

HL7 CDA R2 Basic Requirements

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Abstract

This document describes the requirements related to HL7 CDA R2, which are not expressed in the CDA schema. This document represents a complete interpretation of IHE Europe / gazelle team of the standard; any improvements or remarks may be followed to the writer of the document Abderrazek Boufahja abderrazek.boufahja@ihe-europe.net or to the technical manager of IHE Europe eric.poiseau@ihe-europe.net.

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Introduction

The document describes the different requirements missing in the CDA schema. The extraction of the requirement is based on the documents of specifications [1, 2, 4, 5]. The first paragraph describes common requirements in the R-MIM and which are related to the RIM specification [2]. The second paragraph describes all the requirements which are related to R-MIM specification, or the main normative description of the CDA specification [1]. The third paragraph describes requirements related to the definition of data types, abstract specification [4], and the last section describes requirements related to the implementation technology specification of data types [5]. Some requirements are supported by an explanation from the book CDA TM Book, written by Keith W. Boone [3].

1 HL7 CDA R2 RIM Requirements

1.1 Act

[RIM-001] Act SHALL NOT have id element with nullFlavor, if there are other ids elements which are not null (3.1.1, [4])

Explanation : The paragraph 3.1.1 from the specification “Data Types - Abstract Specification” explains that if the SET of datatypes is not null, then any element of the set shall not be null.

[RIM-002] The ids elements of Act SHALL be distinct (3.1.1, [4])

Explanation : The Act contains elements id as a SET of datatypes, so according to paragraph 3.1.1 from the specification “Data Types - Abstract Specification”, the elements of the SET shall be distinct.

[RIM-003] The statusCode if presents SHALL be from the valueSet ActStatus

Explanation : The statusCode of Act is of type CNE.

1.2 Observation

[RIM-004] Observation SHALL NOT have interpretationCode element with nullFlavor, if there are other interpretationCode elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-005] The interpretationCode elements of Observation SHALL be distinct

Explanation : Same explanation as [RIM-002]

[RIM-006] Observation SHALL NOT have methodCode element with nullFlavor, if there are other methodCode elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-007] The methodCode elements of Observation SHALL be distinct
Explanation : Same explanation as [RIM-002]

[RIM-008] Observation SHALL NOT have targetSiteCode element with nullFlavor, if there are other targetSiteCode elements which are not null
Explanation : Same explanation as [RIM-001]

[RIM-009] The targetSiteCode elements of Observation SHALL be distinct
Explanation : Same explanation as [RIM-002]

1.3 Participation

[RIM-010] The signatureCode elements of Participation SHALL be from the valueSet ParticipationSignature
Explanation : The signatureCode is of type CNE. For CDA, this list of value contains only two values : X, S (the I is not used)

1.4 Role

[RIM-011] Role SHALL NOT have id element with nullFlavor, if there are other ids elements which are not null
Explanation : Same explanation as [RIM-001]

[RIM-012] The ids elements of Role SHALL be distinct
Explanation : Same explanation as [RIM-002]

[RIM-013] The statusCode if presents SHALL be from the valueSet RoleStatus
Explanation : The statusCode of Role is of type CNE.

As for CDA standard, only SET<AD> is used for the addr element, SET<TEL> is used for telecom element, and SET<EN> is used for name element, we introduced these further constraints :

[RIM-014] Role SHALL NOT have name element with nullFlavor, if there are other name elements which are not null
Explanation : Same explanation as [RIM-001]

[RIM-015] The name elements of Role SHALL be distinct
Explanation : Same explanation as [RIM-002]

[RIM-016] Role SHALL NOT have addr element with nullFlavor, if there are other addr elements which are not null
Explanation : Same explanation as [RIM-001]

[RIM-017] The addr elements of Role SHALL be distinct

Explanation : Same explanation as [RIM-002]

[RIM-018] Role SHALL NOT have telecom element with nullFlavor, if there are other telecom elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-019] The telecom elements of Role SHALL be distinct

Explanation : Same explanation as [RIM-002]

confidentialityCode is not used in CDA roles, that is why we do not introduce requirements related to this element.

