

*Laboratory Message Result  
Description*

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<https://www.ehealth.fgov.be/standards/kmehr/en/transactions/laboratory-result-cda>

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## 1. Executive Summary

**Please note for general access:**

**WARNING: the LOINC observation codes used in the examples in this document are just for illustration purposes. (Refer to the chapter 'Codification of the observations' for production guidelines.)**

This document is the functional description based on the use cases that are in scope for the new definition of the Belgian laboratory result message.

These use cases concern the construction of a laboratory message in a CDA format and the sending of that CDA message within a KMEHR message. This laboratory message must be able to identify itself as a temporary, replacement, final or correction version.

This document consists of two parts. It describes the CDA message and it describes how the KMEHR message is constructed based on certain fields from the CDA message.

This document does not aim to explain all the possibilities of the HL7 CDA format<sup>1</sup>. Instead, its focus is to give as pragmatic and concise as possible instructions to create a valid CDA laboratory message attached in a KMEHR message concerning a human patient.

## 2. About this document

This document describes this initiative by describing the CDA message in chapter 6 and the KMEHR message in chapter 7. Definitions of concepts that are used among these chapters are listed in chapter 5.

Chapter 3 controls the document versioning and chapter 4 gives an overview of the referenced documents. Chapter 8 lists definitions of specific terminology or abbreviations used in this document.

This document does not consider details about the follow-up, timing... Please refer to the decisions made on the project management level.<sup>2</sup>

## 3. Document control

Version	Date	Author	Comments
0.01 – 0.03		eHealth Platform	Internal – pre draft, not distributed.

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<sup>1</sup> Please refer to the official HL7 source <http://www.hl7.org> for exhaustive information on all HL7 standards.

<sup>2</sup>For this project, please refer to decisions agreed upon in the architecture workgroup of the eHealth Platform, the message structure workgroup of the eHealth platform and the vision and action points created during the update of the eHealth roadmap. (NL: <http://www.plan-egezondheid.be/>, FR: <http://www.plan-esante.be/>)

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Version	Date	Author	Comments
0.1	28/10/2015	eHealth Platform	First draft version – for limited distribution. Please note this document works on the assumption the HL7 CDA message will be totally included in a KMEHR message.
0.2	18/03/2016	eHealth Platform	Second draft version - for limited distribution. After feedback sessions with stakeholders
0.3	21/04/2016	eHealth Platform	Third draft version – for limited distribution. After feedback session with stakeholders. Alignment with IHE laboratory profile. First final draft.
0.31	19/05/2016	eHealth Platform	Final version for POC Updated with review feedback from stakeholders. Corrected some inconsistencies in examples
0.32	23/05/2016	eHealth Platform	Updated the eHealth Platform OID's to actual OID values.
1.0	5/12/2016	eHealth Platform	Correction of some inconsistencies. Quality control.
1.1	5/1/2017	eHealth Platform	-Clarification a telecom of patient is allowed to have nullflavor -In some instances it was not clear an addr element always should be used with a use attribute

Version	Date	Author	Comments
1.2	18/10/2017	eHealth Platform	<ul style="list-style-type: none"> <li>-Deleted the reference to a schema location in header</li> <li>-extra &lt;entryRelationship&gt; element in &lt;observation&gt; and &lt;act&gt; to model the Belgian statusCode.</li> <li>-Corrected &lt;specimen&gt; tag to &lt;specimen typeCode="SPC"&gt; that was missing in some examples</li> <li>-XSD on IHE website contained an error in the location of the &lt;lab:statusCode&gt; element: the correct location is above &lt;effectiveTime&gt;: that is corrected now in this document too.</li> <li>-KMEHR uses &lt;lnk&gt; element with CDA in Base64</li> <li>-Added in annex standard list how to refer to custom systems</li> <li>-Addition of an optional performer and participant within an observation to clarify subcontracting</li> <li>-Renamed the KMEHR transaction to 'labresult'</li> <li>-Clarified this document vs the general specs</li> <li>-Corrected: lab:precondition was not always accompanied by typeCode="PRCN"</li> <li>-Corrected: &lt;criterion&gt; in &lt;lab:precondition&gt; was not always accompanied by classCode="COND" moodCode="EVN"&gt;</li> <li>-Corrected: addd typeCode and telecom and address in author/representedOrganisation</li> <li>-Corrected: add typeCode with &lt;authenticator&gt;</li> </ul>

Version	Date	Author	Comments
1.3	12/12/2017	eHealth Platform	<ul style="list-style-type: none"> <li>-Corrected some typos</li> <li>-When a test has been done that can only be described in free text, it should be clarified with 'OTH' (other way)</li> <li>-Belgian statuscode was missing in the example of challenge test</li> <li>-Text comment reference should use ' instead of " to prevent certain validation mechanisms from blocking</li> <li>-Empty &lt;code&gt; element when sending a multimedia element should provide a nullFlavor – this is clarified.</li> <li>-Clarified the specific use cases dynamic/challenge testing and embedding multimedia elements in the general description of the blocks</li> <li>-In some cases the country code in the examples was marked as 'BEL' ; this is corrected to 'BE'</li> <li>-Clarified what to do when no detail information is available concerning the specimen</li> </ul>
1.4	23/3/2018	eHealth Platform	<ul style="list-style-type: none"> <li>-Clarified what to do when patient does not have an identifier</li> <li>-The URL's referring to the eHealth Platform website were updated.</li> <li>-Clarified it is recommended to use an actual code to describe what's in a multimedia Base64</li> <li>-Clarified the use of reference values using text</li> <li>-Clarified decimal limiter is always full stop (in conventions chapter 5)</li> </ul>

Version	Date	Author	Comments
1.5	18/5/2018	eHealth Platform	<ul style="list-style-type: none"> <li>-When using codeSystemName attribute, also provide always a codeSystem attribute</li> <li>- In case of missing city information: use the city element with a nullFlavor</li> <li>-Clarification in the use of the participant element</li> <li>-Recommend UTF-8 declaration best added on top of message</li> <li>-Clarification use of time format</li> <li>-Clarification information recipient template reference</li> <li>-documentationOf cardinality changed to 1..N</li> </ul>
1.6	11/10/2018	eHealth Platform	<ul style="list-style-type: none"> <li>-Small clarification that observation.statusCode is allowed to have the different IHE values.</li> <li>-Small error in 6.6.2: classCode was written instead of typeCode in the entryRelationship tag.</li> </ul>

## 4. Referenced documents

Document name	Alias	Owner	Comments
IHE_PaLM_TF_Vol3.pdf	[LABTFV3]	IHE	<p>IHE laboratory technical framework:</p> <p><a href="#">IHE Website link</a> (click on 'Volume3' on that page)</p> <p><a href="http://www.ihe.net/uploadedFiles/Documents/PaLM/IHE_PaLM_TF_Vol3.pdf">http://www.ihe.net/uploadedFiles/Documents/PaLM/IHE_PaLM_TF_Vol3.pdf</a></p>
CDA XSD	[CDA-XSD]	HL7	<p>The XML schema for CDA messages:</p> <p><a href="http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7">http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7</a></p> <p>The laboratory extension to the CDA schema is owned by IHE:</p> <p><a href="ftp://ftp.ihe.net/TF_Implementation_Material/LAB/schemas/cda/infrastructure/cda/">ftp://ftp.ihe.net/TF_Implementation_Material/LAB/schemas/cda/infrastructure/cda/</a></p>

## 5. Concepts and conventions used in this description

### 5.1. Concepts

Ref nr	Concept	Definition	Relation other refs.
D-0001	A valid KMEHR message.	In the use cases, a valid KMEHR message means a XML message that validates on the KMEHR schema and contains all the elements that are needed to rout the message in the hub/metahub system or for deliverance in one or more eHealth Box. The fields that are needed to route this message need to be fetched from the CDA message and mapped correctly to the corresponding KMEHR fields.	
D-0002	Clinical expert	Also “Medical expert” or “Bio-medical scientist” or “Results principal interpreter”: The person who assumes the overall responsibility for the clinical validation and reporting of an order or an order group. <sup>3</sup>	

### 5.2. Conventions

Ref nr	Convention	Relation other convs.

<sup>3</sup>[http://www.ihe.net/uploadedFiles/Documents/Laboratory/IHE\\_LAB\\_TF\\_Vol1.pdf](http://www.ihe.net/uploadedFiles/Documents/Laboratory/IHE_LAB_TF_Vol1.pdf)

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Ref nr	Convention	Relation other convs.
C-0001	<p>This document uses &lt;&gt; to sometimes explicitly refer to an element and not to a functional concept. This is specifically useful when elements in KMEHR and CDA have the same element name but cover different functional aspects.</p> <p>e.g. &lt;author&gt; refers explicitly only to the element in a XML structure that bears this name – not necessarily any functional concept of 'authorship'.</p>	
C-0002	<p>Values are always expressed with the 'full stop' or point (.) as decimal mark. No commas are used to make numbers easier to read. (e.g. ten thousand is always written as '10000' – never as '10,000' or '10.000')</p>	

## **6. Description of the HL7 message.**

### ***6.1. CDA Levels***

A CDA message can be defined on three different levels, depending on how the actual clinical information is presented in the body of the message. These used to be referred to as the levels one to three in CDA jargon respectively.

#### **6.1.1. Unstructured**

This consists of unstructured free text, using a <text> element with extensive HTML formatting. This should always be the last resort when constructing the CDA message.

The laboratory report must not be send this way.

#### **6.1.2. Partially structured**

This is also free text but with some structure in it. Using the proper HTML content tags, receiving parties should at least be able to visually represent the information in a coherent way.

The laboratory report must not be send this way.

#### **6.1.3. Completely structured report**

A completely structured report is a report that uses the highest levels of coding and structure. This will create a maximum level of interoperability between exchanging systems.

On this level, it has been decided to use the subset of LOINC codes as defined by the FPS Health and UCUM preferentially and as much as possible (cfr. Infra for actual rules about this)

The CDA laboratory message must use this level.

### ***6.2. High level Structure of a CDA***

Functionally, there are two parts in a CDA message: a header and a body. The header is the collection of all the elements except one directly in the root element <ClinicalDocument>.

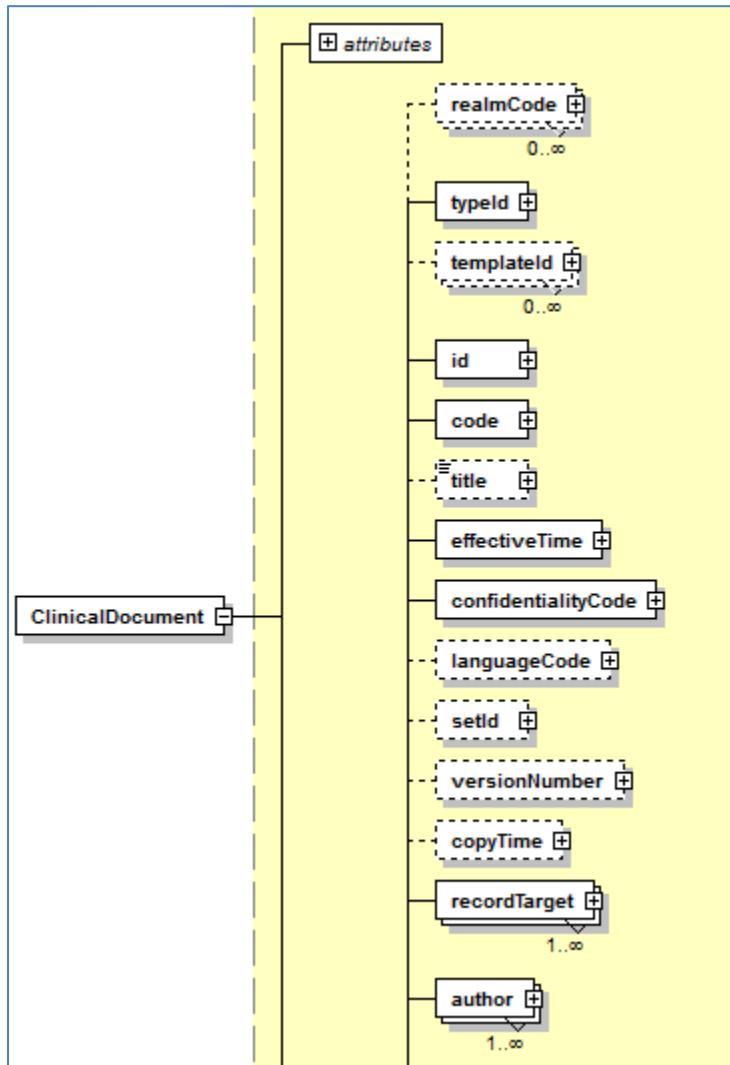


Figure 1 - Fragment of the CDA header

The one element in the root that is not part of the functional header is the element `<component>`.

This element `<component>` contains the body of the message:i.e.either an element with the name `<structuredBody>` or a`<nonXMLBody>`.

Note within a `<structuredBody>`, the CDA can contain partially structured elements and/or completely structured elements. The `<nonXMLBody>` only contains unstructured text.

The CDA laboratory message must use the `<structuredBody>`.

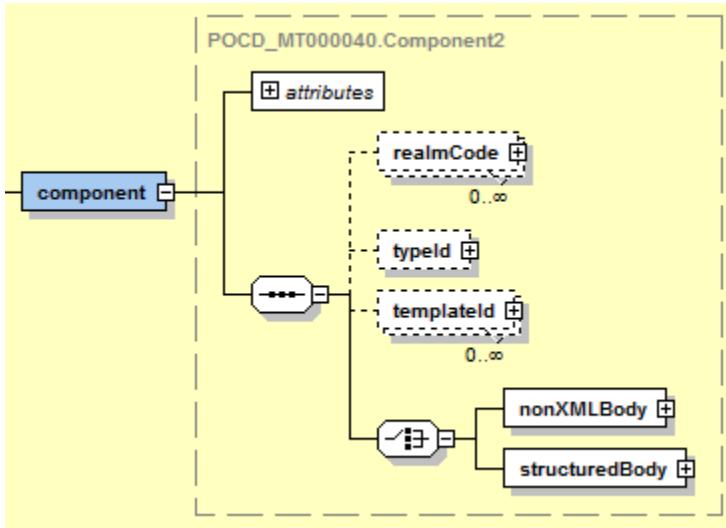


Figure 2 - The component element in the CDA root

That body takes the form of different statements represented by <component>, <section> and <entry> elements.

### **6.3. General remarks on the HL7 CDA XML**

#### **6.3.1. UTF 8**

The HL7 CDA message is considered to be UTF-8. It is recommended to declare the use of UTF-8 at the top of the XML.

#### **6.3.2. The HL7 CDA XSD**

The message must validate on the CDA XSD with its IHE laboratory extension.

This document should be read together with the CDA XSD as reference material.

The different tables in this document describe how to create a CDA XML in the Belgian laboratory context for human patients.

Many elements, attributes and technical possibilities of the CDA XSD will be ignored in this document.

Sometimes an element is marked as mandatory in the tables in this document where the XSD might mark them as optional.

**The main goal of this document is to describe the minimal set of rules to get a laboratory result message for a human patient that will be valid in the Belgian context. Software systems should always take into account that in other use cases, elements of the HL7 CDA XSD or the IHE laboratory profile might be used that are not explicitly referenced in this document.**

Please note the CDA XSD makes extensive use of attributes within elements to define its content instead of enclosing the actual content between tags. This is an essential difference compared to the way information is usually contained in a KMEHR message.

### 6.3.3. The IHE Laboratory profile

The rules in this document follow very closely the general IHE laboratory profile but certain elements are defined in a more strict way. E.g. the code to use in an observation must come from the Belgian ‘Retam’ subset.

Also, the accepted values of the statuscode of an observation or a group of observations differ from what is described in the IHE profile; a Belgian set is used for this to provide extra information using an extra <entryRelationship> element.

### 6.3.4. nullFlavor attribute

Please refer to the XSD to determine which elements are allowed to use the nullFlavor attribute.

The nullFlavor attribute makes an important contribution to specify whether information is absent because it was not known or simply not asked or unavailable.

The nullFlavor attribute is used to provide more information about the absence of information.

