~e.g. : ORBIS~~ | ~~227~~ | ~~HD~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-7~~ | ~~Date/Time of message~~ | ~~YYYYMMDDHHMMSS~~ | ~~26~~ | ~~TS~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-9~~ | ~~Message Type~~ | ~~MFN^M04^MFN\_M04~~ | ~~15~~ | ~~MSG~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-10~~ | ~~Message Control ID~~ | ~~Unique identifier of the message~~ | ~~20~~ | ~~ST~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-11~~ | ~~Processing ID~~ | ~~P~~ | ~~3~~ | ~~PT~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-12~~ | ~~Version ID~~ | ~~2.5~~ | ~~60~~ | ~~VID~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MSH-17~~ | ~~County code~~ | ~~3 character ISO code for the country (FRA)~~ | ~~3~~ | ~~ID~~ | ~~RE~~ | ~~[1..1]~~ |
| ~~MSH-18~~ | ~~Character set~~ | ~~ISO-8859-1 or ISO-8859-15~~  ~~character set~~ | ~~16~~ | ~~ID~~ | ~~C~~ | ~~[0..1]~~ |

### ~~SFT Segment (not needed)~~

### ~~MFI Segment~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ~~MFI~~ | ~~Element name~~ | ~~Value/Comment~~ | ~~LEN~~ | ~~DT~~ | ~~Usage~~ | ~~Card.~~ |
| ~~MFI-1~~ | ~~Master File Identifier~~ | ~~CDM~~ | ~~250~~ | ~~CE~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFI-2~~ | ~~Master File Application Identifier~~ | ~~LIS \_CDM~~ | ~~180~~ | ~~HD~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFI-3~~ | ~~File-Level Event Code~~ | ~~REP~~ | ~~3~~ | ~~ID~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFI-5~~ | ~~Effective Date/Time~~ | ~~YYYYMMDDHHMMSS~~ | ~~26~~ | ~~TS~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFI-6~~ | ~~Response level code~~ | ~~ER~~ | ~~2~~ | ~~ID~~ | ~~R~~ | ~~[1..1]~~ |

### ~~MFE Segment~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ~~MFE~~ | ~~Element name~~ | ~~Comment~~ | ~~LEN~~ | ~~DT~~ | ~~Usage~~ | ~~Card.~~ |
| ~~MFE-1~~ | ~~Record-Level Event Code~~ | ~~MAD : add record to master file~~ | ~~3~~ | ~~ID~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFE-2~~ | ~~MFN Control ID~~ | ~~A unique identifier~~ | ~~20~~ | ~~ST~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFE-4~~ | ~~Primary Key Value – MFE~~ | ~~Idem comment as in M08 section~~ | ~~200~~ | ~~Varies~~ | ~~R~~ | ~~[1..1]~~ |
| ~~MFE-5~~ | ~~Primary Key Value Type~~ | ~~CE~~ | ~~3~~ | ~~ID~~ | ~~R~~ | ~~[1..1]~~ |

### ~~CDM Segment~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ~~CDM~~ | ~~Element name~~ | ~~Comment~~ | ~~LEN~~ | ~~DT~~ | ~~Usage~~ | ~~Card~~ |
| ~~CDM-1~~ | ~~Primary Key Value - CDM~~ | ~~Equals MFE-4~~ | ~~250~~ | ~~CE~~ | ~~R~~ | ~~[1..1]~~ |
| ~~CDM-3~~ | ~~Charge Description Short~~ | ~~NABM code, f.e. 462\_B70~~ | ~~20~~ | ~~ST~~ | ~~R~~ | ~~[1..1]~~ |

### ~~PRC Segment~~

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ~~PRC~~ | ~~Element name~~ | ~~Comment~~ | ~~LEN~~ | ~~DT~~ | ~~Usage~~ | ~~Card.~~ |
| ~~PRC-1~~ | ~~Primary key value - PRC~~ | ~~Equals CDM-1 Equals MFE-4~~ | ~~250~~ | ~~CE~~ | ~~R~~ | ~~[1..1]~~ |
| ~~PRC-5~~ | ~~Price~~ | ~~CP (composite price) data type. Only the first subcomponent will be used PRC-5.1 Price. No unit necessary.~~  ~~f.e. 1200~~ | ~~12~~ | ~~CP~~ | ~~R~~ | ~~[0..1]~~ |

## Use cases

Use cases contain specification on how ORBIS handles certain aspects of workflow that need to be clarified in order to run interfaces properly.