1.5 Entity

[RIM-020] Entity SHALL NOT have id element with nullFlavor, if there are other ids elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-021] The ids elements of Entity SHALL be distinct

Explanation : Same explanation as [RIM-002]

The name and the telecom elements are used in CDA using a SET and not a BAG datatype, in the context of CDA, we will add these requirements :

[RIM-022] Entity SHALL NOT have name element with nullFlavor, if there are other name elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-023] The name elements of Entity SHALL be distinct

Explanation : Same explanation as [RIM-002]

[RIM-024] Entity SHALL NOT have telecom element with nullFlavor, if there are other telecom elements which are not null

Explanation : Same explanation as [RIM-001]

[RIM-025] The telecom elements of Entity SHALL be distinct

Explanation : Same explanation as [RIM-002]

2 HL7 CDA R2 R-MIM Requirements

2.1 Acts

2.1.1 Act

[RMIM-001] Act element SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

[RMIM-002] The languageCode shall be from the valueSet HumanLanguage
Explanation : The languageCode of Act is of type CNE.

2.1.2 Encounter

[RMIM-003] Encounter element SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

2.1.3 Observation

[RMIM-004] Observation element SHALL be conform to [RIM-001], [RIM-002], [RIM-003], [RIM-004], [RIM-005], [RIM-006], [RIM-007], [RIM-008] and [RIM-009]

[RMIM-005] The languageCode shall be from the valueSet HumanLanguage
Explanation : The languageCode of Observation is of type CNE

[RMIM-009] Numeric values SHALL NOT be communicated in Observation/value as a simple String (3.1.13.1, [2])

[RMIM-010] CS datatype SHALL NOT be used in value element, because only datatypes with codeSystem shall be used (3.1.13.1, [2])

[RMIM-011] interpretationCode values SHALL be from the valueSet ObservationInterpretation
Explanation : In the R-MIM model, the interpretationCode is of type CNE

2.1.4 ObservationMedia

[RMIM-012] ObservationMedia element SHALL be conform to [RIM-001] and [RIM-002]

2.1.5 Organizer

[RMIM-013] Organizer element SHALL be conform to [RIM-001] and [RIM-002]

2.1.6 Procedure

[RMIM-014] Procedure element SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

[RMIM-015] The languageCode shall be from the valueSet HumanLanguage
Explanation : The languageCode of Observation is of type CNE

[RMIM-017] Procedure SHALL NOT have methodCode element with nullFlavor, if there are other methodCode elements which are not null
Explanation : Same explanation as [RIM-001]

[RMIM-018] The methodCode elements of Procedure SHALL be distinct
Explanation : Same explanation as [RIM-002]

[RMIM-019] Procedure SHALL NOT have approachSiteCode element with nullFlavor, if there are other approachSiteCode elements which are not null
Explanation : Same explanation as [RIM-001]

[RMIM-020] The approachSiteCode elements of Procedure SHALL be distinct
Explanation : Same explanation as [RIM-002]

[RMIM-021] Procedure SHALL NOT have targetSiteCode element with nullFlavor, if there are other targetSiteCode elements which are not null
Explanation : Same explanation as [RIM-001]

[RMIM-022] The targetSiteCode elements of Procedure SHALL be distinct
Explanation : Same explanation as [RIM-002]

2.1.7 RegionOfInterest

[RMIM-023] RegionOfInterest element SHALL be conform to [RIM-001] and [RIM-002]

[RMIM-024] A RegionOfInterest SHALL have an entryRelationship[typeCode="SUBJ"]/observationMedia, or it SHALL be included into an observationMedia/entryRelationship[@typeCode="SUBJ" and @inversionInd="true"], or it SHALL include an external Observation into reference[typeCode="SUBJ"]/ExternalObservation

Explanation : In[1], paragraph 4.3.6.7, the specification says “The relationship between a RegionOfInterest and its referenced ObservationMedia or ExternalObservation is specified by traversing the entryRelationship or reference class, respectively, where typeCode equals "SUBJ"”

[RMIM-025] A RegionOfInterest must reference exactly one ObservationMedia or one ExternalObservation (4.3.6.7, [1])