Here a description of most used NullFlavor codes:

Value	Comment	Definition
UNK	Unknown	A proper value is applicable, but not known.
NASK	Not Asked	This information has not been sought (e.g., patient was not asked)
ASKU	Asked but Unknown	Information was sought but not found (e.g., patient was asked but didn't know)
NAV	Temporarily Unavailable	Information is not available at this time but it is expected that it will be available later.
NI	No information	No information whatsoever can be inferred from this exceptional value
OTH	Other	This is sometimes used to denote there simply is no code available
MSK	Masked	There is information on this item available but it has not been provided by the sender due to security, privacy or other reasons
NA	not applicable	There are no proper value for this context

e.g. <addr nullFlavor = “NASK”/>

This means an address was not asked. Note this example only contains attributes and no actual value.

In the laboratory message, the nullFlavor functionality is only allowed in those instances explicitly mentioned in this document.

### **6.3.5. Use of OID**

CDA makes use of OID's to identify other systems/objects.

Some of these already exist, some are created for this message. Refer to the list in Annex.

### **6.3.6. Important time elements**

These are all detailed in the tables and overviews infra but for clarification purposes: these important time elements are included in the CDA laboratory message:

#### **6.3.6.1. Time of the prescription**

For the time of the prescription, the element <participant> is used in the root of the document with the typeCode 'REF' to identify this participant as the 'ordering provider'.

As such it follows the rules as outlined in the IHE Technical Framework but note this element does not contain any extra commenting info labelling this explicitly the 'prescription time'.

#### **6.3.6.2. Specimen collection and specimen reception**

##### ***6.3.6.2.1. Time of the specimen collection (required)***

The time of the collection of the specimen is expressed in an element <procedure>

[...]

```
<procedure classCode="PROC" moodCode="EVN">
  <!-- Use this OID to refer to the HL7 template code of Specimen Collection -->
  <templateId root="1.3.6.1.4.1.19376.1.3.1.2"/>
  <!--The LOINC code to refer to the collection date of a specimen -->
  <code code="33882-2" codeSystem="2.16.840.1.113883.6.1"/>
  <effectiveTime value="20140412"/>
[.]
```

NB although this element is required – this time can be unknown

```
<effectiveTime nullFlavor="UNK">
```

##### ***6.3.6.2.2. Time of the specimen reception (required)***

Time of specimen reception needs also to be defined:

Time of the reception of a specimen is expressed in an element <act>.

[...]

```
<act classCode="ACT" moodCode="EVN">  
  <!-- Use this OID to refer to the HL7 template code of Specimen reception -->  
  <templateId root="1.3.6.1.4.1.19376.1.3.1.3"/>  
  <!--use the IHE code to express this is about receiving the specimen -->  
  <code code="SPRECEIVE" codeSystem="1.3.5.1.4.1.19376.1.5.3.2"  
        codeSystemName="IHEActCode"/>  
  <effectiveTime value="20140412"/>  
[...]
```

NB although this element is required – this time can be unknown:

```
<effectiveTime nullFlavor="UNK">
```

### **6.3.6.3. Time when the report is created.**

The report creation time is part of the <documentationOf> element in the root of the document. The CDA XSD demands this is modelled using a ‘high’ and ‘low’ value.

```
<documentationOf>  
  <serviceEvent>  
    <effectiveTime>  
      <low value="20080104000000.0000-0500"/>  
      <high value="20080108000000.0000-0500"/>  
    </effectiveTime>
```

### **6.3.7. Decimal delimiter**

In all values, the decimal delimiter is a point.

### **6.3.8. codeSystem and codeSystemName attributes**

The CDA standard contains multiple uses of the attributes ‘codeSystem’ and ‘codeSystemName’ This is described in the chapters infra detailing the CDA header and body. The attribute

'codeSystem' uses an OID to refer to a coding system and the attribute 'codeSystemName' contains the actual name of the coding system.

Even though the OID in theory is enough to refer to a coding system in a unique way, it is considered a good practice to also provide the attribute codeSystemName.

Please note the attribute 'codeSystemName' shall never be used without the attribute 'codeSystem.' In special cases where a coding system is referenced by name but no OID exists, the attribute 'codeSystem' shall be given with the value 0.

## **6.4. CDA Header**

### **6.4.1. Some elements explained**

Please refer to the structured overview in 6.4.2 for an overview and examples of all minimally required elements in the Belgian laboratory message.

This chapter focuses on some elements from the CDA schema that might benefit from some extra explanation.

#### **6.4.1.1. <setId> and <versionNumber>**

The <setId> element contains a unique value that is common to the laboratory report and any replacements or correction send for that report. As such, this element must be included and is vital to support the various use cases.

The <versionNumber> is each time incremented by 1 whenever a new version of the document with the same <setId> is being sent. (cfr. infra)

#### **6.4.1.2. The <author> in CDA and KMEHR**

The <author> in CDA is the element that contains the credentials of the sending system that creates the message.(Not to be confused with author in KMEHR.)The CDA laboratory message must have at least 1 <author>.

#### **6.4.1.3. The <authenticator> and <legalAuthenticator> in CDA**

The <authenticator> is the party that confirms the report is coherent with what is in the sending system. 1 or more <authenticator> must be defined on the header level.

The Belgian CDA laboratory message must contain at least one <authenticator>.

The CDA concept and element <legalAuthenticator> must not be used in this message.

#### **6.4.1.4. The generic participant element in CDA**

The participant in the header of the CDA is an element that is not absolutely required according to the XSD schema<sup>4</sup> but it is required in the laboratory result described in this document.

In general, this element is used for any *participant* in the message that cannot be represented using one of the other elements. In the laboratory result message however, this element is used to model the *time of the prescription*. This is done by defining this element as an abstract 'ordering provider'. Cfr. Infra for the concrete implementation.

#### **6.4.1.5. <custodian>**

This is the NIHI<sup>5</sup> number (if known) and the name of the laboratory of the sending laboratory.The sender element in the KMEHR wrapper message maps with this information.

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<sup>4</sup> [LABTFV3] §524

#### **6.4.1.6. <informationRecipient>**

This is the NIHI number (if known) and the name of the receiving party/ies.

The recipient element in the KMEHR wrapper message maps to this information.

#### **6.4.1.7. <inFulfillmentOf>**

Used to refer to the ordernumber(s) of the prescription.

#### **6.4.1.8. <documentationOf><sup>6</sup>**

The <documentationOf> element is a vital element to support the final/replace use cases.

This follows the guidelines as defined in the IHE Laboratory Technical Framework.

This is used to identify the time when these results were done by the laboratory .

This time needs to be defined by using a low and high value which will be the same to define a point in time. (i.e. the point in time when the results were done.)

The <documentationOf> element contains a special element <lab:statusCode> that defines whether the document is actually considered final or not.

See infra in the table for the actual descriptions to use.

Please note a CDA that replaces a previous report also must contain a reference to that previous report. That reference is not in the <documentationOf> element but in the <relatedDocument> element cfr. infra.

#### **6.4.1.9. <relatedDocument><sup>7</sup>**

The <relatedDocument> element must be present in the CDA whenever a CDA replaces a previous version.

Note an older version of a document may never replace a newer one!

This follows the guidelines as defined in the IHE Laboratory Technical Framework.

In other words: if the use case is to replaceor correct a previous CDA – this element must be present. Refer to the table infra for the structure.

A new version of a document uses the common <setId> to link to the previous version and it will also include the actual individual Id number of the document that is being replaced by this new document.

The version number of the document is incremented by 1 whenever a new version is sent.

Note the use case where a final report is corrected is done by replacing a final report with a new final.

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<sup>5</sup>National Institute Health and disability Insurance (<http://www.riziv.fgov.be>)

<sup>6</sup> [LABTFV3] §560

<sup>7</sup> [LABTFV3] § 590 Footnotes 1-2-3 describe this mechanism

#### **6.4.1.10. <authorization> and <consent>**

The authorization/consent element is an optional element in the CDA structure and are being used to register some level of consent in the message.

In the Belgian context, however, this is not done on the level of this document and these elements must not be used.

#### **6.4.1.11. <componentOf>**

This element allows the description of an encounter. This element must not be used in the laboratory message.

### 6.4.2. Structured overview

The CDA header is a combination of different elements on the highest level of a CDA message.

**L= Level, C = Cardinality.**

**Rows with a grey background indicate an opening or closing to a different level.**

**'...../' in the second column indicates the opening of an XML tag.**

**'/.....' In the second column indicates a closing of an XML tag.**

L	Element/Path	C	Description	Use of attributes, recommended value / example
0	ClinicalDocument/	1	Defines the namespace of this message	<p>CONSTANT</p> <p>Fixed value to reference the CDA with laboratory extension.</p> <pre>&lt;ClinicalDocument   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"   xmlns="urn:hl7-org:v3"   xmlns:lab="urn:oid:1.3.6.1.4.1.193   76.1.3.2"&gt;</pre>
1	realmCode	1	Refers to the realm Belgium with code attribute.	<p>CONSTANT</p> <pre>&lt;realmCode code="BE"/&gt;</pre>

L	Element/Path	C	Description	Use of attributes, recommended value / example
1	typeId	1	The version of CDA used is CDA R2.	CONSTANT  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
1	templateId	4	To identify the Belgian implementation standard is being followed.  The last one is the OID of the XD-LAB report.	CONSTANT  <templateId root="2.16.840.1.113883.3.6777.1 1.1"/>  <templateId root="2.16.840.1.113883.3.6777.1 1.1.1"/>  <templateId root="2.16.840.1.113883.3.6777.1 1.1.1.3"/>  <templateId root="1.3.6.1.4.1.19376.1.3.3"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
1	id	1	<p>This is the document identifier that uniquely identifies the document by the sending authority.</p> <p>If a document has multiple versions that replace each other, they each have a unique id but will share a common setId (cfr. infra)</p> <p>In KMEHR: used as the id in the Header.</p>	<p><u>Use the mechanism as proposed in KMEHR to generate a unique id within the Belgian telematics system<sup>8</sup>.</u></p> <pre>&lt;id root="2.16.840.1.113883.3.6777.1. 1"extension= "11530231003.2010050509300000 00"/&gt;</pre>
1	code	1	<p>The subject of this specialty, expressed in a LOINC code.</p> <p>Use the LOINC code for 'LABORATORY STUDIES' if this CDA contains multiple laboratory specialties.</p> <p>Cfr. Annex for allowed codes (CDA Laboratory Specialty codes)</p>	<pre>&lt;code code=" 26436-6" codeSystem="2.16.840.1.113883.6. 1" codeSystemName="LOINC" displayName="LABORATORYSTUDI ES"/&gt;</pre>
1	title	0..1	The title of the document in free text. This must be in line with the values given in 'code.'	<pre>&lt;title&gt;Laboratory Report, Allergy and Hematology Studies&lt;/title&gt;</pre>

<sup>8</sup>The value must be the concatenation of the *NIHI* of the first mentioned sending party, a dot, and a unique message number within your own system. This latest can be easily implemented through a timestamp like *YYYYMMDDHHMMSSmm*. In addition to this, you can always add your own local message identifiers. It is suggested to use the same system as used in KMEHR because of the wrapping within a KMEHR message. This way the <id> of the CDA message can easily be mapped with the KMEHR message.

L	Element/Path	C	Description	Use of attributes, recommended value / example
1	effectiveTime	1	<p>The creation of the CDA.</p> <p>A quantity specifying a point in time. Expressed as an alphanumeric string compliant with the ISO 8601 standard.</p> <p>The valid format is YYYYMMDDHHMMSS.UUUU[+ -ZZzz]</p> <p>Digits can be omitted from right to left to express less precision.</p> <p>Each part shall be given completely: e.g. include SS, never include just S.</p> <p>e.g. OK: 20151104113900+0100</p> <p>e.g. NOK: 2015110411390+0100</p> <p>The most common formats are YYYYMMDD or YYYYMMDDHHMM, but all legal "precision" values are allowed. These range from specifying only the year (e.g. YYYY) to specifying a precision of 0.0001 seconds (YYYYMMDDHHMMSS.UUUU). The optional addition of [+ -ZZzz] specifies the time zone as an offset from universal coordinated time (UCT).</p>	<effectiveTime value="201404121441+0100"/>
1	confidentialityCode	1	Always use 'N' and "Normal." <sup>9</sup>	<p>CONSTANT</p> <pre>&lt;confidentialityCode code="N" codeSystem="2.16.840.1.113883.5. 25" displayName="Normal"/&gt;</pre>

---

<sup>9</sup> It is possible to use R (with displayName = "restricted") for possible use of patient restriction. At this time, always use 'N'.

L	Element/Path	C	Description	Use of attributes, recommended value / example
1	languageCode	1	To define the language of the CDA document. This is only done here and it is only done once.  All other elements in the CDA must not use a languageCode.	<u>Use only one of these four:</u>  <u>When message is in German:</u> <code>&lt;languageCode code="de-BE"/&gt;</code>  <u>When message is in French:</u> <code>&lt;languageCode code="fr-BE"/&gt;</code>  <u>When message is in Dutch:</u> <code>&lt;languageCode code="nl-BE"/&gt;</code>  <u>When message is in English:</u> <code>&lt;languageCode code= »en-BE »/&gt;</code>
1	setId	1	setId and versionNumber are used together.  setId identifies the group of documents and versionNumber is incremented by 1 with each new version.  This is vital for sending new versions or replacements of documents.	<u>Use an UID as root attribute and a string as extension. Together they identify the set.</u>  <code>&lt;setId extension="54ZETZER" root="c30f21a4-09f4-11e5-a6c0-1697f925ec7b"/&gt;</code>
1	versionNumber	1	cfr. setId supra	<u>Increment by 1 with each new version that replaces or corrects a previous version</u>  <code>&lt;versionNumber value="1"/&gt;</code>

L	Element/Path	C	Description	Use of attributes, recommended value / example
1	recordTarget/	1	RecordTarget with its typeCode is fixed value. The elements within the recordTarget element represent the medical record that this document belongs to.	CONSTANT <recordTarget typeCode="RCT">
2	patientRole/	1	Fixed. This tag begins the actual patient information.	CONSTANT <patientRole classCode = "PAT">
3	id	1..*	The number from the National Registry must identify the patient. The National Registry is identified by the OID "2.16.840.1.113883.3.6777.5.1", the extension is the actual INSS number.  Cfr. Annex for possible other nationalities.  NB When the patientidentifier is not available, use the <id> element with a nullFlavor. (Although normally it is allowed to use multiple <id> here, when nullFlavor is used only 1 <id> is allowed here): <id nullFlavor="NI"/>	<u>Use the extension attribute to include the actual INSS number.</u>  <id root="2.16.840.1.113883.3.6777.5.1" extension="67032537742"/>
3	addr/ <sup>10</sup>	1..*	BEL_AdressUse is subset from a general HL7 set. (cfr. Annex)	<u>Use one of the values as defined in BEL AdressUse<sup>11</sup></u>  <addr use ="HP">

<sup>10</sup> Please refer to the XSD for the cardinality in addr: most of the elements in the addr element are part of one optional choice element.

<sup>11</sup> A code for a 'care address' is not available at this time but not priority for the lab message. Refer to the Annex for the full table.