### Use case 1 : How new master files affect the end-user workflow and administrative work for ORBIS maintenance.

A new master file does not imply any downtime to the end-users creating orders and receiving results.

However, because a new master file can contain tests that are discontinued in a laboratory, or new tests added to the catalogue, there is some work to do.

* In the case of a new test, the test will become orderable from the moment the master data has been imported by the search field in the lab order form. It will not automatically be added to a pre-defined order form. In order to do that, the person maintaining the order form(s) has to add it with the order form setup tool to the desired forms.
* In the case of a deleted test in the master file, the test will no longer be orderable from the moment the master data has been imported. However, the test will still be visible on the created order forms. When a physician checks the test on the form with the intention of ordering the test, the test will be grayed out, and is no longer orderable. It will stay on the order form template as long as the administrator does not remove it from the order form.

### Use case 2 : Modeling example for dynamic tests.

A dynamic test like Glucose is best modeled as a battery of type F with containing tests in OM5 and explicit specification of tubes linked to the battery record.

TEST23 with OM5

|  |  |
| --- | --- |
| TEST23^HGPO - Glucose^LIS |  |
|  | TEST23A^Glucose T0min^LIS |
|  | TEST23B^Glucose T30min^LIS |
|  | TEST23C^Glucose T60min^LIS |
|  | TEST23D^Glucose T90min^LIS |
|  | TEST23E^Glucose T120min^LIS |

OM4 linked to TEST23

|  |
| --- |
| Tube F-Na 5 mL GRIS^SEC\_SG0 |
| Tube F-Na 5 mL GRIS^SEC\_SG30 |
| Tube F-Na 5 mL GRIS^SEC\_SG60 |
| Tube F-Na 5 mL GRIS^SEC\_SG90 |
| Tube F-Na 5 mL GRIS^SEC\_SG120 |

### Use case 3 : Modeling example for microbiology/bacteriologie tests.

Microbiology requires modeling of source site information and context of when tissue has been taken.

The main question when modeling a test for microbiology is how much granularity you have to put in the definition of the test.

Consider both extreme possibilities:

You could have one test defined in OM1.2 as ‘microbiology’ with clinical observation ‘localisation’ and all possible localization values for all microbiology tests. This would lead to very tedious work for the physician ordering the test, because he/she has to explicitly and manually fill in clinical observations.

The other extreme is to have no clinical observations at all and define a different test for all localization possibilities. This extreme is not workable either, as the physician will have difficulty finding the right test, and order forms will be very long and not efficient.

The best solution is a mix of both, with the best practice being to define as much as possible separate tests if they are ordered commonly.

Only for tests not ordered commonly, are clinical observation the better alternative.

Although we cannot really make too much similarities with the LOINC model for ordering (LOINC is made for result reporting), it still is good practice to indicate as much as detail as possible in the test definition itself, without becoming too inflexible.

So different bacteriology definitions like TEST41-47 are fine

|  |
| --- |
| TEST41^Bactériologie : Expecto/Crachats^LIS |
| TEST42^Bactériologie : Asp.Bronchique^ LIS |
| TEST43^Bactériologie : Asp.Trachéale^ LIS |
| TEST44^Bactériologie : PDP^ LIS |
| TEST45^Bactériologie : LBA^ LIS |
| TEST46^Bactériologie : Asp.Naso pharyngée^ LIS |
| TEST47^Bactériologie : Autres bronchiques^ LIS |

With clinical observation

|  |  |
| --- | --- |
| TEST41A^Contexte^ LIS | Post-opératoire~Pré-opératoire |

### Use case 3.1 : modeling a complex clinical observation like ‘localisation’

In HL7 v2.5 and further versions, OM3-3 is only available as a simple list of CE.