Explanation : In[1], paragraph 4.3.6.7, the specification says “A RegionOfInterest must reference exactly one ObservationMedia or one ExternalObservation”

[RMIM-026] if regionOfInterest is target of a renderMultimedia then it shall have exactly one ObservationMedia and not an ExternalObservation (4.3.5.2, [1])

[RMIM-028] The code of RegionOfInterest if present SHALL be from ROIOverlayShape valueSet

Explanation : The code of RegionOfInterest is of type CNE

[RMIM-029] The value list SHALL contain a pair number of values

Explanation : The value list describe a list of pixels, that's give the pair property of this list

[RMIM-030] If the code has the value CIRCLE, the value list SHALL have 4 values (Table 107, [1])

[RMIM-031] If the code has the value ELLIPSE, the value list SHALL have 8 values (Table 107, [1])

2.1.8 SubstanceAdministration

[RMIM-032] SubstanceAdministration element SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

[RMIM-033] The approachSiteCode elements of SubstanceAdministration SHALL be distinct

Explanation : Same explanation as [RIM-002]

[RMIM-034] SubstanceAdministration SHALL NOT have approachSiteCode element with nullFlavor, if there are other approachSiteCode elements which are not null

Explanation : Same explanation as [RIM-001]

2.1.9 Supply

[RMIM-035] Supply element SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

[RMIM-036] The priorityCode elements of Supply SHALL be distinct

Explanation : Same explanation as [RIM-002]

[RMIM-037] Supply SHALL NOT have priorityCode element with nullFlavor, if there are other priorityCode elements which are not null

Explanation : Same explanation as [RIM-001]

2.1.10 ObservationRange

[RMIM-038] Numeric values SHALL NOT be communicated in ObservationRange/value as a simple String **Explanation :** Same Explanation as [RMIM-009]

[RMIM-039] CS datatype SHALL NOT be used in value element, because only datatypes with codeSystem shall be used **Explanation :** Same Explanation as [RMIM-010]

[RMIM-040] interpretationCode values SHALL be from the valueSet ObservationInterpretation **Explanation :** Same Explanation as [RMIM-011]

2.1.11 Criterion

[RMIM-041] Numeric values SHALL NOT be communicated in Criterion/value as a simple String **Explanation :** Same Explanation as [RMIM-009]

[RMIM-042] CS datatype SHALL NOT be used in value element, because only datatypes with codeSystem shall be used **Explanation :** Same Explanation as [RMIM-010]

2.1.12 ExternalAct

[RMIM-043] ExternalAct element SHALL be conform to [RIM-001] and [RIM-002]

2.1.13 ExternalObservation

[RMIM-044] ExternalObservation element SHALL be conform to [RIM-001] and [RIM-002]

2.1.14 ExternalProcedure

[RMIM-045] ExternalProcedure element SHALL be conform to [RIM-001] and [RIM-002]

2.1.15 ExternalDocument

[RMIM-046] ExternalDocument element SHALL be conform to [RIM-001] and [RIM-002]

2.1.16 NonXMLBody

[RMIM-047] The languageCode shall be from the valueSet HumanLanguage **Explanation :** The languageCode of NonXMLBody is of type CNE

[RMIM-048] The content of text element SHALL be in other form than XML form

Explanation : In the paragraph 4.3.1.1, specification [1], it was specified that “The NonXMLBody class represents a document body that is in some format other than XML”

2.1.17 StructuredBody

[RMIM-049] The languageCode shall be from the valueSet HumanLanguage

Explanation : The languageCode of StructuredBody is of type CNE

2.1.18 Section

[RMIM-050] The languageCode shall be from the valueSet HumanLanguage

Explanation : The languageCode of Section is of type CNE

[RMIM-051] The Section.id element is unique into the CDA Document

Explanation : The paragraph 4.3.2.1 from the specification [1] describe this feature. Keith Boone has described also this feature in his book [3], page 175 !!