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	country	0..1	Specifies the country, based on the ISO-3166-1 country code <sup>12</sup>	<country>BE</country>
4	city	1	The city, in case this cannot be provided, use a nullFlavor	<city>GRIMBERGEN</city> <city nullFlavor="NA"/>
4	postalCode	1		<postalCode>1850</postalCode>
4	houseNumber	0..1		<houseNumber>26</houseNumber>
4	houseNumberNumeric	0..1	Optional extra identifier for housenumber.	<houseNumberNumeric>A</houseNumberNumeric>
4	streetName	0..1		<streetName>Labradorstraat</streetName>
4	postBox	0..1	Optional postbox information	<postBox>45</postBox>
4	streetAddressLine	0..1	This is an alternative way to model an address and can be used to contain street, number and postbox information in one tag. This tag must not be used if other tags are used that contain (part of) the same information.	<streetAddressLine>Labradorstraat 26A Bus 45</streetAddressLine>
4	additional locator	0..1	Any optional extra information about the address	<additionalLocator>House next to water</additionalLocator>
3	/addr			</addr>

<sup>12</sup>Use the 2 letter country code here, as also defined in KMEHR as CD-FED-COUNTRY (<https://www.ehealth.fgov.be/standards/kmehr/en/tables/fedict-country-codes>)

L	Element/Path	C	Description	Use of attributes, recommended value / example
3	telecom	1..*	<p>BEL_TelecomTypePartCode is a custom list created to define the type of telecom.</p> <p>BEL_AddressUse is subset from general HL7 set.</p> <p>Cfr. Annex for these lists.</p> <p>Note for a patient without telecom information, it is allowed to use:</p> <pre>&lt;telecom nullFlavor="NI"/&gt;</pre>	<p><u>Use one of the values as defined in BEL_TelecomTypePartCode to add to the actual value string of the telecom value<sup>13</sup> (as in the example) to define what type of telecom.</u></p> <p><u>Use one of the values as defined in BEL_AddressUse<sup>14</sup> to define the use.</u></p> <pre>&lt;telecom value="tel:+3225258787" use="HP"/&gt;</pre> <pre>&lt;telecom value="mailto:jan.janssen@skynet.be" use="HP"/&gt;</pre>
3	patient/	0..1	Refers to the subject being a person.	CONSTANT: <pre>&lt;patient classCode="PSN"&gt;</pre>
4	name/	1		<pre>&lt;name&gt;</pre>
5	family	0..1		<pre>&lt;family&gt;Dupont&lt;/family&gt;</pre>
5	given	0..*		<pre>&lt;given&gt;Jean&lt;/given&gt;</pre>
4	/name			<pre>&lt;/name&gt;</pre>

<sup>13</sup> Cfr. Anex for the actual way how to structure the values (e.g. using '+' in a telephone number)

<sup>14</sup> A code for a 'care address' is not available at this time in that table and will be added in future Bel\_AddressUse

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	administrativeGenderCode	1	Constant except the actual code: M, F or UN (= undifferentiated) and the displayName.	<administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1" codeSystemName="HL7" displayName="Male"/>
4	birthTime	1	Format YYYYMMDD	<birthTime value="19860101"/>
3	/patient			</patient>
2	/patientRole			</patientRole>
1	/recordTarget			</recordTarget>
1	author/	1	Credentials of the sending system	<author typeCode="AUT">
2	time	1	Mandatory element in CDA but not used for Belgian laboratory message. Time or nullFlavor may be used.	<time nullFlavor="NI"/>
2	assignedAuthor/	1		<assignedAuthor>
3	id	1	Required element in CDA. Not used for Belgian laboratory message.	CONSTANT: <id nullFlavor="NI"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
3	addr	1..*	as defined supra	<addr use ="WP"> <country>BE</country> <city>ROUX</city> <postalCode>6044</postalCode> <houseNumber>6</houseNumber> <streetName>Rue du George</streetName> </addr>
3	telecom	1.. *	as defined supra	<telecom value="tel:+3225258787" use="HP"/>
3	assignedAuthoringDevice/	1	The actual system	<assignedAuthoringDevice>
4	softwareName	1	The name of the LIS package.	<softwareName>Test-IT LabSoft</softwareName>
3	/assignedAuthoringDevice			</assignedAuthoringDevice>
3	representedOrganization/	0..1	The represented organization will be the laboratory.	<representedOrganization>

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	id	1	The NIHI number of the laboratory should be used here – if known. 'Root' value contains an OID that refers to NIHI. "extension" refers to actual NIHI number.	<id extension="81165343998" root="2.16.840.1.113883.3.6777.5. 2" assigningAuthorityName="NIHI"/>
4	name	1		<name>Hospital Laboratory</name>
4	telecom	1	Telecom as supra or use nullFlavor	<telecom nullFlavor="NI"/>
4	addr	1	Addr as supra or use nullFlavor	<addr nullFlavor="NI"/>
3	/representedOrganization			</representedOrganization>
2	/assignedAuthor			</assignedAuthor>
1	/author			</author>
1	custodian/	1	Fixed.  CDA demands 1 custodian element.  This contains the NIHI number (if known) and the name of the sending laboratory.	CONSTANT:  <custodian typeCode="CST">
2	assignedCustodian/	1	Fixed.	CONSTANT:  <assignedCustodian classCode="ASSIGNED">
3	representedCustodian Organization/	1	Fixed.	CONSTANT:  <representedCustodianOrganization>

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	id	1	In CDA, multiple ids are allowed but only 1 name. Use the highest level here: in case the information available is an organization and an individual: pick the organization. (Cfr. Chapter 'Some elements explained') This is the NIHI number (if known.)	<id root="2.16.840.1.113883.3.6777.5. 2" extension = "81165343998" assigningAuthorityName = "NIHI"/>
4	name	1	Note this is different from the 'name' element used to describe a person.	<name>The Laboratory</name>
4	telecom	1	Telecom as supra or use nullFlavor	<telecom nullFlavor="NI"/>
4	addr	1	Addr as supra or use nullFlavor	<addr nullFlavor="NI"/>
3	/representedCustodianOrganization			</representedCustodianOrganization>
2	/assignedCustodian			</assignedCustodian>
1	/custodian			</custodian>
1	informationRecipient/	0..*	Multiple recipients may be provided.	CONSTANT:  <informationRecipient typeCode="PRCP">
2	templateId	1		CONSTANT:  <templateId root="1.3.6.1.4.1.19376.1.3.3.1.4"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
2	intendedRecipient/	1		CONSTANT: <intendedRecipient>
3	id	1..*	If needed multiple id's to also represent the NISS number. Provide in any case the NIHI if this number is known.	<id root="2.16.840.1.113883.3.6777.5. 2" extension = "10051178001" assigningAuthorityName = "NIHI"/>
3	addr	1..*	Addr as supra or use nullFlavor	<addr nullFlavor="NI"/>
3	telecom	1..*	as defined supra	<telecom use="HP" value="tel:+3225258656"/>
3	informationRecipient/	0..1	<b>Note at least the InformationRecipient OR the receivedOrganization must be given on this level.</b>	CONSTANT: <informationRecipient typeCode="PRCP">
4	name	1	as defined supra	<name> <family>McCoy</family> <given>Leonard</given> </name>
3	/informationRecipient			</informationRecipient>
3	receivedOrganization/	0..1	Optional element to define the organization of the receiver. <b>Note at least the InformationRecipient OR the receivedOrganization must be given on this level.</b>	<receivedOrganization>

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	id	0...*	The root attribute should refer to the organization that handed out the OID. Use the NIHI number if known.	<id root="2.16.840.1.113883.3.6777.5.2" extension = "10051178001" assigningAuthorityName = "NIHI"/>
4	name	1...*	the name of the organization; Note this is different from the 'name' element used to describe a person	<name>Hospital Laboratory</name>
4	telecom	1..*	Telecom as supra or use nullFlavor	<telecom nullFlavor="NI"/>
4	addr	1..*	Addr as supra or use nullFlavor	<addr nullFlavor="NI"/>
3	/receivedOrganization			</receivedOrganization>
2	/intendedRecipient			</intendedRecipient>
1	/informationRecipient			</informationRecipient>
1	authenticator/	1..*	The authenticator is an obligatory element. This is the party that confirms the report is coherent with what is in the sending system.	<authenticator typeCode="AUTHEN">
2	templateId	1	Fixed. This is the 'Laboratory Result Verifier' template.	CONSTANT: <templateId root="1.3.6.1.4.1.19376.1.3.3.1.5"/>
2	time	1	Time is obligatory tag in XSD.	<time nullFlavor="NI"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
2	signatureCode	1	This element is used to explain this party confirms the report conforms to what is in the sending system. This is an obligatory element in the CDA structure.	CONSTANT: <signatureCode code="S"/>
2	assignedEntity/	1		<assignedEntity>
3	id	1...*	Multiple id's can be given but use at least the NIHI information of this actual party if known.	<id extension="554488997" root="2.16.840.1.113883.3.6777.5.2" assigningAuthorityName="NIHI"/>
3	addr	1..*	As defined supra	<addr use="WP"> <country>BE</country> <city>ROUX</city> <postalCode>6044</postalCode> <houseNumber>6</houseNumber> <streetName>Rue du George</streetName> </addr>
3	telecom	1..*	As defined supra	<telecom value="tel:+3225258787" use="HP" />
3	assignedPerson/	1	Name information of this authenticator	<assignedPerson>

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	name	1	As defined supra (family and given name)	<name> <family>Davout</family> <given>Louis</given> <given>Nicolas</given> </name>
3	/assignedPerson			</assignedPerson>
3	representedOrganization/	0..1	Optional – if this authenticator is part of an organization.	<representedOrganization>
4	id	1	The NIHI information of the organization (e.g. a hospital laboratory)	<id extension="234543543" root="2.16.840.1.113883.3.6777.5. 2" assigningAuthorityName="NIHI"/>
4	name	1	As defined supra (name only)	<name>Hospital Laboratory</name>
4	telecom	1..*	As defined supra	<telecom value="tel:+3225258787" use="HP" />

L	Element/Path	C	Description	Use of attributes, recommended value / example
4	addr	1..*	As defined supra	<addr use="WP"> <country>BE</country> <city>ROUX</city><postalCode>60 44</postalCode><houseNumber>6 </houseNumber> <streetName>Rue du George</streetName> </addr>
3	/representedOrganization			</representedOrganization>
2	/assignedEntity			</assignedEntity>
1	/authenticator			</authenticator>
1	participant/	1	This element is used to model the time of the prescription. It follows the IHE Technical Laboratory Framework guidelines to model the prescribing party. As such, it must include the tags that follow.	CONSTANT: <participant typeCode="REF">
2	templateId	1	Ordering template	CONSTANT: <templateId root="1.3.6.1.4.1.19376.1.3.3.1.6"/>
2	time	1	Time of prescription	<time value="20080123211000.007- 0500"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
2	associatedEntity/	1	Actual entity that did prescription	CONSTANT:  <associatedEntity classCode="AGNT">
3	addr	1..*	Address of prescribing party. Information not obligatory here but tag must be present. Model address as supra.	<addr nullFlavor="NI"/>
3	telecom	1..*	Telecom of prescribing party. Information not obligatory here but tag must be present. Model information as supra.	<tel nullFlavor = "NI"/>
3	associatedPerson/	1	Name of prescribing party	<associatedPerson>
4	name	1	As defined supra (family and given name)  Tag should be present but allowed to be unknown here.	<name>  <family>Ney</family>  <given>Michel</given>  </name>
3	/associatedPerson	1		</associatedPerson>
2	/associatedEntity	1		</associatedEntity>
1	/participant	1		</participant>
1	inFulfillmentOf/	0..*	Tag containing the reference to the prescription.	<inFulfillmentOf>
2	order/	1		<order>
3	id	1	The actual reference to the original ordernumber.	<id extension="1234" root="TheNumberingSystem"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
2	/order			</order>
1	/inFulfillmentOf			</inFulfillmentOd>
1	documentationOf/	1..*	<p>This is used to identify the time when the report is created by the laboratory and includes element to support replace/final use cases</p> <p>Concerning its cardinality cfr. infra the &lt;code&gt; element.</p>	<documentationOf>
2	serviceEvent/	1		<serviceEvent>
3	code	0..1 or 1	<ul style="list-style-type: none"> <li>If 1 &lt;documentationOf&gt; element is used, it is implied it refers to all the acts in the CDA message. In this case it is <b>recommended</b> to clarify this fact by including the &lt;code&gt; element as such:  <code>&lt;code code="26436-6" codeSystem="2.16.840.1.113883.6. 1" codeSystemName="LOINC" displayName="LABORATORY STUDIES"/&gt;</code></li> <li>If N &lt;documentationOf&gt; elements are used, they <b>shall</b> each use &lt;code&gt; with the appropriate LOINC code of the laboratory specialty to which they refer.</li> </ul>	<code code="26436-6" codeSystem="2.16.840.1.113883.6. 1" codeSystemName="LOINC" displayName="LABORATORY STUDIES"/>

L	Element/Path	C	Description	Use of attributes, recommended value / example
3	lab:statusCode	0..1	The element lab:statusCode is optional but when it is there: this means this is a <b>non-final report and will be replaced in the future.</b> If the element lab:statusCode is not there, this means this is a <b>final report.</b> (But a replacement may still be sent in the future as a <b>correction to the final report!</b> ) The element lab:statusCode is an extension to the basic CDA.xsd <sup>15</sup>	CONSTANT: <lab:statusCode code="active"/>
3	effectiveTime/	1	The effectiveTime is the "time of the act": i.e. in this case: the act of creating the report, so this will be a moment in time (low value = high value.) The reason to express this in identical low and a high value is only because the CDA structure demands this.	<effectiveTime>
4	low	1	Value expressed in the format as described supra	<low value="20080104000000.0000-0500"/>
4	high	1	Value expressed in the format as described supra	<high value="20080104000000.0000-0500"/>
3	/effectiveTime			</effectiveTime>

<sup>15</sup> Please note, on the internet some XSD's circulate that show the <lab:statusCode> in a different incorrect position. The correct position of this element is just before <effectiveTime> as on this page.

L	Element/Path	C	Description	Use of attributes, recommended value / example
2	/serviceEvent			</serviceEvent>
1	/documentationOf			</documentationOf>
1	relatedDocument	0..1	If the document is a <b>new version</b> or a <b>correction</b> of a final report, this element must be included with a reference to the parentDocument id.  Note a replacement includes the same setId (cfr. supra) as the document that is being replaced but the versionNumber is incremented by 1.	CONSTANT:  <relatedDocument typeCode="RPLC">
2	parentDocument/	1		<parentDocument>
3	id	1	Reference to the document that is being replaced.	<id root="2.16.840.1.113883.3.6777.1. 1" extension="11530231003.2010081 40930000000"/>
2	/parentDocument			</parentDocument>
1	/relatedDocument			</relatedDocument>

## 6.5. CDA Body

### 6.5.1. Some elements explained

Please refer to the structured overview in this chapter for an overview of all minimally required elements in the Belgian laboratory message. This chapter focuses on some elements from the CDA schema that might benefit from some extra explanation.

**Although this chapter sometimes includes examples, please refer to the table infra for detailed sequenced descriptions of the used XML tags etc.**

#### 6.5.1.1. Codification of the observations

As in the KMEHR laboratory message: the recommended codification used is LOINC as per the subset defined by the FPS Health, for the majority of commonly used lab measurements and demands. This subset is available on the website of the FPS Health.

Dutch version:

[https://www.vas.ehealth.fgov.be/webretam/retam/home.htm?eventName=CHANGE\\_LANGUAGE&language=nl](https://www.vas.ehealth.fgov.be/webretam/retam/home.htm?eventName=CHANGE_LANGUAGE&language=nl)

French version:

[https://www.vas.ehealth.fgov.be/webretam/retam/home.htm?eventName=CHANGE\\_LANGUAGE&language=fr](https://www.vas.ehealth.fgov.be/webretam/retam/home.htm?eventName=CHANGE_LANGUAGE&language=fr)

It is allowed to use multiple codes. But the first code given must follow the following rules.  
(Other codes given will be for information purposes.)

- 1) The actual observation is preferably coded in LOINC (subset as defined by FPS Health)  
`<code code="718-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Hemoglobine"/>`
- 2) If above not possible , ALBERT codes are used (subset as defined by FPS Health)  
`<code code="XXX" codeSystem="2.16.840.1.113883.3.6777.12.1" codeSystemName="ALBERT" displayName="name of the code"/>`
- 3) If above not possible,laboratory sends its own code <sup>16</sup>  
plus  
obligatory a text element to further explain.  
`<code code="XXX" codeSystem ="0" codeSystemName="XXXXXX" displayName="name of the code">`  
`<originalText>further explanantion of the code<originalText></code>`

---

<sup>16</sup>Refer to Annex for some namings of custom codes

- 4) If above not possible the kind of observation is expressed only in text (allowed but not recommended)

```
<code nullFlavor="OTH" codeSystem="2.16.840.1.113883.6.1">
  <originalText>Very special observation</originalText>
</code>17
```

### **6.5.1.2. Expression of results**

#### **6.5.1.2.1. Units**

Typically, values will be expressed using a certain unit.

Units will be expressed using UCUM codes as per the specification on <http://unitsofmeasure.org/ucum.html>.

The KMEHR reference table CD-UNIT is not used.

```
<value xsi:type="PQ" value="11.7" unit="g/dL"/>
```

#### **6.5.1.2.2. Text format**

Normally, the result will be coded but there is also the need to express results in text.

This can be done with the value element using a string (ST type)

```
<value xsi:type="ST">Place here the result in a STRING format</value>
```

### **6.5.1.3. <structuredBody>**

On the level of the CDA header there will be 1 <component> element and within that <component> 1 <structuredBody>. The Laboratory message must not use the unstructured body element.