For a more complex observation like ‘localisation’ of a microbiology test fe, the answer might be to select a part of the body, based on a hierarchical tree structure, and OM3-3 does not allow for a hierarchy.

The way to model this then is using the following principles:

* A clinical observation fe ‘localisation’ is still needed, in order to indicate for a test that this information is needed.
* The OM3-2 field must be filled with value ‘ORBIS’
* The OM3-3 field must be empty
* A user definable catalogue can be created in ORBIS with the same OM1-2.1 and OM1-2.2 code and name description as the clinical observation.

This solution is possible for all clinical observations in need of a complex hierarchical answer structure, so not only for the observation localisation.

### Use case 3.2 : semantic annotation for certain clinical observations that need to be mapped to specific interface fields like ‘specimen source site’.

On one hand, it is a clear recommendation from laboratory terminology guidelines like LOINC, and transactional frameworks like IHE LAB-TF, to model all information related to a test or specimen as an observation. (For more theoretical background, We refer to <http://loinc.org/downloads/files/LOINCManual.pdf> page 34: Details of specimen collection)

On the other hand, the SPM segment has explicit fields like SPM-8 (Specimen Source Site), SPM-5 (Specimen Type Modifier), SPM-9 (Specimen Source Site Modifier), SPM-10 (Specimen Collection Site), SPM-7 (Specimen Collection Method), SPM-14 (Specimen description) where IHE LAB-TF clearly indicates that in certain conditions the fields must be filled in.

So in order to make the semantical link between fe a clinical observation and SPM-8 that are semantically identical, we use the principle of OM1-7: alternate codes.

In terminologies like SNOMED-CT and LOINC, certain information can be tagged as an attribute of an object. This is exactly what we need.

So let’s say an OM1 record is defining ‘localisation’, and you want to say that this is semantically the same as the specimen source site attribute of the SPM segment,

then you can add the alternate code in OM1-7 : SPM-8^Specimen Source Site Attribute^AGFA\_ATT

AGFA\_ATT stands for Agfa attribute. We cannot use HL7\_ATT yet, because that might be a system term.

Another example, if you want to indicate that a certain OM1 record definition is the model for specimen collection method, you assign the alternate code in OM1-7: SPM-7^Specimen Collection Method^AGFA\_ATT.

The same OM1-7 mechanism can be used to tag :

SPM-5^Specimen Type Modifier^AGFA\_ATT

SPM-7^Specimen Collection Method^AGFA\_ATT

SPM-8^Specimen Source Site Attribute^AGFA\_ATT

SPM-9^Specimen Source Site Modifier^AGFA\_ATT

SPM-10^Specimen Collection Site^AGFA\_ATT

SPM-14^Specimen Description^AGFA\_ATT

### Use Case 4: mODELING tEsts THAT ARE REFERENCED BY OTHER TESTS and relation with header creation

Tests can be referenced by other tests via the following fields (OM1-31, OM5-2).

These references contain only the CE data of the test itself.

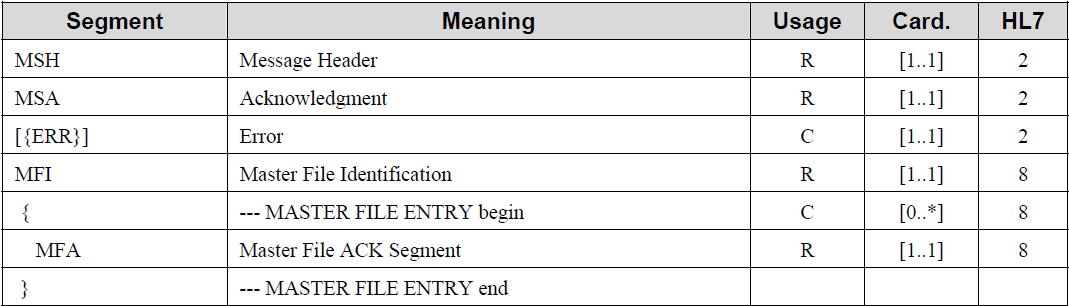
If we want to model more then only the data provided by the CE data type we have to define the test by a proceeding OM1 record.