[RMIM-052] Section.text SHALL be specified, as it is a required element (section 5, [1])

2.1.19 ParentDocument

[RMIM-053] ParentDocument SHALL be conform to [RIM-001] and [RIM-002]

[RMIM-054] ParentDocument/text.BIN element SHALL NOT be used

Explanation : Only text/reference SHALL be used (paragraph 4.2.3.1[1], confirmed also by [3])

[RMIM-055] ParentDocument/id SHALL be different from the id of ClinicalDocument/id, when the typeCode=RPLC or typeCode=APND

Explanation : Requirement specified in paragraph 4.2.3.1, specification [1] : “Every CDA document must have a unique ClinicalDocument.id, and thus the replacement or addendum documents each have ClinicalDocument.id that is different from that of the parent document”

[RMIM-056] All documents in a chain of replacement SHALL have the same setId, and a versionNumber incrementing

Explanation : Requirement specified in paragraph 4.2.3.1, specification [1] : “In this scheme, all documents in a chain of replacements have the same ClinicalDocument.setId and are distinguished by an incrementing ClinicalDocument.versionNumber”

2.1.20 ServiceEvent

[RMIM-057] ServiceEvent SHALL be conform to [RIM-001] and [RIM-002]

2.1.21 Order

[RMIM-058] Order SHALL be conform to [RIM-001] and [RIM-002]

2.1.22 Consent

[RMIM-059] Consent SHALL be conform to [RIM-001], [RIM-002] and [RIM-003]

[RMIM-060] consent.statusCode SHALL have the value 'completed' (or nothing) **Explanation :** This is the default (and unique) value of consent.statusCode as it was specified in the specification [1], paragraph 4.2.3.4

2.1.23 EncompassingEncounter

[RMIM-061] EncompassingEncounter SHALL be conform to [RIM-001] and [RIM-002]

2.1.24 ClinicalDocument

[RMIM-063] The languageCode shall be from the valueSet HumanLanguage
Explanation : The languageCode of ClinicalDocument is of type CNE

[RMIM-064] copyTime SHOULD NOT be used (4.2.1.9, [1])

2.2 ActRelationships

2.2.1 RelatedDocument

[RMIM-065] Only these combination of relatedDocument MAY be present : (APND), (RPLC), (XFR), (XFRM, RPLC), (XFRM, APND)
Reference : Paragraph 4.2.3.1, specification [1]

2.2.2 Entry

[RMIM-066] When entry@typeCode=DRIV, the section containing the entry SHALL contain a text element

Explanation : Requirement extracted from paragraph 4.3.4.2, specification : "The entry relationship "DRIV" can be used in the special case where the narrative is fully derived from CDA Entries"

2.3 Participations

2.3.1 Authenticator

[RMIM-067] Authenticator SHALL be conform to [RIM-010]

[RMIM-068] The authenticator.signatureCode elements SHOULD NOT have the value X

Explanation : the use of X as authenticator.signatureCode is deprecated (paragraph 4.2.2.1, specification [1])

2.3.2 LegalAuthenticator

[RMIM-069] LegalAuthenticator SHALL be conform to [RIM-010]

[RMIM-070] The legalAuthenticator.signatureCode elements SHOULD NOT have the value X

Explanation : the use of X as authenticator.signatureCode is deprecated (paragraph 4.2.2.8, specification [1])

2.4 Roles

2.4.1 OrganizationPartOf

[RMIM-071] OrganizationPartOf SHALL be conform to [RIM-011], [RIM-012], and [RIM-013]

2.4.2 AssignedEntity

[RMIM-072] AssignedEntity SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-073] If assignedEntity has not a null of flavor and its enclosing participation has not a null of flavor, it SHALL have an assignedPerson or a representedOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null (specification [2], paragraph 4.16)

2.4.3 IntendedRecipient

[RMIM-074] IntendedRecipient SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-075] If intendedRecipient has not a null of flavor and its enclosing informationRecipient has not a null of flavor, it SHALL have an informationRecipient or a receivedOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null(specification [2], paragraph 4.16)

[RMIM-076] When intendedRecipient=HLTHCHRT, the informationRecipient SHALL NOT be provided

Explanation : This requirement is specified in the paragraph 4.2.2.7, specification [1]

2.4.4 AssignedAuthor

[RMIM-077] AssignedAuthor SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-078] If assignedAuthor has not a null of flavor and its enclosing author has not a null of flavor, it SHALL have an assignedAuthorChoice, or a representedOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null(specification [2], paragraph 4.16)