### **6.5.1.4. Act, observation and procedure in HL7**

In the naming of the different elements in the <entry> of the actual laboratory content, 'act', 'observation' and 'procedure' are all used.

This is a direct consequence of the way HL7 V3 is conceptually designed and what is inherited from previous incarnations of the standard. E.g. the collection of a specimen is a 'procedure' whereas the receiving of a specimen is an 'act.' What to use when is defined in the table infra.

### **6.5.1.5. Comment on any level of the <entry><sup>18</sup>**

The <entry> element may contain a comment on any level. This needs to follow a certain structure to comply with the IHE laboratory profiles.

---

<sup>17</sup> In this case, there is a reference to a OID but combined with a nullFlavor attribute 'OTH'. This is recommended by IHE guidelines.

<sup>18</sup> [LABTFV3] §1030

All this is fixed except the actual *reference* to the comment.

It is only a reference to the comment because the laboratory profile does not allow for the actual text string of the comment to be inserted here.

Please refer to the table infra where to use this structure.

```
<entryRelationship typeCode="COMP">
  <act classCode="ACT" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.40"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.2"/>
    <code code="48767-8" codeSystem="2.16.840.1.113883.6.1"codeSystemName="LOINC"
      displayName="Annotation Comment"/>
    <text><reference value='#Comment1' /></text>
    <statusCode code="available"/>
  </act>
</entryRelationship>
```

Note the actual content of the comment is listed in the `<text>` of the report item (i.e. on the same level as the `<entry>`) with its corresponding id.

Cfr. The structured overview infra for the exact place.

```
<text>
  <content ID="Comment1">The actual content of this comment.</content>
  [...]
</text>
```

#### **6.5.1.6. Entity in HL7**

Just as act, the elements in the CDA content also often refer to something being an ‘entity’. Again, this is a direct consequence of the way HL7 V3 is designed.

An ‘entity’ can take the shape of “living and non-living entities or things, subjects or targets of the act.” When to use what is defined in the table infra.

### 6.5.1.7. Reference values and severity

In a KMEHR structure, it is possible to define a minimum and a maximum reference value for something. This can be combined with one or more coded value to scope these reference values and an actual description of this scope.<sup>19</sup>

Related to this, there is also the possibility in KMEHR to define the severity of the finding in a coded structured way.<sup>20</sup>

E.g. It is possible to clarify something by giving a maximum and minimum value that is considered the reference value for a male that is between 20 and 40 years old. On top of that there is the possibility to add the value is e.g. 'normal.'

Refer to the KMEHR website for an example of this structure.<sup>21</sup>

In CDA, this is done by using the tag <interpretationCode> to categorize the severity of the finding. Refer to the Annex for the possible values of the 'interpretation Code' and the 'precondition criterion Code.'

```
<observation classCode="OBS" moodCode="EVN">  
    [...]  
    <code code="30341-2" codeSystem="2.16.840.1.113883.6.1"  
        codeSystemName="LOINC" displayName="Erythrocyte sedimentation rate"/>  
    [...]  
    <value xsi:type="PQ" value="2" unit="mm/h"/>  
<!-- typeCode="REFV" is a constant value, refers to reference values are coming -->  
    <referenceRange typeCode="REFV">  
        <!-- classCode="OBS" and moodCode="EVN.CRT" are constant  
            values, refer to criteria are coming for the event of the observation -->  
        <observationRange classCode="OBS" moodCode="EVN.CRT">  
            <!--use IVL_PQ if the reference is a physical quantity interval-->  
            <value xsi:type="IVL_PQ">  
                <low value="0" unit="mm/h"/>  
                <high value="30" unit="mm/h"/>  
            </value>
```

---

<sup>19</sup> This is the reference table CD-REFSCOPE in KMEHR. It contains values e.g. for age: to define the normal values given are adjusted to the age of the patient.

<sup>20</sup> This is the reference table CD-SEVERITY in KMEHR. This contains values like 'normal', 'low', 'susceptible', ...

<sup>21</sup> <https://www.ehealth.fgov.be/standards/kmehr/en/transactions/laboratory-result>

<!-- If the reference is not an interval but one actual physical quantity value, the following can be used:-->

```
<value xsi:type="PQ" unit="mm/h" value="20"/>
    <!-- interpretationCode to mark these as normal -->
    <interpretationCode code="N"/>
    <!--optionally also include a precondition for the interpretation-->
    <lab:preconditiontypeCode="PRCN">
        <!-- constant tag: what follows is a condition -->
        <criterion classCode="COND" moodCode="EVN">
            <!-- what kind of condition: code+value (refer to Annex)-->
            <code code="SEX"/>
            <value xsi:type="CD"
code="M"codeSystem="2.16.840.1.113883.5.1"/>
        </criterion>
    </lab:precondition>
</observationRange>
</referenceRange>
</observation>
```

#### ***6.5.1.7.1. Reference values in text***

If needed, the reference values can be expressed in text. When characters like '<' are used, escape characters will be needed in the XML message.

Please note the <value> still needs to be given, this can be done as in this example:

```
<referenceRange typeCode="REFV">
    <observationRange classCode="OBS" moodCode="EVN.CRT">
        <text>Between 3.93 and 5.01 (10*6/uL)</text>
        <value nullFlavor="OTH"/>
        <interpretationCode code="N"/>
    </observationRange>
</referenceRange>
```

### 6.5.2. Structured overview

The CDA message contains one or more 'laboratory specialty' parts.

Every laboratory specialty part has 1 'report item' part. The report item contains 1 'specimen act' part.

The 'specimen act' contains zero or more specimens – each specimen has a unique id within the XML message.

The 'specimen act' also contains 1 or more observations, if the specimens are defined, they refer to a specific specimen id.

This means the high level structure of the content of the message will look like this (note this skeleton structure only shows some of the key elements, please refer to the table infra for a complete structure):<sup>22</sup>

[CDA]

1 [CODE] (LOINC code to define the report cfr. Note 4.1 infra)

0...1[TITLE] (optional title in free text)

1 [COMPONENT/STRUCTUREDBODY/]

1...\* [COMPONENT/SECTION/] (the laboratory specialty section part)

1[CODE] (LOINC code to define the laboratory specialty cfr. Note 4.2 infra)

0..1[TITLE] (optional title in free text)

1...\* [COMPONENT/SECTION/] (the report item part: zero or more specimen with 1 or more observations)

1[CODE] (A first coded title to define this report item cfr. Note 4.3 infra)

1[ENTRY/ACT/] (the specimen act part)

1[CODE] (A second coded title to define this report item cfr. Note 4.3 infra)

---

<sup>22</sup>[LABTF3]This skeleton structure follows what is proposed in the IHE Laboratory Technical Framework

0..\* [ENTRYRELATIONSHIP] (defining a specimen)  
1...\*[ENTRYRELATIONSHIP] (defining an observation)  
0...\*[ENTRYRELATIONSHIP/] (defining a subtitle comment cfr. Note 4.4 infra)  
    1[ACT] (subtitle comment act)  
        1...\*[ENTRYRELATIONSHIP] (defining an observation)  
        0...\*[ENTRYRELATIONSHIP] (defining a subtitle comment)

Notes:

1. Challenge studies and microbiology results follow a slightly different structure using the element <organizer> to group observations (cfr. Infra specific use cases)
2. All the specimen must be defined at the highest level, also the derived specimenThe observations must clearly state to which specimen they refer using the unique id of the specimen.
3. If the sending laboratory sends titles: these should be included in the message and the presentation should follow the sequence of the XML message. Sampletypes may be optionally repeated within an observation to ensure a good presentation.
4. Note the CDA demands coded titles on different levels:
  - 4.1. In the header there is a general title for the report expressed in LOINC. This is from the list in Annex. If the report contains multiple specialties this will be the generic 26436-6 LABORATORY STUDIES.
  - 4.2. In the structured body there is a LOINC coded title for each specialty. E.g. 18723-7 HEMATOLOGY STUDIES. This is also from the list in Annex. If the report contains one specialty, this will be the same as in 4.1
  - 4.3. Each report item demands 2 coded titles: 1code (LOINC or other) on the level of section and 1 (LOINC or other) on the level of act. In the structure described here normally these two are the same. E.g. 16931-8 Hemoglobin/Hematocrit.  
(The IHE laboratory profile does not permit the use of nullFlavor here: use <code code="118246004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="laboratory observations"/> if there is no further detail needed on these levels.)
  - 4.4. If there is still a need to define a hierarchy with subtitles *within a report item*, optionally an EntryRelationship with a subtitle comment can be inserted. E.g. 'Screening'.

L= Level, C = Cardinality.

Rows with a grey background indicate an opening or closing to a different level.

'...../' in the second column indicates the opening of an XML tag.

'/.....' In the second column indicates a closing of an XML tag.

L	Element/Path	C	Description	Recommended value / example
1	component/	1	Fixed.  The high level <component> in the header to hold the structured body.	CONSTANT:  <component typeCode= "COMP">
2	structuredBody/	1	Fixed.  What follows is a structured body of content and the actual laboratory reporting.	CONSTANT:  <structuredBody classCode ="DOCBODY" moodCode ="EVN">
3	component/	1...*	Fixed.  This second <component> holds the specialty section. If the CDA contains more specialty sections, each one is a new component on this level.	CONSTANT:  <component typeCode= "COMP">
4	section/	1		CONSTANT:  <section classCode="DOCSECT">
5	templateId	1	The section contains a reference to a HL7 OID that simply refers to the fact this a 'Laboratory Specialty Section'	CONSTANT:  <templateId root="1.3.6.1.4.1.19376.1.3.3.2.1"/>

L	Element/Path	C	Description	Recommended value / example
5	code	1	The subject of this specialty, expressed in a LOINC code.  Cfr. Annex for allowed codes (CDA Laboratory Specialty codes)	<code code="18723-7" codeSystem="2.16.840.1.113883.6.1 " codeSystemName="LOINC" displayName="HEMATOLOGY STUDIES"/>
5	title	0..1	The subject of this specialty, expressed in free text: if used in combination with a code, this must be logically following from the LOINC code in the element supra.	<title>HEMATOLOGY STUDIES</title>
5	component/	1..*	The actual laboratory report item.	<component>
6	section/	1		<section>
7	templateId	1	To identify this as a report item	<templateId root="1.3.6.1.4.1.19376.1.3.3.2.2"/>
7	code	1	A code to identify this report item. (i.e. first title of this report item)	<code code="118246004" codeSystem="2.16.840.1.113883.6.9 6" codeSystemName="SNOMED-CT" displayName="laboratory observations"/>
7	text/	1	To hold any textual comments within this entire report item.	<text>

L	Element/Path	C	Description	Recommended value / example
8	content	1..*	If there are any textual comments in this report item, they are listed here with a unique ID in this message.	<content ID="Subtitle1">Screening</content> if there are no textual comments in this report item, use: <content/>
7	/text			</text>
7	entry/	1	Tag to define this item as an 'entry' and hold everything together.	CONSTANT: <entry typeCode="DRIV">
8	templateId	1	Mandatory and fixed. Identifies this entry as a Laboratory Report Data - Processing Entry	CONSTANT: <templateId root="1.3.6.1.4.1.19376.1.3.1"/>
8	act/	1	Start of the 'specimen act' (the IHE laboratory way of combining specimen with observations) <sup>23</sup>	CONSTANT: <act classCode="ACT" moodCode="EVN">
9	code	1	A code in a system to give a second title to this report item.	<code code="118246004" codeSystem="2.16.840.1.113883.6.9 6" codeSystemName="SNOMED-CT" displayName="laboratory observations"/>

<sup>23</sup>[LABTF3] §875

L	Element/Path	C	Description	Recommended value / example
9	statusCode	1	<p>Status of this report item. Must not conflict with the statuscodes of the observations in this item. Note this is the status of this reportItem <b>as considered by IHE template guidelines</b>. This statusCode should be given as 'active' when this reportitem is not yet finished and as 'completed' when all results are in.</p> <p><b><u>The actual Belgian statusCode is given using an entryRelationship element within the act (cfr. next item)</u></b></p>	<statusCode code="completed"/>
9	entryRelationship	1	<p>The actual Belgian statusCode of the report item. Use this model and use as value one of the values in Annex.</p> <pre>&lt;entryRelationship typeCode ="COMP"&gt; &lt;observation classCode="OBS" moodCode="EVN"&gt; &lt;templateId root="2.16.840.1.113883.3.6777.10.1" /&gt; &lt;code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/&gt; &lt;value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode" displayName="available" /&gt; &lt;/observation&gt; &lt;/entryRelationship&gt;</pre>	
9	entryRelationship/	0...*	<p>This is the tag containing the information about the specimen: a COMPOnent expressed as 'entryRelationship' element. (i.e. there is a connection to other tags)</p>	<p>CONSTANT:</p> <pre>&lt;entryRelationship typeCode="COMP"&gt;</pre>

L	Element/Path	C	Description	Recommended value / example
10	procedure/	1	The collection of a specimen is modelled using the element procedure. This element is at least needed once in the message to define the time of collection of the specimen. (But this time is allowed to be unknown.)	CONSTANT: <pre>&lt;procedure classCode="PROC" moodCode="EVN"&gt;</pre>
11	templateId	1	A reference to the template to identify this as a HL7 Specimen collection	CONSTANT: <pre>&lt;templateId root="1.3.6.1.4.1.19376.1.3.1.2"/&gt;</pre>
11	code	1	The LOINC code to describe the date of the collection of the specimen.	CONSTANT: <pre>&lt;code code="33882-2" codeSystem="2.16.840.1.113883.6.1 " displayName="Specimen Collection"/&gt;</pre>
11	effectiveTime	1	The date/time of collection of the specimen	<effectiveTime value="20140412"/> if not known, use: <pre>&lt;effectiveTime nullFlavor="UNK"/&gt;</pre>

L	Element/Path	C	Description	Recommended value / example
11	targetSiteCode	0...1	<p>The site can be optionally included in the observation and/or the specimen using this element.</p> <p>Preferably, this will be a SNOMED-CT code. Alternatively, a proprietary code or eventually text (targetSiteCode/originalText) can be used to express this.</p> <p>If a proprietary code is used: there must also be an explanation using targetSiteCode/originalText.</p>	<targetSiteCode code="73416001" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="collection of clean catch urine specimen"/>

L	Element/Path	C	Description	Recommended value / example
11	participant/	1	<p>To define the actual specimen.</p> <p>The specimen is functionally considered to be a participant in this collection of itself.</p> <p>In the event no information needs or can be given here, a nullFlavor model may be used as follows to define the specimen:</p> <pre>&lt;participant typeCode="PRD" nullFlavor="NI"&gt;      &lt;participantRole classCode="SPEC"&gt;         &lt;id nullFlavor="NI"/&gt;         &lt;playingEntity nullFlavor="NI"/&gt;     &lt;/participantRole&gt; &lt;/participant&gt;</pre>	<participant typeCode="PRD">
12	participantRole/	1	The specimen plays the role of 'specimen' in this collection	<participantRole classCode="SPEC">
13	id	1	<p>If the laboratory report item contains multiple specimen, use a unique id (unique in the message) to identify this specimen. Put this id in the extension attribute of the element.</p> <p>In the root attribute, give the name of the numbering system.</p>	<id extension ="1" root="OurLABNumbering System"/>

L	Element/Path	C	Description	Recommended value / example
13	playingEntity/	1	The specimen is an entity	<playingEntity classCode="ENT">
14	code	1	<p>The actual specimen, described using a coding system.</p> <p>(In the example, the coding system SNOMED-CT is used for this. This coding system is named and is referred by its OID)</p>	<code code="119297000" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Blood"/>  if not specified:  <code code="397212007" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Specimen type not specified"/>
13	/playingEntity			</playingEntity>
12	/participantRole			</participantRole>
11	/participant			</participant>
11	entryRelationship/	1	This element contains the 'act of receiving the specimen'. It is a COMPOnent that has a relation with the above 'specimen playing the role of participant.'	<entryRelationship typeCode="COMP">
12	act/	1	Act is used to define the time when the specimen is received. This time must be given although it is allowed to be unknown.	CONSTANT: <act classCode="ACT" moodCode="EVN">