Consequence for header creation:

When a test is only defined by his reference it will not create a header for this test.

The result will be that this test will not be displayed in the viewer.

## Acknowledge messages



Unlike ADT interfaces, the laboratory related interfaces fully comply with IHE and have to acknowledge messages via an application type message. This means they will send back the acknowledgement message ONLY AFTER parsing the content of the respective M08, M09, M10 and M04 messages to give possibility to report content wise errors.

For all messages discussed in the LCSD profile, the message structure is the same as in picture above.

### MSH Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSH | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MSH-1 | Field Seperator | | | 1 | SI | R | [1..1] |
| MSH-2 | Encoding characters | ^~\&  Component separator: ^  Repetition separator: ~  Escape character: \  Subcomponent separator: & | 4 | ST | R | [1..1] |
| MSH-3 | Sending Application | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-4 | Sending Facility | e.g. : ORBIS | 227 | HD | R | [1..1] |
| MSH-5 | Receiving Application | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-6 | Receiving Facility | e.g. : LIS | 227 | HD | R | [1..1] |
| MSH-7 | Date/Time of message | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MSH-9 | Message Type | MFK^M08 or MFK^M09 or MFK^M10 or MFK^M04 | 15 | MSG | R | [1..1] |
| MSH-10 | Message Control ID | Unique identifier of the message | 20 | ST | R | [1..1] |
| MSH-11 | Processing ID | P | 3 | PT | R | [1..1] |
| MSH-12 | Version ID | 2.5 | 60 | VID | R | [1..1] |
| MSH-17 | County code | 3 character ISO code for the country (FRA) | 3 | ID | RE | [1..1] |
| MSH-18 | Character set | ISO-8859-1 or ISO-8859-15  character set | 16 | ID | C | [0..1] |

### MSA Segment – Message Acknowledgement

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MSA | Element name | Comment/Value | LEN | DT | Usage | Card. |
| MSA-1 | Acknowledgement code | AA (accept), AE (error) or AR (reject) | 2 | ID | R | [1..1] |
| MSA-2 | Message control Id | Equals MSH-10 of incoming message | 20 | ST | R | [1..1] |

# *ERR Segment – Error Segment*

In case MSA-1 is AE or AR , the error segment is sent in the ACK message

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ERR | Element name | Comment | LEN | DT | Usage | Card. |
| ERR-2 | Error Location | If AR, not filled. If AE, contains HL7 field where error occurred. | 18 | ERL | O | [0..\*] |
| ERR-3 | HL7 Error Code | Contains a possible  HL7 Table 0357 - Message error condition codes | 705 | CWE | R | [1..1] |

### MFI Segment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFI | Element name | Value/Comment | LEN | DT | Usage | Card. |
| MFI-1 | Master File Identifier | Same value as in sending message | 250 | CE | R | [1..1] |
| MFI-2 | Master File Application Identifier | LIS\_\*\*\* | 180 | HD | R | [1..1] |
| MFI-3 | File-Level Event Code | REP | 3 | ID | R | [1..1] |
| MFI-5 | Effective Date/Time | YYYYMMDDHHMMSS | 26 | TS | R | [1..1] |
| MFI-6 | Response level code | ER | 2 | ID | R | [1..1] |

### MFA Segment

For each record in a master file that has an error, one MFA record is sent

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MFA | Element name | Comment | LEN | DT | Usage | Card. |
| MFA-1 | Record-Level Event Code | MAD (add record to master file) | 3 | ID | R | [1..1] |
| MFA-2 | MFN Control ID | MFE-2 | 20 | ST | C | [0..1] |
| MFA-4 | MFN Record Level Error Return | S or U (successful or unsuccessful). Second subfield can contain more textual info on the error | 250 | CE | R | [1..1] |
| MFA-5 | Primary Key Value - MFA | Equals MFE-4 | 250 | Varies | R | [1..\*] |
| MFA-6 | Primary Key Value Type - MFA | CE | 3 | ID | R | [1..\*] |

## Extensive list of all use cases with messages

See SIV Validation Document of Piloting Activities.

Of all examples tested in a pilot environment, we kept documentation. These can be made available after a request being sent to CPOE.