2.4.5 PatientRole

[RMIM-079] PatientRole SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-080] If patientRole has not a null of flavor and its enclosing record-Target has not a null of flavor, it SHALL have a patient entity, or a providerOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null(specification [2], paragraph 4.16)

2.4.6 Guardian

[RMIM-081] Guardian SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

2.4.7 RelatedEntity

[RMIM-082] RelatedEntity SHALL be conform to [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

2.4.8 AssociatedEntity

[RMIM-083] AssociatedEntity SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-084] If associatedEntity has not a null of flavor and its enclosing participant has not a null of flavor, it SHALL have an associatedEntity, or a scopingOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null(specification [2], paragraph 4.16)

2.4.9 HealthCareFacility

[RMIM-085] HealthCareFacility SHALL be conform to [RIM-011] and [RIM-012]

[RMIM-086] If healthCareFacility has not a null of flavor and its enclosing location has not a null of flavor, it SHALL have a location or a serviceProviderOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null (specification [2], paragraph 4.16)

2.4.10 RelatedSubject

[RMIM-087] RelatedSubject SHALL be conform to [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

2.4.11 ManufacturedProduct

[RMIM-089] ManufacturedProduct SHALL be conform to [RIM-011] and [RIM-012]

[RMIM-090] If manufacturedProduct has not a null of flavor and its enclosing participation has not a null of flavor, it SHALL have a manufacturedDrugOrOth, or a manufacturerOrganization

Explanation : On a role, the player or the scoper shall be defined if the element is not null (specification [2], paragraph 4.16)

2.4.12 SpecimenRole

[RMIM-091] SpecimenRole SHALL be conform to [RIM-011] and [RIM-012]

2.4.13 ParticipantRole

[RMIM-092] ParticipantRole SHALL be conform to [RIM-011], [RIM-012], [RIM-016], [RIM-017], [RIM-018] and [RIM-019]

[RMIM-093] If participantRole has not a null of flavor and its enclosing participant has not a null of flavor, it SHALL have a scopingEntity, or a playingEntityChoice

Explanation : On a role, the player or the scoper shall be defined if the element is not null (specification [2], paragraph 4.16)

2.5 Entities

2.5.1 Organization

[RMIM-094] Organization SHALL be conform to [RIM-020], [RIM-021], [RIM-022], [RIM-023], [RIM-024] and [RIM-025]

[RMIM-095] Organization SHALL NOT have addr element with nullFlavor, if there are other addr elements which are not null

Explanation : Same explanation as [RIM-001]

[RMIM-096] The addr elements of Organization SHALL be distinct
Explanation : Same explanation as [RIM-002]

2.5.2 Person

[RMIM-097] Person SHALL be conform to [RIM-022] and [RIM-023]

2.5.3 AuthoringDevice

[RMIM-098] asMaintainedEntity SHOULD NOT be used

Explanation : This requirement is under the paragraph 4.2.2.2, specification [1]

2.5.4 CustodianOrganization

[RMIM-099] CustodianOrganization SHALL be conform to [RIM-020] and [RIM-021]

[RMIM-100] id element SHALL be present and is mandatory

Explanation : The id element shall not be nullFlavored

2.5.5 Patient

[RMIM-101] CustodianOrganization SHALL be conform to [RIM-022] and [RIM-023]

[RMIM-102] id element SHOULD NOT be present

Explanation : The id element is deprecated

2.5.6 SubjectPerson

[RMIM-103] SubjectPerson SHALL be conform to [RIM-022] and [RIM-023]

2.5.7 PlayingEntity

[RMIM-104] PlayingEntity SHALL be conform to [RIM-022] and [RIM-023]

[RMIM-105] PlayingEntity SHALL NOT have quantity element with nullFlavor, if there are other quantity elements which are not null

Explanation : Same explanation as [RIM-001]

[RMIM-106] The quantity elements of PlayingEntity SHALL be distinct

Explanation : Same explanation as [RIM-002]

2.5.8 Entity

[RMIM-107] Entity SHALL be conform to [RIM-020] and [RIM-021]