L	Element/Path	C	Description	Recommended value / example
13	template	1	Template of receiving specimen	CONSTANT: <code>&lt;templateId root="1.3.6.1.4.1.19376.1.3.1.3"/&gt;</code>
13	code	1	IHE code of receiving specimen	CONSTANT: <code>&lt;code code="SPRECEIVE" codeSystem="1.3.5.1.4.1.19376.1.5. 3.2" codeSystemName="IHEActCode"/&gt;</code>
13	statusCode	0..1	The status of the specimen.  Use a value from the table in Annex.	<code>&lt;statusCode code="initial"/&gt;</code>
13	effectiveTime	1	Time of receiving the specimen	<code>&lt;effectiveTime value="20140412"/&gt;</code> if not known, use: <code>&lt;effectiveTime nullFlavor="UNK"/&gt;</code>
13	entryRelationship	0..1	Optional text element to give an extra comment. (E.g. about the status of the specimen)	Use the structure described in "6.5.1.5 Comment on any level of the <entry>"
12	/act			<code>&lt;/act&gt;</code>
11	/entryRelationship			<code>&lt;/entryRelationship&gt;</code>
10	/procedure			<code>&lt;/procedure&gt;</code>
9	/entryRelationship			<code>&lt;/entryRelationship&gt;</code>

L	Element/Path	C	Description	Recommended value / example
9	entryRelationship/	1...*	The tag that holds the observation. A COMPOnent that forms a relationship with the other entryRelationship elements supra.	<entryRelationship typeCode="COMP">
	organizer	0..1	NB. Here is the possibility to diverge slightly from the structure that follows in this table: use an <organizer> element here to model dynamic/challenge testing.  Instead of a list of entryRelationship/observation as written in this table infra, this will create a list of component/observation.  Cfr. the next chapter in this document for a detailed description how this looks.	
10	observation/	1		<observation classCode="OBS" moodCode="EVN">
11	templateId	1	Reference to the observation template	<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
11	id	0..1	Id of this specific observation  (Typically use nullFlavor if no specific id is provided – otherwise use root and/or extension attributes as supra)	<id nullFlavor="NI"/>
11	code/	1	The LOINC code from the Belgian subset as defined by the FPS Health to indicate what is being tested. (If not possible to use a LOINC code and/or to extend the code tag from that subset with an optional text tag: follow strictly the hierarchy as described supra: "6.5.1.1 Codification of the observations" )	<code code="20563-3" codeSystem="2.16.840.1.113883.6.1 " codeSystemName="LOINC" displayName="Hemoglobin">

L	Element/Path	C	Description	Recommended value / example
12	translation/	0..*	Number of equivalent codes. Used when there is the need to send multiple codes meaning the same thing.  (follow strictly the rule as described supra: "6.5.1.1 Codification of the observations")	<translation code="24QZA" codeSystemName="The QZA Naming System" displayName="Hemogl.">
13	originalText	0..1	Text explaining the code  (follow strictly the rule as described supra: "6.5.1.1 Codification of the observations")	<originalText>Hemoglobin</originalText>
12	/translation			</translation>
11	/code			</code>
11	statusCode	1	The status of the observation as considered by IHE template guidelines: “completed” when the result is present, ‘aborted’ if the test could not be performed.” <sup>24</sup>  <u><b>The actual Belgian statusCode is given with an entryRelationship element within the observation (cfr. infra)</b></u>	<statusCode code="completed"/>
11	effectiveTime	0..1	Within the observation, there can be an <effectiveTime> of observation. When this is used; this is the availability of the result.	<effectiveTime value="20140412"/>

<sup>24</sup> The guidelines only allow these 2 values [LABTFV3] §1005

L	Element/Path	C	Description	Recommended value / example
11	value	0..1	<p>Value expressed in UCUM. According to the description in "6.5.1.2 Expression of results"</p> <p>This is absent in case of an obsolete or aborted observation or if a multimedia attachment is used to express the results. ("6.6.2 Embedding multimedia content")</p>	<pre>&lt;value xsi:type="PQ" value="3.91" unit="10E6/µL"/&gt;</pre> <p>or when expressed in text:</p> <pre>&lt;value xsi:type="ST"&gt;Place here the result in a STRING format&lt;/value&gt;</pre>
11	interpretationCode	0..1	The interpretationCode using a value from the HL7 table for this (cfr Annex)	<interpretationCode code="N"/>
11	methodCode	0..1	The methodCode element may be used to record the specific method used to make an observation when this information is not already logically within the observation code.	
11	targetSiteCode	0...1	<p>The site can be optionally included in the observation and/or the specimen using this element.</p> <p>Preferably, this will be a SNOMED-CT code. Alternatively, a proprietary code or eventually text (targetSiteCode/originalText) can be used to express this.</p> <p>If a proprietary code is used: there must also be an explanation using targetSiteCode/originalText.</p>	<pre>&lt;targetSiteCode code="XXXX" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="XXXX"/&gt;</pre>

L	Element/Path	C	Description	Recommended value / example
11	specimen/	0..*	If needed – a reference to the specimen id	<specimen typeCode="SPC">
12	specimenRole/	1		CONSTANT: <specimenRole classCode="SPEC">
13	id	1	The actual reference this refers to a value that was defined at the level of the specimen in participantRole/id.	<id extension ="1" root="OurLABNumbering System"/>
12	/specimenRole			</specimenRole>
11	/specimen			</specimen>
11	performer/	0..1	In the case of subcontracted to an external laboratory, this external laboratory (with its address and telcom) and the actual performer is represented by a <performer> element, whereas the Director of this subcontractor laboratory is carried by the <participant> element being attached to the same level as the <performer> element. (cfr.infra)	<performer typeCode="PRF">
12	templateId	1	Reference to the performer template ID	CONSTANT: <templateId root="1.3.6.1.4.1.19376.1.3.3.1.7"/>
12	assignedEntity	1	Cfr. supra (in Header section)	
11	/performer			</performer>

L	Element/Path	C	Description	Recommended value / example
11	participant/	0..1	In the case of subcontracted to an external laboratory, the external laboratory (with its address and telcom) and the actual performer is represented by a <performer> element (cfr. supra), whereas the Director of this subcontractor laboratory is carried by the <participant> element being attached to the same level as the <performer> element.	<participant typeCode="RESP">
12	participantRole/	1		<participantRole>
13	playingEntity/	1		<playingEntity>
14	name/	1		<name>
15	family	1		<family>Pulasky</family>
15	given	1		<given>Katherine</given>
14	/name			</name>
13	/playingEntity			</playingEntity>
12	/participantRole			</participantRole>
11	/participant			</performer>

L	Element/Path	C	Description	Recommended value / example
11	entryRelationship	1	<p>The actual Belgian statusCode of the observation. Use this model and use as value one of the values in Annex.</p> <pre>&lt;entryRelationship typeCode ="COMP"&gt; &lt;observation classCode="OBS" moodCode="EVN"&gt; &lt;templateId root="2.16.840.1.113883.3.6777.10.1" /&gt; &lt;code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/&gt; &lt;value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode" displayName="available" /&gt; &lt;/observation&gt; &lt;/entryRelationship&gt;</pre>	
11	entryRelationship	0..1	<p>NB. Here is the possibility to use an &lt;entryRelationship&gt; element to embedd multimedia content.</p> <p>Cfr. the next chapter in this document for a detailed description how this looks.</p>	
11	referenceRange/	0..1	If needed, there is the option to give reference ranges for this value.	<p>CONSTANT:</p> <pre>&lt;referenceRange typeCode="REFV"&gt;</pre>
12	observationRange/	1	The range observed in this reference range. (The EVN.CRT refers to it being a criterion for the event of the observation )	<p>CONSTANT:</p> <pre>&lt;observationRange classCode="OBS" moodCode="EVN.CRT"&gt;</pre>
13	value/	1	To identify the value of the range. (e.g. IVL_PQ: an interval of Physical Qualities.)	<pre>&lt;value xsi:type="IVL_PQ"&gt;</pre>
14	low	1	The low value, expressed in UCUM	<pre>&lt;low value="3.93" unit="10E6/µL"/&gt;</pre>
14	high	1	The high value, expressed in UCUM	<pre>&lt;high value="5.01" unit="10E6/µL"/&gt;</pre>
13	/value			<pre>&lt;/value&gt;</pre>

L	Element/Path	C	Description	Recommended value / example
13	interpretationCode	1	The interpretationCode using a value from the HL7 table for this (cfr Annex)	<interpretationCode code="N"/>
13	lab :precondition/	0..1	A precondition for this reference range	CONSTANT <lab:precondition typeCode="PRCN">
14	criterion/	1	If needed to specify for the reference range, there is the option to clarify using criterion	CONSTANT <criterion classCode="COND" typeCode="EVN">
15	code	1	Code of the criterion (cfr. Annex)	<code code="SEX"/>
15	value	1	Value of the criterion, expressed in, a coded system.(If this is necessary – in case the criterion would be age: this would be a value or a value with <high> and <low > )	<value xsi:type="CD" code="M" codeSystem="2.16.840.1.113883.5.1 "/>
14	/criterion			</criterion>
13	/lab :precondition			</lab: precondition>
12	/observationRange			</observationRange>
11	/referenceRange			</referenceRange>
10	/observation			</observation>
9	/entryRelationship			</entryRelationship>
8	/act			</act>
7	/entry			</entry>

L	Element/Path	C	Description	Recommended value / example
6	/section			</section>
5	/component			</component>
4	/section			</section>
3	/component			</component>
2	/structuredBody			</structuredBody>
1	/component			</component>

## 6.6. Specific use cases of the CDA message

### 6.6.1. Dynamic testing / challenge studies

When the observation contains dynamic testing: the multiple observations are grouped together by an<organizer> element like this:

L	Element/Path	Description	Use of attributes, recommended value / example
	<entryRelationship/>	The component that holds the organizer element.	CONSTANT: <EntryRelationship typeCode="COMP">
+1	<organizer/>	The container for the different tests in the challenge.	CONSTANT: <organizer classCode="BATTERY" moodCode="EVN">
+2	templateId	Battery template	CONSTANT: <templateId root="1.3.6.1.4.1.19376.1.3.1.4"/>

All the observations are then separate <component>/<observation> elements within that<organizer> element.

Example dynamic test (cfr. Following paragraphs for detailed explanations of the <qualifier> element)

```

<entryRelationship typeCode="COMP">
  <organizer classCode="BATTERY" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.3.1.4"/>
  <!--A LOINC code describing the kind of panel may be optionally given-->

```

```
<code code="XXXXXXX" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="XXXXXXXXXX"/>
<statusCode code="completed"/>
<component>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.3.6777.10.1">
      <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/>
      <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode"
displayName="available"/>
    </observation>
  </component>
  <!-- within the organizer element, every observation of the curve is 1 component/observation -->
  <component typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
      <id nullFlavor="NI"/>
      <code code="16904-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="GLUCOSE^1ST SPECIMEN
POST XXX CHALLENGE">
        <qualifier>
          <name code="LP21276-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="relative time"/>
          <value xsi:type="PQR" value="50" code="min" codeSystem="2.16.840.1.113883.6.8" codeSystemName="UCUM - Unified Code for
Units of Measure"/>
        </qualifier>
      </code>
      <statusCode code="completed"/>
      <effectiveTime value="201511041138"/>
      <value xsi:type="PQ" value="2" unit="mm/h"/>
    <entryRelationship typeCode="COMP"><!-- actual Belgian statusCode -->
```

```
<observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.3.6777.10.1"/>
    <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
    <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
</entryRelationship>
</observation>
</component>
<component>
    [next observation]
</component>
</organizer>
</entryRelationship>
```

### **6.6.1.1. LOINC XXX time codes**

LOINC codes exist that define a specific timing interval as 'XXX'. E.g. "LOINC 16904-5 GLUCOSE^1ST SPECIMEN POST XXX CHALLENGE" but without a timing interval.

If the Code needs to be extended with a relative time or a point in time: use a <qualifier> element to extend the code as in the example supra and further explained infra.

#### **6.6.1.1.1. Relative time**

<qualifier>

```
<name code="LP21276-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"  
displayName="relative time"/>
```

```
<value xsi:type="PQR" value="50" code="min" codeSystem="2.16.840.1.113883.6.8"  
codeSystemName="UCUM - Unified Code for Units of Measure"/>
```

/qualifier>

Note: The 'xsi:type="PQR"' always needs to be given because it determines this as a "physical quantity representation" and allows the use of an attribute 'value' and an attribute 'code.'

In <value>, the attribute 'value' contains the actual time and the attribute 'code' is the UCUM time unit (s/min/h)

#### **6.6.1.1.2. Point in time**

<qualifier>

```
<name code="LP6960-1" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"  
displayName="point in time"/>
```

```
<value xsi:type="PQR" value="20161404050000"/>
```

/qualifier>

Note the value contains in attribute value the actual time.

### **6.6.2. Embedding multimedia content**

The IHE laboratory framework explicitly allows for multimedia embedded content using the <ObservationMedia> element.

This element behaves otherwise similarly and is placed in the <observation> structure. The <code> that is used in the <observation> may eventually have nullFlavor because everything will be in the embedded element. However, if it is possible to use a code to describe what is in the content, that is strongly recommended.

Cfr. the example in "6.6.4.3. Example antibiogram as text blob."

Note the actual content is base64 encoded.

```
<entryRelationship typeCode="COMP">
<observationMedia classCode="OBS" moodCode="EVN" ID="ELECTRO">
    <value
        mediaType="image/gif" representation="B64">SGVsbG8gZUhlYWx0aCB1c2VyIQ==
    </value>
</observationMedia>
</entryRelationship>
```

### **6.6.3. Referral**

When a laboratory sends a result that includes results from referral parties. It simply must be made clear in the report that an observation was obtained via referral.

This can be done by using the annotation structure as explained in "6.5.1.5 Comment on any level of the <entry>."

### **6.6.4. Microbiology**

In antibiogram, everything is organized in 1 big <organizer> 'cluster' element like this:

```
<entryRelationship typeCode="COMP">
    <organizer classCode="CLUSTER" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.5"/>
```

Within that <organizer> element:

- The micro organism is defined as a separate <specimen> element, this is preferably expressed in SNOMED-CT.
- A <component> with an <organizer> element to model e.g Bacterial susceptibility panel (e.g. example infra)
- Other <component> with e.g. <observation>

Interpretation codes are given like this:

```
<interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
```

In case of a antimicrobial susceptibility test in microbiology, the vocabulary domain is ObservationInterpretationSusceptibility:<sup>25</sup>

- S = susceptible

---

<sup>25</sup>taken from [LABTFV3] § 1005

- R = resistant
- I = intermediate
- DDS = dose dependent susceptibility.

Please note although it is not explicitly mentioned in the examples supra, an antibiogram may also contain actual values in the observations. These follow the same structure as in "6.5.2 Structured overview."

The examples supra make the assumption every column contains all the tests.

#### 6.6.4.1. Example antibiogram with 2 micro organisms.

Example below based on this antibiogram:

---

Specimen specification	Throat swab	
Culture	1. Morganella morganii	
	2. Escherichia coli	
Antibiogram	1	2
Ampicillin	R	S
Trimethoprim+Sulfamethoxazole	S	S
Nitrofurantoin	R	S
Cefuroxime	R	S
Gentamicin	S	S
Colistin	R	S
Temocillin	S	S
Fosfomycin	S	S
Levofloxacin	S	S
Ofloxacin	S	S
Amoxicillin+Clavulanate	R	S
Amikacin	S	S
Piperacillin+Tazobactam	S	S
Ceftriaxone	S	S

---

	Cefotaxime	S	S
	Ceftazidime	S	S
	Meropenem	S	S
MRSA	Negative		
MRGN	Negative		

---

```

<structuredBody classCode="DOCBODY" moodCode="EVN">
  <component typeCode="COMP">
    <section classCode="DOCSECT">
      <templateId root="1.3.6.1.4.1.19376.1.3.3.2.1"/>
      <!-- section 1st level (the speciality section): the speciality title in LOINC-->
      <code code="18769-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="MICROBIAL SUSCEPTIBILITY TESTS"/>
      <component typeCode="COMP">
        <section>
          <!-- section 2nd level( the report item section): title in LOINC or other -->
          <templateId root="1.3.6.1.4.1.19376.1.3.3.2.2"/>
          <code code="118246004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="laboratory observations"/>
          <text>
            <content/>
          </text>
          <entry typeCode="DRIV">
            <!--entry ALWAYS has ONE <act>: the specimen act -->
            <!--Template Id : Mandatory and fixed. Identifies this entry as a Laboratory Report Data - Processing Entry.-->
            <templateId root="1.3.6.1.4.1.19376.1.3.1"/>
            <!-- here begins what we call the 'specimen act' -->
            <act classCode="ACT" moodCode="EVN">
              <code code="118246004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="laboratory
observations"/>
              <statusCode code="completed"/>
              <entryRelationship typeCode="COMP">
                <observation classCode="OBS" moodCode="EVN">
                  <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                  <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/>
                  <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode"
displayName="available"/>
                </observation>
              </entryRelationship>
              <entryRelationship typeCode="COMP">
                <procedure classCode="PROC" moodCode="EVN">
                  <templateId root="1.3.6.1.4.1.19376.1.3.1.2"/>
                  <code code="33882-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Specimen Collection">

```

```
</code>
<!--time of specimen collection -->
<effectiveTime value="20150201"/>
<!--if needed insert a targetSiteCode element here with SNOMED-CT code defining the site -->
<participant typeCode="PRD">
    <participantRole classCode="SPEC">
        <id extension="1" root="NumberingSystem"/>
        <playingEntity classCode="ENT">
            <code code="258529004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Throat
swab"/>
            </playingEntity>
        </participantRole>
    </participant>
    <entryRelationship typeCode="COMP">
        <act classCode="ACT" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.3.1.3"/>
            <!--time of receiving specimen -->
            <code code="SPRECEIVE" codeSystem="1.3.5.1.4.1.19376.1.5.3.2" codeSystemName="IHEActCode"/>
            <effectiveTime value="20150202"/>
        </act>
    </entryRelationship>
    </procedure>
</entryRelationship>
    <entryRelationship typeCode="COMP">
        <!-- 1 organizer CLUSTER binds the Micro organism with 1 organizer BATTERY containing the antibiogram -->
        <organizer classCode="CLUSTER" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.3.1.5"/>
            <statusCode code="completed"/>
            <effectiveTime value="20150202230000.0000-0500"/>
            <specimen typeCode="SPC">
                <specimenRole classCode="SPEC">
                    <specimenPlayingEntity classCode="MIC">
                        <!-- specimen role MIC (micro organism) -->
                        <code code="243301005" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Morganella morganii"/>
                        <!-- micro organism preferably expressed in SNOMED-CT -->
                    </specimenPlayingEntity>
                </specimenRole>
            </specimen>
            <component typeCode="COMP">
                <organizer classCode="BATTERY" moodCode="EVN">
                    <templateId root="1.3.6.1.4.1.19376.1.3.1.4"/>
                    <code code="29576-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Bacterial
susceptibility panel"/>
                    <statusCode code="completed"/>
                    <component typeCode="COMP">
                        <observation classCode="OBS" moodCode="EVN">
                            <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
```

```
<code code="29-9" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Ampicillin"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT">
displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2">
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
</entryRelationship>
</observation>
</component>
<component typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="516-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC">
displayName="Trimethoprim+Sulfamethoxazole"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT">
displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2">
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
</entryRelationship>
</observation>
</component>
<component typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="363-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC">
displayName="Nitrofurantoin"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
```

```
        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
            <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                </observation>
            </entryRelationship>
        </observation>
    </component>
    <component typeCode="COMP">
        <observation classCode="OBS" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
            <code code="51774-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Cefuroxime"/>
            <statusCode code="completed"/>
            <effectiveTime value="20150202230000.0000-0500"/>
            <interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
            <entryRelationship typeCode="COMP">
                <observation classCode="OBS" moodCode="EVN">
                    <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                    <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                    <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                        </observation>
                    </entryRelationship>
                </observation>
            </component>
            <component typeCode="COMP">
                <observation classCode="OBS" moodCode="EVN">
                    <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
                    <code code="267-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Gentamicin"/>
                    <statusCode code="completed"/>
                    <effectiveTime value="20150202230000.0000-0500"/>
                    <interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
                    <entryRelationship typeCode="COMP">
                        <observation classCode="OBS" moodCode="EVN">
                            <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                            <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                            <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                                </observation>
                            </entryRelationship>
                        </observation>
                    </component>
                    <component typeCode="COMP">
                        <observation classCode="OBS" moodCode="EVN">
```

```
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="205-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Colistin"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT">
displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2">
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
</entryRelationship>
</observation>
</component>
<component typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="492-9" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Temocillin"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT">
displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2">
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
</entryRelationship>
</observation>
</component>
<component typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="25653-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Fosfomycin"/>
<statusCode code="completed"/>
<effectiveTime value="20150202230000.0000-0500"/>
<interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219">
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
```

```
        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
            <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                </observation>
            </entryRelationship>
        </observation>
    </component>
    <component typeCode="COMP">
        <observation classCode="OBS" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
            <code code="20396-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Levofloxacin"/>
                <statusCode code="completed"/>
                <effectiveTime value="20150202230000.0000-0500"/>
                <interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
                    <entryRelationship typeCode="COMP">
                        <observation classCode="OBS" moodCode="EVN">
                            <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                            <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                                    </observation>
                                </entryRelationship>
                            </observation>
                        </component>
                        <component typeCode="COMP">
                            <observation classCode="OBS" moodCode="EVN">
                                <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
                                <code code="375-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Ofloxacin"/>
                                <statusCode code="completed"/>
                                <effectiveTime value="20150202230000.0000-0500"/>
                                <interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
                                    <entryRelationship typeCode="COMP">
                                        <observation classCode="OBS" moodCode="EVN">
                                            <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                                            <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                                                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available">
                                                    </observation>
                                                </entryRelationship>
                                            </observation>
                                        </component>
                                        <component typeCode="COMP">
```

```
<observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
    <code code="20-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Amoxicillin+Clavulanate"/>
    <statusCode code="completed"/>
    <effectiveTime value="20150202230000.0000-0500"/>
    <interpretationCode code="R" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
    <entryRelationship typeCode="COMP">
        <observation classCode="OBS" moodCode="EVN">
            <templateId root="2.16.840.1.113883.3.6777.10.1"/>
            <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
                    </observation>
                </entryRelationship>
            </observation>
        </component>
        <component typeCode="COMP">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
                <code code="12-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Amikacin"/>
                <statusCode code="completed"/>
                <effectiveTime value="20150202230000.0000-0500"/>
                <interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
                <entryRelationship typeCode="COMP">
                    <observation classCode="OBS" moodCode="EVN">
                        <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                            <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
                                </observation>
                            </entryRelationship>
                        </observation>
                    </component>
                    <component typeCode="COMP">
                        <observation classCode="OBS" moodCode="EVN">
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displayName="Piperacillin+Tazobactam"/>
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displayName="Availability of"/>
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        </organizer>
    </entryRelationship>
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        <code code="112283007" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Escherichia coli"/>
            <!-- micro organism preferably expressed in SNOMED-CT -->
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            </specimenRole>
        </specimen>
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susceptibility panel"/>
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<component typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
<code code="6652-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Meropenem"/>
<statusCode code="completed"/>
<interpretationCode code="S" codeSystem="2.16.840.1.113883.1.11.10219"
codeSystemName="ObservationInterpretationSusceptibility"/>
<entryRelationship typeCode="COMP">
<observation classCode="OBS" moodCode="EVN">
<templateId root="2.16.840.1.113883.3.6777.10.1"/>
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
</observation>
```

```
                </entryRelationship>
            </observation>
        </component>
    </organizer>
</component>
</organizer>
</entryRelationship>
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
        <code code="35492-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="MRSA"/>
        <statusCode code="completed"/>
        <effectiveTime value="20150202230000.0000-0500"/>
        <value xsi:type="ST">negative</value>
        <entryRelationship typeCode="COMP">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability
of"/>
                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
            </observation>
        </entryRelationship>
    </observation>
</entryRelationship>
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
        <code code="78702-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="MRGN"/>
        <statusCode code="completed"/>
        <effectiveTime value="20150202230000.0000-0500"/>
        <value xsi:type="ST">negative</value>
        <entryRelationship typeCode="COMP">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability
of"/>
                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
            </observation>
        </entryRelationship>
    </observation>
</entryRelationship>
</act>
</entry>
</section>
</component>
</section>
```

```
</component>
</structuredBody>
```

Note in the example supra the last two <entryRelationship> elements are outside the <organizer>.

#### 6.6.4.2. Example negative – no antibiogram

Example based on this report:

Specimen	Intubation Aspirate
Macroscopic observation	Matig purulent
Culture	Commensalen +-

```
<structuredBody classCode="DOCBODY" moodCode="EVN">
  <component typeCode="COMP">
    <section classCode="DOCSECT">
      <templateId root="1.3.6.1.4.1.19376.1.3.3.2.1"/>
      <!-- section 1st level (the specialty section): the specialty title in LOINC-->
      <code code="18769-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="MICROBIAL SUSCEPTIBILITY TESTS"/>
      <component typeCode="COMP">
        <section>
          <!-- section 2nd level( the report item section): title in LOINC or other -->
          <templateId root="1.3.6.1.4.1.19376.1.3.3.2.2"/>
          <code code="118246004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="laboratory observations"/>
          <text>
            <content/>
          </text>
        </section>
        <entry typeCode="DRIV">
          <!--entry ALWAYS has ONE <act>: the specimen act -->
          <!--Template Id : Mandatory and fixed. Identifies this entry as a Laboratory Report Data - Processing Entry.-->
          <templateId root="1.3.6.1.4.1.19376.1.3.1"/>
          <!-- here begins what we call the 'specimen act' -->
          <act classCode="ACT" moodCode="EVN">
            <code code="118246004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="laboratory observations"/>
```

```
<statusCode code="completed"/>
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.3.6777.10.1"/>
        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability
of"/>
        <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
    </observation>
</entryRelationship>

<entryRelationship typeCode="COMP">
    <procedure classCode="PROC" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.2"/>
        <code code="33882-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Specimen Collection">
        </code>
        <!--time of specimen collection -->
        <effectiveTime value="20150201"/>
        <targetSiteCode code="26412008" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Intubation"/>
        <participant typeCode="PRD">
            <participantRole classCode="SPEC">
                <idextension="1" root="NumberingSystem" />
                <playingEntity classCode="ENT">
                    <code code="119295008" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Aspirate"/>
                    </playingEntity>
                </participantRole>
            </participant>
            <entryRelationship typeCode="COMP">
                <act classCode="ACT" moodCode="EVN">
                    <templateId root="1.3.6.1.4.1.19376.1.3.1.3"/>
                    <!--time of receiving specimen -->
                    <code code="SPRECEIVE" codeSystem="1.3.5.1.4.1.19376.1.5.3.2" codeSystemName="IHEActCode"/>
                    <effectiveTime value="20150202"/>
                </act>
            </entryRelationship>
        </procedure>
    </entryRelationship>
    <entryRelationship typeCode="COMP">
        <observation classCode="OBS" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
            <code code="74574-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Macroscopic observation"/>
            <statusCode code="completed"/>
            <effectiveTime value="20150202230000.0000-0500"/>
            <value xsi:type="ST">matig purulent</value>
        </observation>
    </entryRelationship>

```

```
<code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/>
<value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode"
displayName="available"/>
    </observation>
</entryRelationship>
    <observation>
</entryRelationship>
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
        <code code="89029-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Microbiology Culture"/>
        <statusCode code="completed"/>
        <effectiveTime value="20150202230000.0000-0500"/>
        <value xsi:type="ST">Commensalen +</value>
    <entryRelationship typeCode="COMP">
        <observation classCode="OBS" moodCode="EVN">
            <templateId root="2.16.840.1.113883.3.6777.10.1"/>
            <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability of"/>
            <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian statusCode"
displayName="available"/>
                </observation>
            </entryRelationship>
                <observation>
            </entryRelationship>
            <act>
                </entry>
            </section>
        </component>
    </section>
</component>
</structuredBody>
```

#### 6.6.4.3. Example antibiogram as text blob

In case a laboratory has to send its antibiogram as a formatted text blob, it will be treated and send as a Base64 content.

Staal Specificatie	peroperatief staal	
Staal Specificatie	abdominaal vocht	Val
Gramkleuring	WBC +- gram-negatieve staven +++	Val
	gram+ cocci +	Val
Kweek (isolaten, ABgram...)	1: : Klebsiella pneumoniae +++	
	2: : Enterococcus faecium +	
	3: : Streptococcus mitis groep +	Val
Antibiogram		1 2 3
	Ampicilline/Amoxicilline	R R I
	Cotrimoxazol	S
	Vancomycine	S S
	Clindamycine	S
	Nitrofurantoin	S
	Cefuroxim	S
	Gentamycine	S
	Colimycine	S
	Temocilline	S
	Fosfomycine	S
	Ofloxacin/levofloxacin	S
	Amoxy-clavulaanzuur	S
	Amikacine	S
	Piperacilline/tazobactam	S
	Cefotaxim/ceftriaxone	S
	Ceftazidime	S
	Meropenem	S

Figure 3 - Example of antibiogram as formatted text

This result can be send like this:

```

<structuredBody classCode="DOCBODY" moodCode="EVN">
  <component typeCode="COMP">
    <section classCode="DOCSECT">
      <templateId root="1.3.6.1.4.1.19376.1.3.3.2.1"/>
      <!-- section 1st level (the specialty section): the specialty title in LOINC-->
      <code code="18769-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="MICROBIAL SUSCEPTIBILITY TESTS"/>
      <component typeCode="COMP">
        <section>
          <!-- section 2nd level( the report item section): title in LOINC or other -->
          <templateId root="1.3.6.1.4.1.19376.1.3.3.2.2"/>

```



ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIEFtcGljaWxsaw5Il0Ftb3hpY2ls  
bGluZSBSICAgUiAglEkNCIAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICBDb3RyaW1veGF6b2wgICAgICAgICAgICAgUw0KICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICAgIFZhbmnVbXljaW5IICAgICAgICAgICAgICAgICAgUyAgIFMN  
CIAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgUyAgIFMN  
bmUglCAgICAgICAgICAgICAgICAgICBTDQogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgTml0cm9mdXJhbnRvaW5IICAgICAgICAgICBDbZw1cm94aW0glCAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
Uw0KICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
aW5IICAgICAgICAgICAgICBTDQogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgQ29saW15Y2luZSAgICAgICAgICAgICAgIFMNCiAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICAgICBUZW1vY2lsbGluZSAgICAgICAgICAgUw0KICAg  
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgEZvc2ZvbXljaW5IICAg  
ICAgICAgICAgICBTDQogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgT2Zsb3hhY2luZS9sZXvZmxveGFjaW5IIFMNCiAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICBBbW94eS1jbGF2dWxhYW56dXVylCAgICAgUw0KICAgICAgICAg  
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICBTDQogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgUGlw  
ZXJhY2lsbGluZS90YXpvYmFjdGFtIFMNCiAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICBDZWZvdGF4aW0vY2VmDhJpYXhvbmUglCAgUw0KICAgICAgICAgICAg  
ICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCBT  
DQogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAg  
ICAgICAgICAgICAgIFMJDQoNCg== </value>  
    </observationMedia>  
    </entryRelationship>  
  </observation>  
  </entryRelationship>  
  </act>  
  </entry>  
  </section>  
  </component>  
 </section>  
</component>  
</structuredBody>

## 7. Description of the KMEHR message

### 7.1. Approach

This document makes the assumption the HL7 CDA message will be fully integrated in a KMEHR message.

Please refer to the example in Annex for the entire structure.

The KMEHR message will be constructed using all the minimally required elements. This means it will be a KMEHR message with a header element and one folder element.

The header element will have the required elements for the header, these are explained in detail below.

The folder element will have the minimally required elements about the patient and one transaction. The transaction will have the required elements and one <lnk> element that contains the actual CDA message encoded in Base64. The elements in this folder are explained in detail below.

### 7.2. KMEHR Header

#### 7.2.1. standard

This element follows the normal rules for a KMEHR message. This information is not mapped with information in the CDA message.

<cd S="CD-STANDARD" SV="1.24">20171201</cd>

#### 7.2.2. id

This uniquely identifies the KMEHR message. This value is mapped with ClinicalDocument/id.

#### 7.2.3. date

This is the date of the reporting of the examination(s). This is mapped with ClinicalDocument/effectiveTime.