2.6 Narrative Block Requirements

[RMIM-108] The linkHtml/name element SHOULD NOT be used (4.3.5.2, [1])

[RMIM-109] renderMultimedia@referencedObject SHALL have a value of ObservationMultimedia or RegionOfInterest within the same document (4.3.5.6, [1])

[RMIM-110] renderMultimedia SHALL refer to a single observationMedia, or to multiple regionOfInterest (4.3.5.6, [1])

[RMIM-111] if renderMultimedia referer to multiple regionOfInterest, all these regionOfInterest SHALL be from the same observation (4.3.5.6, [1])

[RMIM-112] table.border, table.cellpadding, table.cellspacing SHOULD NOT be used (4.3.5.9, [1])

[RMIM-113] the footnoteref SHALL reference a footnote in the same document (4.3.5.12, [1])

[RMIM-114] Ordered list style SHOULD be used only on the element list, with listType=ordered (4.3.5.11, [1])

[RMIM-115] Unordered list style SHOULD be used only on the element list, with listType=unordered (4.3.5.11, [1])

[RMIM-116] if <caption> present in the <paragraph> element, it shall be done before any other character data, including whitespaces (4.3.5.7, [1])

3 HL7 CDA R2 Datatypes Requirements

3.1 Datatypes Requirements

All the requirements of this section are from the specification “Data Types - Abstract Specification” ([4])

[CDADT-001] NP value of nullFlavor is not used for CDA documents

Explanation : This value is used only on messages and not in application data, as it was specified in 1.11.4, specs [4]

[CDADT-002] mediaType of the ED datatype SHOULD be from known mediaTypes

[CDADT-003] In ED datatype, if integrityCheck attribute is provided, it SHALL have a valid value according to its integrityCheckAlgorithm

[CDADT-004] In CD datatype, codeSystem attribute SHALL be provided when codeSystemName is provided (2.6.3 , [4])

[CDADT-005] In CD datatype, codeSystem attribute SHALL be provided when codeSystemVersion is provided (2.6.4 , [4])

[CDADT-006] In CD datatype, code attribute SHALL be provided when displayName is provided (2.6.5 , [4])

[CDADT-007] In CD datatype, originalText attribute SHALL NOT have multimedia value, only reference or plain text form are allowed (2.6.6 , [4])

[CDADT-008] In CD datatype, if the nullFlavor is not defined, the code SHALL be provided

Explanation : see the paragraph 2.6.1, even if the originalText is defined, it does not override the fact that the code is null, and a nullFlavor shall be specified.

[CDADT-009] In CS datatype, if the nullFlavor is not defined, the code SHALL be provided (2.8.1 , [4])

[CDADT-010] In SC datatype, code SHALL NOT be given without the text (2.12 , [4])

[CDADT-011] When UUID is used, the hexadecimal digits A-F SHALL be in upper case (2.15.1 , [4])

[CDADT-012] In II datatype, when nullFlavor is not defined, the root SHALL be provided (2.17.1 , [4])

[CDADT-013] the structure of URL datatype SHALL be : “[a-z0-9+.-]+/” ST” (2.18.3 , [4])

[CDADT-014] When the URL datatype is tel or fax, the structure of the litteral is specified according to RFC 3966 and RFC 2806

Explanation : see the paragraph 2.18.3. The tel or fax shall be conform to a specific regex

[CDADT-015] the qualifier of PN datatype SHALL NOT include LS as value (2.25 , [4])

[CDADT-016] In RTO datatype, the denominator SHALL NOT be zero (2.30.2 , [4])

[CDADT-017] In IVL<T> datatypes, the low value SHALL be lessOrEqual the high value (2.6.3 , [4])

[CDADT-018] In IVL<PQ> datatypes, the low and high values SHALL use comparable units (3.7 , [4])

[CDADT-019] In IVL<TS>, the width/@unit SHALL be from mesure of time values (d, min, etc) (3.8 , [4])

[CDADT-020] IN CD datatype, when CD/@nullFlavor="OTH", the CD/@codeSystem SHALL be present (2.8.2 , [4])

[CDADT-021] IN EIVL datatype, event is fixed to one value from the table 45 (5.2.1 , [4])