Note this is only the most left part of the value in effectiveTime in format YYYY-MM-DD.

#### 7.2.4. time

This is the time of the reporting of the examination(s). This is mapped with ClinicalDocument/effectiveTime.

Note this is the part after the date in effectiveTime in format HH-MM-SS.

#### 7.2.5. sender

Sender, containing a <hcparty> is mapped with the <custodian> information in the CDA message.

- <id> is mapped with the extension value given for the NIHI.
- <cd> typically contains deptlaboratory or orglaboratory as value. (Not directly mapped with CDA – connected however with the NIHI value present in both CDA and KMEHR.)

### **7.2.6. recipient**

Recipient, containing a <hcparty> is mapped with the <informationRecipient> information in the CDA message.

- <id> is mapped with the extension value given for the NIHI.
- <cd> typically contains orghospital, persphysician as value. (Not directly mapped with CDA - connected however with the NIHI value present in both CDA and KMEHR.)

## **7.3. KMEHR Folder**

### **7.3.1. id**

- The <id> follows the KMEHR rules and is <id S="ID-KMEHR" SV="1.0">1</id>.

### **7.3.2. patient**

The <patient> is mapped with the <recordTarget>.

- <id> in KMEHR contains the INSS. This is mapped with the value in the extension attribute of patientRole/id
  - When patientRole/id is a nullFlavor, in KMEHR use: <id S="ID-PATIENT" SV="1.0"/>
- <firstname> is mapped with patientRole/patient/name/given
- <familyname> is mapped with patientRole/patient/name/family
- <sex> is mapped with the code attribute in patientRole/patient/administrativeGenderCode

### **7.3.3. transaction**

- <id> is not mapped with any value. It is <id S="ID-KMEHR" SV="1.0">1</id>.
- <cd> is not mapped with any value. It is <cd S="CD-TRANSACTION" SV="1.8">labresult</cd>
- <date> is mapped with the effectiveTime in documentationOf/serviceEvent. Note this is only the most left part of the value in effectiveTime.
- <time> is mapped with the effectiveTime in documentationOf/serviceEvent. Note this is the part after the date in effectiveTime.
- <author> is mapped with <authenticator>
- <iscomplete> has the value true.
- <isvalidated> has the value true.

- <lnk> contains the CDA message<sup>26</sup>

#### **7.4. KMEHR XSD**

The message must validate on the KMEHR XSD.

The KMEHR XSD is available for download on

<https://www.ehealth.fgov.be/standards/kmehr/en/page/xschema>

---

<sup>26</sup> Refer to the example in Annex for the mediatype: it will be provided in KMEHR XSD in December 2017

## 8. Terminology and abbreviations

Term	Comments
Card.	Cardinality
CDA	This refers to the HL7 v3 Clinical Document Architecture R2. It is a XML-based mark-up standard intended to specify the encoding, structure and semantics of clinical documents for exchange. <sup>27</sup>
CDA XSD	A valid CDA message will validate on the structure as defined in the CDA XML Schema Definition.  The CDA schema is on <a href="http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7">http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7</a>
FPS Health	Belgian Federal Public Service of Health, Food chain safety and environment
HL7	Health Level-7 or HL7 refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers. <sup>28</sup>
KMEHR	Kind Messages for Electronic Healthcare Record
KMEHR XSD	A valid KMEHR message will validate on the structure as defined in the KMEHR XML Schema Definition.  The latest KMEHR XSD can be find on <a href="https://www.ehealth.fgov.be/standards/kmehr/en/page/xschema">https://www.ehealth.fgov.be/standards/kmehr/en/page/xschema</a>
LIS	Laboratory Information System
LOINC	Logical Observation Identifiers Names and Codes (LOINC) is a database and universal standard for identifying medical laboratory observations. <sup>29</sup>  In this document, the use of LOINC codes always refers to the subset of LOINC codes to use in Belgian context as defined by FPS Health.
UC	Use Case
UCUM	Unified Code for Units of Measure. System of codes for unambiguously representing measurement units to both humans and machines. <sup>30</sup>

<sup>27</sup>[http://en.wikipedia.org/wiki/Clinical\\_Document\\_Architecture](http://en.wikipedia.org/wiki/Clinical_Document_Architecture)

<sup>28</sup>[http://en.wikipedia.org/wiki/Health\\_Level\\_7](http://en.wikipedia.org/wiki/Health_Level_7)

<sup>29</sup><http://en.wikipedia.org/wiki/LOINC>

<sup>30</sup><http://unitsofmeasure.org/ucum.html>

Term	Comments
XML	Extensible Mark-up Language (XML) is a mark-up language that defines a set of rules for encoding documents in a format which is both human-readable and machine-readable. <sup>31</sup>
XSD	XML Schema Definition. Used to verify a XML adheres to a specific structural outline. A XML message that validates on a XSD is considered 'technically' valid.  There are however many extra rules in place that need to be followed for the message to be functionally relevant. Those rules are not checked by the XSD.

---

<sup>31</sup><http://en.wikipedia.org/wiki/XML>

## 9. Annex

### 9.1. eHealth Platform OID

The CDA messages use many OID's to refer to systems of codifications. (e.g. LOINC itself is referenced via an OID but the actual LOINC code itself is separate from that.)

As a general rule – whenever an OID exists already, that one should be used.

In specific cases however, where an OID for a coding system is needed but does not exist yet, the eHealth Platform created the ones in the table infra.

OID	Comments
2.16.840.1.113883.3.6777	Belgian eHealth platform root ID
2.16.840.1.113883.3.6777.11.1	Belgian CDA clinical document identifier
2.16.840.1.113883.3.6777.11.1.1	Belgian CDA laboratory report
2.16.840.1.113883.3.6777.11.1.3	Belgian CDA Laboratory Report Level 3
2.16.840.1.113883.3.6777.1.1	Message ID
2.16.840.1.113883.3.6777.12.1	Albert Code
2.16.840.1.113883.3.6777.5.2	NIHI (INAMI/RIZIV)
2.16.840.1.113883.3.6777.5.1	The Belgian national registry
2.16.840.1.113883.3.6777.10.1	Belgian template for statusCode
2.16.840.1.113883.3.6777.12.2	Belgian statuscodes

### 9.2. Use of foreign ID's

There is the possibility to identify persons with a different number in the CDA message. This list will be allowed to grow and where possible, it uses existing OID's to refer to the actual system.

OID	Comments
1.2.250.1.61	INSEE – code to refer to the national identification number in France.
2.16.840.1.113883.2.4.6.3	BSN – number to refer to national number in the Netherlands

### ***9.3. Bel\_AddressUse<sup>32</sup>***

This is a subset from the HL7 2.16.840.1.113883.5.1119 code system.

The functional KMEHR equivalent is CD-ADDRESS.

CDA Code	Comments	KMEHR CD-ADDRESS
HP	primary home	home
HV	vacation home	vacation
WP	work place	work

### ***9.4. Bel\_TelecomTypePartCode***

This is used within elements to define the kind of communication. (Cfr. The examples: in CDA this code is concatenated with the actual value and not used separately.)

The functional KMEHR equivalent is CD-TELECOM.

CDA Code	Comments	KMEHR CD-TELECOM
tel	telephone	phone
mob	mobile phone	mobile
fax	fax	fax
mailto	e-mail	email

#### **9.4.1. Structure of a telecommunication value**

TEL type	Structure	Description
tel	http://www.ietf.org/rfc/rfc3966.txt and http://www.ietf.org/rfc/rfc2806.txt	Structure of telephone number
fax	http://www.ietf.org/rfc/rfc3966.txt and http://www.ietf.org/rfc/rfc2806.txt	Structure of fax number
mailto	http://www.ietf.org/rfc/rfc2368.txt	Mail address structure
mob	http://www.ietf.org/rfc/rfc3966.txt and http://www.ietf.org/rfc/rfc2806.txt	Structure of telephone number

<sup>32</sup>In earlier documents this was called 'Bel\_UseCode'

### ***9.5. interpretationCode***

The ‘observation interpretation code’ used in CDA is the HL7 code that is uniquely identified by its OID ‘2.16.840.1.113883.5.83’.

The KMEHR table ‘CD-SEVERITY’ was functionally also used for this purpose.

For the laboratory message, it is recommended to consult the source for the possible CDA values:

[http://www.hl7.org/documentcenter/public\\_temp\\_05010D69-1C23-BA17-0CAF21876C62B00B/standards/vocabulary/vocabulary\\_tables/infrastructure/vocabulary/ObservationInterpretation.html](http://www.hl7.org/documentcenter/public_temp_05010D69-1C23-BA17-0CAF21876C62B00B/standards/vocabulary/vocabulary_tables/infrastructure/vocabulary/ObservationInterpretation.html)

### ***9.6. Belgian statusCode of an observation or reportitem***

The statusCode of an <observation> is expressed according to the Belgian status using an <entryRelationship> element within the <observation> element.

Code
initial
available
validated
changed
discontinued

The same statuscodes are used to express the status of a reportitem, using an <entryRelationship> element within the <act> element.

### ***9.7. statusCode of a specimen***

Code	Definition
initial	Sample is expected
available	The physical specimen is present and in good condition.
unavailable	There is no physical specimen because it is either lost, destroyed or consumed. (Optionally explain in a text comment)

unsatisfactory	The specimen cannot be used because of a quality issue such as a broken container, contamination, or too old.
entered-in-error	The specimen was entered in error and therefore nullified.

## 9.8. precondition criterion Code

The precondition criterion code used in CDA is not fully defined within the HL7 standard or as an OID.

In the laboratory result message use the values as they were already defined in the functional equivalent KMEHR table CD-REFSCOPE.

CDA Code	Comments	KMEHR CD-REFSCOPE
age	adjusted to the age of the patient	age
sex	adjusted to the sex of the patient	sex
gestational	adjusted to the gestational age	gestational

This code can then refer to an actual value (e.g. age.)

However, this code can also potentially refer to a different coded table (e.g. how to express a gender.)

### 9.8.1. AdministrativeGender

The ‘administrative gender code’ used in CDA is the HL7 code that is uniquely identified by its OID ‘2.16.840.1.113883.5.1’.

The KMEHR table ‘CD-SEX’ is functionally also used for this purpose.

For the laboratory message, it is recommend to consult the source for the possible CDA values:

[http://www.hl7.org/documentcenter/public\\_temp\\_FA54DBC0-1C23-BA17-0C2010EFAD046C99/standards/vocabulary/vocabulary\\_tables/infrastructure/vocabulary/AdministrativeGender.html](http://www.hl7.org/documentcenter/public_temp_FA54DBC0-1C23-BA17-0C2010EFAD046C99/standards/vocabulary/vocabulary_tables/infrastructure/vocabulary/AdministrativeGender.html)

CDA Code	Comments	KMEHR CD-SEX
F	Female	female
M	Male	male
UN	Undifferentiated	unknown

CDA Code	Comments	KMEHR CD-SEX
	Changed (according to MKG/RCM code) As this cannot be an official 'administrative' gender code – it is not available in the HL7 table. <sup>33</sup>	changed
<code code="SEX" nullFlavor="NI"/>	Undefined is functionally used in KMEHR to mean there is no information available – in HL7 CDA this is covered by the null flavour 'No Information.'	undefined

## 9.9. CDA Laboratory Specialty codes<sup>34</sup>

Use these codes to describe the laboratory specialty:

- 18717-9 BLOOD BANK STUDIES
- 18718-7 CELL MARKER STUDIES
- 18719-5 CHEMISTRY STUDIES
- 18720-3 COAGULATION STUDIES
- 18721-1 THERAPEUTIC DRUG MONITORING STUDIES
- 18722-9 FERTILITY STUDIES
- 18723-7 HEMATOLOGY STUDIES
- 18724-5 HLA STUDIES
- 18725-2 MICROBIOLOGY STUDIES
- 18727-8 SEROLOGY STUDIES
- 18728-6 TOXICOLOGY STUDIES
- 18729-4 URINALYSIS STUDIES
- 18767-4 BLOOD GAS STUDIES
- 18768-2 CELL COUNTS+DIFFERENTIAL STUDIES
- 18769-0 MICROBIAL SUSCEPTIBILITY TESTS
- 26435-8 MOLECULAR PATHOLOGY STUDIES

<sup>33</sup>HL7 codes do not really cover any granularity towards defining 'gender' different from 'sex' etc.

<sup>34</sup> This chapter is taken from [LABTFV3] §655

26436-6 LABORATORY STUDIES

26437-4 CHEMISTRY CHALLENGE STUDIES

26438-2 CYTOLOGY STUDIES

Notes:

- The choice of what observations to categorize under what specialty **are left ultimately to the discretion of the laboratory sending the results.** Some non-restrictive guidelines:
  - 18721-1 (THERAPEUTIC DRUG MONITORING STUDIES) will be used for a section carrying pharmacology observations on a patient.
  - Mycology and parasitology, as well as bacteriology, are part of the 18725-2 (MICROBIOLOGY STUDIES) specialty.
  - 665 Virology MAY be included in 18725-2 (MICROBIOLOGY STUDIES) specialty or 18727-8 (SEROLOGY STUDIES) or split between both specialties, depending upon the Content Creator Actor's choice

## ***9.10. Custom laboratory codes***

When laboratory results are sent using custom codes and if the system is in the table below, use the name of that system as it is written here.

codeSystemName	Definition
Medidoc	A laboratory code using custom codification of Medidoc systems

## ***9.11. Example of CDA***

The below message expresses the following data

---

Document Id: 11530231003.2015110413180000000

Document Created: November 4, 2015, 13:18:00 +0100

Time of prescription: November 1, 2015,14:41+0100

Results done: November 4, 2015,11:39+0100

Report status: Not final

--

PATIENT

Familyname: Murat

Given name: Joachim

Given name: Maarten

---

Date of birth: March 25, 1967  
Sex: Male  
Contact info: Primary Home:  
Bondgenotenlaan 6A  
Postbox 45  
LEUVEN 3000, BE  
House next to water  
Tel: +32165258787  
Email: joachim.murat@skynet.be  
Patient IDs: 67032537742 (NISS)

--

#### SENDING SYSTEM<sup>35</sup>

Name: Test-IT LabSoft  
Organization: GTL - General Testing Laboratory  
Organization ID: 81165343998 (NIHI)  
Contact info: Rue du George 6  
ROUX 6044, BEL  
Tel: +3225258787

--

#### SENDER<sup>36</sup>

---

<sup>35</sup>This information exists in the <author> tag in the CDA message, not to be confused with what is called 'author' in a KMEHR message.

Organization: GTL - General Testing Laboratory

Organization ID: 81165343998 (NIHI)

--

**RECIPIENT**

Information recipient: Leonard McCoy

Contact info Workplace:

Tel: +3225258656

Organization Hopital civil de Charleroi

Organization ID 10051178001 (NIHI)

--

**AUTHOR<sup>37</sup>**

Familyname: Davout

Given name: Louis

Given name: Nicolas

Author ID 554488997 (NIHI)

Contact info Rue du George 6

ROUX 6044, BEL

Tel: +3225258787

Organization: GTL - General Testing Laboratory

Organization ID: 81165343998 (NIHI)

---

<sup>36</sup>This information exists in the <custodian> tag in the CDA message.

<sup>37</sup>This information exists in the <authenticator> tag in the CDA message.

Contact info: Rue du George 6  
ROUX 6044, BEL  
Tel: +3225258787

--

Report specialty: HEMATOLOGY STUDIES - Laboratory Hematology results

Specimen: Blood

Specimen collection: 3 November, 2015

Specimen received: 4 November, 2015

Hemoglobin/Hematocrit

			Reference range	
Erythrocyte sedimentation rate	2	mm/h	0-30	mm/h
Screening				
Red blood cells (blood)	4.35	10 <sup>6</sup> /uL	3.93-5.01	10 <sup>6</sup> /uL
Hemoglobin	14.1	g/dL	11.8-14.8	g/dL

--

---

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="cda.xsl"?>
<!-- HL7 CDA Laboratory message - eHealth Platform -->
<!-- Only designed for illustration purpose. No valuable medical content. -->
<!-- Not representative of an exhaustive medical report. -->
<!-- This is an example: does not have the ambition to be comprehensive nor to address all possible scenarios -->
<!-- ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:lab="urn:oid:1.3.6.1.4.1.19376.1.3.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"-->
<ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:lab="urn:oid:1.3.6.1.4.1.19376.1.3.2">
```

```
<!--identify Belgium -->
<realmCode code="BE"/>
<!-- CDA R2 identification -->
<typeId extension="POCD_HD000040" root="2.16.840.1.113883.1.3"/>
<!-- Belgian CDA identification-->
<templateId root="2.16.840.1.113883.3.6777.11.1"/>
<!-- Belgian Lab identification -->
<templateId root="2.16.840.1.113883.3.6777.11.1.1"/>
<!-- level 3 identification -->
<templateId root="2.16.840.1.113883.3.6777.11.1.1.3"/>
<!-- HL7 XD LAB framework identification -->
<templateId root="1.3.6.1.4.1.19376.1.3.3"/>
<!-- root identifies Belgian numbering system, extension is actual unique number of document -->
<id root="2.16.840.1.113883.3.6777.1.1" extension="11530231003.2015110413180000000"/>
<!--The LOINC code to specify the general name of this report -->
<code code="18723-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="HEMATOLOGY STUDIES"/>
<!--the time when this CDA XML is created -->
<effectiveTime value="20151104131800+0100"/>
<!-- confidentiality always on 'Normal' - in the future other values might be used -->
<confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25" displayName="normal"/>
<!-- The general language code of the document (Acceptable codes are de-BE, fr-BE, nl-BE, en-BE) -->
<languageCode code="en-BE"/>
<!-- The setId is a unique number to refer to this document AND any new documents that will be replacements or new versions of this document. It is recommended to use a UUID as root with a certain extension but there is some liberty here. The use of this setId however is vital to the replace/final use cases of laboratory reports. -->
<setId extension="54ZETZER" root="1.50.915.2001"/>
<!--versionNumber to identify which number of document this is within the set -->
<versionNumber value="1"/>
<!-- target of the observations (i.e. normally the patient - if result not linked to a patient there is no use case to later find this report again) -->
<recordTarget typeCode="RCT">
  <patientRole classCode="PAT">
    <!-- NISS number (root refers to NISS Numbering system itself) -->
    <id root="2.16.840.1.113883.3.6777.5.1" extension="67032537742"/>
    <addr use="HP">
      <country>BE</country>
      <city>LEUVEN</city>
      <postalCode>3000</postalCode>
      <houseNumber>6</houseNumber>
      <houseNumberNumeric>A</houseNumberNumeric>
      <streetName>Bondgenotenlaan</streetName>
      <postBox>45</postBox>
      <additionalLocator>House next to water</additionalLocator>
    </addr>
    <telecom value="tel:+32165258787" use="HP"/>
    <telecom value="mailto:joachim.murat@skynet.be" use="HP"/>
    <patient classCode="PSN">
      <name>
```

```
<family>Murat</family>
<given>Joachim</given>
<given>Maarten</given>
</name>
<administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1" codeSystemName="HL7" displayName="Male"/>
<birthTime value="19670325"/>
</patient>
</patientRole>
</recordTarget>
<!-- Author element contains the credentials of the sending system that creates the message. Not to be confused with author in KMEHR! --&gt;
&lt;author typeCode="AUT"&gt;
&lt;time value="201511041139+0100"/&gt;
&lt;assignedAuthor&gt;
&lt;id nullFlavor="NI"/&gt;
&lt;addr use="WB"&gt;
&lt;country&gt;BE&lt;/country&gt;
&lt;city&gt;ROUX&lt;/city&gt;
&lt;postalCode&gt;6044&lt;/postalCode&gt;
&lt;houseNumber&gt;6&lt;/houseNumber&gt;
&lt;streetName&gt;Rue du George&lt;/streetName&gt;
&lt;/addr&gt;
&lt;telecom value="tel:+3225258787" use="HP"/&gt;
&lt;assignedAuthoringDevice&gt;
&lt;softwareName&gt;Test-IT LabSoft&lt;/softwareName&gt;
&lt;/assignedAuthoringDevice&gt;
&lt;representedOrganization&gt;
&lt;id extension="81165343998" root="2.16.840.1.113883.3.6777.5.2" assigningAuthorityName="NIHI"/&gt;
&lt;name&gt;GTL - General Testing Laboratory&lt;/name&gt;
&lt;telecom nullFlavor="NI"/&gt;
&lt;addr nullFlavor="NI"/&gt;
&lt;/representedOrganization&gt;
&lt;/assignedAuthor&gt;
&lt;/author&gt;
<!-- Custodian is the NIHI number (if known) and the name of the laboratory of the sending laboratory --&gt;
&lt;custodian typeCode="CST"&gt;
&lt;assignedCustodian classCode="ASSIGNED"&gt;
&lt;representedCustodianOrganization&gt;
&lt;id extension="81165343998" root="2.16.840.1.113883.3.6777.5.2" assigningAuthorityName="NIHI"/&gt;
&lt;name&gt;GTL - General Testing Laboratory&lt;/name&gt;
&lt;telecom nullFlavor="NI"/&gt;
&lt;addr nullFlavor="NI"/&gt;
&lt;/representedCustodianOrganization&gt;
&lt;/assignedCustodian&gt;
&lt;/custodian&gt;
<!-- InformationRecipient is the NIHI number (if known) and the name of the receiving party/ies --&gt;
&lt;informationRecipient typeCode="PRCP"&gt;
&lt;templateId root="1.3.6.1.4.1.19376.1.3.3.1.4"/&gt;
&lt;intendedRecipient&gt;</pre>
```

```
<id root="2.16.840.1.113883.3.6777.5.2" extension="115259412004" assigningAuthorityName="NIHI"/>
<addr nullFlavor="NI"/>
<telecom use="WP" value="tel:+3225258656"/>
<informationRecipient>
  <name>
    <family>McCoy</family>
    <given>Leonard</given>
  </name>
</informationRecipient>
<receivedOrganization>
  <id root="2.16.840.1.113883.3.6777.5.2" extension="10051178001" assigningAuthorityName="NIHI"/>
  <name>Hopital civil de Charleroi</name>
  <telecom nullFlavor="NI"/>
  <addr nullFlavor="NI"/>
</receivedOrganization>
</intendedRecipient>
</informationRecipient>

<authenticator typeCode="AUTHEN">
  <templateId root="1.3.6.1.4.1.19376.1.3.3.1.5"/>
  <time nullFlavor="NI"/>
  <!-- signatureCode is fixed obligatory element -->
  <signatureCode code="S"/>
  <assignedEntity>
    <id extension="554488997" root="2.16.840.1.113883.3.6777.5.2" assigningAuthorityName="NIHI"/>
    <addr use="WP">
      <country>BE</country>
      <city>ROUX</city>
      <postalCode>6044</postalCode>
      <houseNumber>6</houseNumber>
      <streetName>Rue du George</streetName>
    </addr>
    <telecom value="tel:+3225258787" use="HP"/>
    <assignedPerson>
      <name>
        <family>Davout</family>
        <given>Louis</given>
        <given>Nicolas</given>
      </name>
    </assignedPerson>
  <representedOrganization>
    <id extension="81165343998" root="2.16.840.1.113883.3.6777.5.2" assigningAuthorityName="NIHI"/>
    <name>GTL - General Testing Laboratory</name>
    <telecom value="tel:+3225258787" use="HP"/>
    <addr use="WP">
      <country>BE</country>
      <city>ROUX</city>
```

```
<postalCode>6044</postalCode>
<houseNumber>6</houseNumber>
<streetName>Rue du George</streetName>
</addr>
</representedOrganization>
</assignedEntity>
</authenticator>
<participant typeCode="REF">
  <templateId root="1.3.6.1.4.1.19376.1.3.3.1.6"/>
  <!-- This element on this level is used to model the time of the prescription -->
  <time value="201511011441+0100"/>
  <associatedEntity classCode="AGNT">
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <associatedPerson>
      <name nullFlavor="NI"/>
    </associatedPerson>
  </associatedEntity>
</participant>
<!-- in case of referrals, possibly a list of number references here using <inFulfillmentOf> element -->
<!-- identify the time when these results were done + elements for replace/final use cases-->
<inFulfillmentOf>
  <order>
    <id extension="12334546" root="TheOrderingSystem"/>
  </order>
</inFulfillmentOf>
<documentationOf>
  <serviceEvent>
    <!-- this report is not yet final -->
    <lab:statusCode code="active"/>
    <effectiveTime>
      <low value="201511041139+0100"/>
      <high value="201511041139+0100"/>
    </effectiveTime>
  </serviceEvent>
</documentationOf>
<component typeCode="COMP">
  <structuredBody classCode="DOCBODY" moodCode="EVN">
    <component typeCode="COMP">
      <section classCode="DOCSECT">
        <templateId root="1.3.6.1.4.1.19376.1.3.3.2.1"/>
        <!--Section: lab speciality -->
        <code code="18723-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="HEMATOLOGY STUDIES"/>
        <title>Laboratory Hematology Results</title>
        <component>
          <!-- section: lab report item -->
          <section>
            <templateId root="1.3.6.1.4.1.19376.1.3.3.2.2"/>
```

```
<code code="16931-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Hemoglobin/Hematocrit"/>
<text>
    <!-- container of free text elements used in this report item -->
    <content ID="Subtitle1">Screening</content>
</text>
<entry typeCode="DRIV">
    <!--entry ALWAYS has ONE <act>: the specimen act -->
    <!--Template Id : Mandatory and fixed. Identifies this entry as a Laboratory Report Data - Processing Entry.-->
    <templateId root="1.3.6.1.4.1.19376.1.3.1"/>
    <!-- here begins what we call the 'specimen act' -->
    <act classCode="ACT" moodCode="EVN">
        <code code="16931-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Hemoglobin/Hematocrit"/>
        <statusCode code="completed"/>
        <entryRelationship typeCode="COMP">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Availability
of"/>
                <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
            </observation>
        </entryRelationship>
        <entryRelationship typeCode="COMP">
            <procedure classCode="PROC" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.3.1.2"/>
                <code code="33882-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Specimen
Collection"/>
                <!--time of specimen collection -->
                <effectiveTime value="20151103"/>
                <participant typeCode="PRD">
                    <participantRole classCode="SPEC">
                        <id extension="1" root="LABNumberingSystem"/>
                        <playingEntity classCode="ENT">
                            <code code="119297000" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Blood"/>
                        </playingEntity>
                    </participantRole>
                </participant>
                <entryRelationship typeCode="COMP">
                    <act classCode="ACT" moodCode="EVN">
                        <templateId root="1.3.6.1.4.1.19376.1.3.1.3"/>
                        <!--time of receiving specimen -->
                        <code code="SPRECEIVE" codeSystem="1.3.5.1.4.1.19376.1.5.3.2" codeSystemName="IHEActCode"/>
                        <effectiveTime value="20151104"/>
                    </act>
                </entryRelationship>
            </procedure>
        </entryRelationship>
```

```
<!-- actual observations on this specimen -->
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
        <id nullFlavor="NI"/>
        <code code="30341-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Erythrocyte
sedimentation rate">
            </code>
            <statusCode code="completed"/>
            <effectiveTime value="201511040916"/>
            <value xsi:type="PQ" value="2" unit="mm/h"/>
            <specimen typeCode="SPC">
                <specimenRole classCode="SPEC">
                    <id extension="1" root="LABNumberingSystem"/>
                </specimenRole>
            </specimen>
            <entryRelationship typeCode="COMP">
                <observation classCode="OBS" moodCode="EVN">
                    <templateId root="2.16.840.1.113883.3.6777.10.1"/>
                    <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
                    <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
                </observation>
            </entryRelationship>
            <referenceRange typeCode="REFV">
                <observationRange classCode="OBS" moodCode="EVN.CRT">
                    <value xsi:type="IVL_PQ">
                        <low value="0" unit="mm/h"/>
                        <high value="30" unit="mm/h"/>
                    </value>
                    <interpretationCode code="N"/>
                </observationRange>
            </referenceRange>
        </observation>
    </entryRelationship>
    <!-- these next two observations are combined within an <act> comment element serving as a subtitle -->
    <entryRelationship typeCode="COMP">
        <act classCode="ACT" moodCode="EVN">
            <templateId root="2.16.840.1.113883.10.20.1.40"/>
            <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.2"/>
            <code code="48767-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Annotation
Comment"/>
            <text>
                <reference value="#Subtitle1"/>
            </text>
            <statusCode code="completed"/>
        <entryRelationship typeCode="COMP">
```

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.3.6777.10.1"/>
  <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
  <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2" codeSystemName="Belgian
statusCode" displayName="available"/>
</observation>
</entryRelationship>
<entryRelationship typeCode="COMP">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
    <id nullFlavor="NI"/>
    <code code="789-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Red blood cells
(blood)"/>
    <statusCode code="completed"/>
    <effectiveTime value="201511040916"/>
    <value xsi:type="PQ" value="4.35" unit="10*6/uL"/>
    <specimen typeCode="SPC">
      <specimenRole classCode="SPEC">
        <id extension="1" root="LABNumberingSystem"/>
      </specimenRole>
    </specimen>
    <entryRelationship typeCode="COMP">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.3.6777.10.1"/>
        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
        <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
      </observation>
    </entryRelationship>
    <referenceRange typeCode="REFV">
      <observationRange classCode="OBS" moodCode="EVN.CRT">
        <value xsi:type="IVL_PQ">
          <low value="3.93" unit="10*6/uL"/>
          <high value="5.01" unit="10*6/uL"/>
        </value>
        <interpretationCode code="N"/>
      </observationRange>
    </referenceRange>
  </observation>
</entryRelationship>
<entryRelationship typeCode="COMP">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.3.1.6"/>
    <id nullFlavor="NI"/>
    <code code="20563-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Hemoglobin"/>
    <statusCode code="completed"/>
```

```
<effectiveTime value="201511040916"/>
<value xsi:type="PQ" value="14.1" unit="g/dL"/>
<specimen typeCode="SPC">
    <specimenRole classCode="SPEC">
        <id extension="1" root="LABNumberingSystem"/>
    </specimenRole>
</specimen>
<entryRelationship typeCode="COMP">
    <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.3.6777.10.1"/>
        <code code="103328004" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT"
displayName="Availability of"/>
        <value xsi:type="CD" code="available" codeSystem="2.16.840.1.113883.3.6777.12.2"
codeSystemName="Belgian statusCode" displayName="available"/>
    </observation>
</entryRelationship>
<referenceRange typeCode="REFV">
    <observationRange classCode="OBS" moodCode="EVN.CRT">
        <value xsi:type="IVL_PQ">
            <low value="11.8" unit="g/dL"/>
            <high value="14.8" unit="g/dL"/>
        </value>
        <interpretationCode code="N"/>
    </observationRange>
</referenceRange>
</observation>
</entryRelationship>
</act>
</entryRelationship>
</act>
</entry>
</section>
</component>
</section>
</component>
</structuredBody>
</component>
</ClinicalDocument>
```

## 9.12. Example of KMEHR message

Concerning content, this message is based on part of the message above but is primarily used to show the KMEHR structure.

```
<!-- HL7 CDA Laboratory message in a KMEHR envelop - eHealth Platform -->
<!-- Only designed for illustration purpose. No valuable medical content. -->
<!-- Not representative of an exhaustive medical report. -->
<!-- This is an example: does not have the ambition to be comprehensive nor to address all possible scenarios -->
<kmehrmessage xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.ehealth.fgov.be/standards/kmehr/schema/v1"
xsi:schemaLocation="http://www.ehealth.fgov.be/standards/kmehr/schema/v1 kmehr_elements.xsd">
  <header>
    <standard>
      <cd S="CD-STANDARD" SV="1.24">20171201</cd>
    </standard>
    <!-- id maps to the value of the extension attribute in id in the root of CDA -->
    <id S="ID-KMEHR" SV="1.0">11530231003.2015110413180000000</id>
    <date>2015-11-04</date>
    <time>18:32:00</time>
    <!-- sender maps to the custodian in CDA -->
    <sender>
      <hcparty>
        <id S="ID-HCPARTY" SV="1.0">81165343998</id>
        <cd S="CD-HCPARTY" SV="1.9">orglaboratory</cd>
        <name>GTL - General Testing Laboratory</name>
      </hcparty>
    </sender>
    <!-- recipient maps to informationrecipient in CDA -->
    <recipient>
      <hcparty>
        <id S="ID-HCPARTY" SV="1.0">115259412004</id>
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