[CDADT-022] The use of nullFlavor PINF and NINF SHALL be for datatypes QTY

[CDADT-023] In ED datatype, if it is not null, it SHALL have a binary string or reference element (2.4.1 , [4])

[CDADT-025] In CR datatype, if it is not null, value element SHALL not be null (2.4.8 , [4])

[CDADT-026] In TN datatype, if it is not null, the string value SHALL be provided and not empty, even after formatting it (2.24 , [4])

[CDADT-027] In MO datatype, the currency unit SHALL be from ISO 4217 (2.33.2 , [4])

[CDADT-028] In PIVL datatype, if it is not null, it SHALL have a period (5.1.2 , [4])

[CDADT-029] In CD datatype, the translation elements SHALL be distinct (2.6.7 , [4])

[CDADT-030] In CD datatype, the translation elements SHALL not be null if there are translations which are not null (2.6.7 , [4])

[CDADT-031] In TEL datatype, the use attribute SHALL have distinct values (2.19.2 , [4])

[CDADT-032] In AD datatype, the use attribute SHALL have distinct values (2.21.1 , [4])

[CDADT-033] In ENXP datatype, the qualifier attribute SHALL have distinct values (2.22.2 , [4])

[CDADT-034] In EN datatype, the use attribute SHALL have distinct values (2.23.1 , [4])

[CDADT-035] In PQ datatype, the translation elements SHALL have distinct values (2.31.3 , [4])

[CDADT-036] In PQ datatype, the translation elements SHALL not be null if there are translations which are not null (2.31.3 , [4])

4 HL7 CDA R2 Datatypes ITS Requirements

[DTITS-001] xml:lang SHALL NOT be used (1.4 , [5])

[DTITS-002] xsi:schemaLocation SHALL NOT be used (1.4 , [5])

[DTITS-003] xsi:noNamespaceSchemaLocation SHALL NOT be used, for the same reason of the prohibition of xsi:schemaLocation (1.4 , [5])

[DTITS-004] In ED datatype, mediaType attribute SHALL be as defined by RFC2046 (2.5.3 , [5])

[DTITS-005] In ED datatype, charset attribute SHALL be as defined by RFC2978 (2.5.4 , [5])

Explanation : The charset of all datatypes is inherited from the charset declared in the <?xml> declaration of the CDA document. A verification of the charset of the ED datatype could be a simple verification of the charset declared in the <?xml> declation.

[DTITS-006] In ED datatype, the language SHALL be as defined in RFC3066 (2.5.5 , [5])

[DTITS-007] In ED datatype, when it have both a reference form and an inline form, the reference and the inline SHALL point to the same data (2.5, [5])

Explanation : ED datatype can be present in one of two forms, inline or by reference (keith, p.56 !!). ED may have both inline and reference, but reference must point to the same data as provided inline. So, we SHALL avoid having <reference> element with white spaces, back lines, etc.

[DTITS-008] In URL datatype, the tel and fax number SHALL be as defined in RFC3966, which replace RFC2806 (2.16 , [5])

[DTITS-009] In URL datatype, the mail SHALL be as defined in RFC2368 (2.16 , [5])

[DTITS-010] In URL datatype, the http SHALL be as defined in RFC2396 (2.16 , [5])

[DTITS-011] In URL datatype, the ftp SHALL be as defined in RFC1738 (2.16 , [5])

[DTITS-012] In URL datatype, the file SHALL be as defined in RFC1738 (2.16 , [5])

[DTITS-013] In URL datatype, the nfs SHALL be as defined in RFC2224 (2.16 , [5])

[DTITS-014] In URL datatype, the telnet SHALL be as defined in RFC1738 (2.16 , [5])

[DTITS-015] In URL datatype, the modem SHALL be as defined in RFC3966 and RFC2806 (2.16 , [5])

[DTITS-016] In PIVL_TS datatype, unit attribute of period element SHALL have a value from the time units

[DTITS-017] In TS datatype, value SHALL have a valid timestamp (2.32, [5]) (p98, keith !!)

[DTITS-018] In TS datatype, value SHALL be present, otherwise nullFlavor shall be provided, not both (2.32, [5])

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