Technical White Paper – ACR Assist

Proposed Format for Specifying Point-of-Care Computer-Assisted Reporting/Decision Support Modules for Radiologists

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# INTRODUCTION

## Purpose

Explains the following

Schema structure

Description about each elements and attributes with their datatypes

Usage with samples

# Representation

## Colour patterns

Here is the representation style for each component in the schema.

Attributes: sample

Elements: sample

Optional: sample (optional)

## Datatypes

xsd:token - <https://www.w3.org/TR/xmlschema-2/#token>

xsd:anyURI - <https://www.w3.org/TR/xmlschema-2/#anyURI>

xsd:nonNegativeInteger - <https://www.w3.org/TR/xmlschema-2/#nonNegativeInteger>

xsd:integer - <https://www.w3.org/TR/xmlschema-2/#integer>

xsd:ID - <https://www.w3.org/TR/xmlschema-2/#ID>

xsd:Boolean - <https://www.w3.org/TR/xmlschema-2/#boolean>

xsd:decimal - <https://www.w3.org/TR/xmlschema-2/#decimal>

xsd: IDREF - <https://www.w3.org/TR/xmlschema-2/#IDREF>

xsd:positiveInteger - <https://www.w3.org/TR/xmlschema-2/#positiveInteger>

xsd:duration - <https://www.w3.org/TR/xmlschema-2/#duration>

# Schema structure

## Metadata

The metadata section contains general information about a CAR/DS guideline which may or may not be used by any given implementation.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description** |
| 1 | Label | text | Name of the XML |
| 2 | ID | text | XML module’s unique identifier |
| 3 | SchemaVersion | text | Schema version |
| 4 | RuleVersion | text | Module version. This can be updated each time when the xml has modified. |
| 5 | Info(optional)   |  |  |  |  | | --- | --- | --- | --- | | 5.1 | Description (optional) | text | Human readable description about the module. | | 5.2 | References (optional)  Contains one or more Citations.  Citation   |  |  |  |  | | --- | --- | --- | --- | | 5.2.1 | PubmedId (optional) | xsd:token | Pubmed reference Identifier  <https://www.ncbi.nlm.nih.gov/pubmed> | | 5.2.2 | URI (optional) | xsd:anyURI | Any Reference URI (for e.g.: link to abstract on journal website) | | 5.2.3 | text |  | citation text ( for e.g. : a bibliographic reference to the citation) | | | | | 5.3 | Diagrams (optional)  Contains different diagrams related to the module.  Diagram   |  |  |  |  | | --- | --- | --- | --- | | 5.3.1 | KeyDiagram  (optional) | "true" |"false" | Is it the key diagram (I.e. the diagram which summaries whether this is the overall clinical diagram) | | 5.3.2 | Displaysequence  (optional) | Integer | Image display sequence number. Images can be displayed in Displaysequence order | | 5.3.3 | imageElements | URI | Image URI | | 5.3.4 | Label  (optional) | text | Image Label | | | | | 5.4 | HelpText(optional) | text | Help text about the module. | | 5.5 | Contact(optional)   |  |  |  |  | | --- | --- | --- | --- | | 5.5.1 | Name | text | Author/Contact Name | | 5.5.2 | Email | text | Contact Email | | 5.5.3 | Institution(optional) | text | Contact Institution | | | | | | |
| 6 | ReportCitationText | text | Citation for the report text |
| 7 | Ontology(optional)  Specify body part and modality ( like CT-Chest, MR-abdomen) of the imaging exams for which this module can be used   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | AnatomicRegions  AnatomicRegions for which this module can be applicable  e.g. :  <AnatomicRegions codingSystemAttr="RADLEX">    <Region Code="RID88">Adrenal gland</Region>  <Region Code="RID89">Limb of adrenal gland</Region>    <Region Code="RID90">Medulla of adrenal gland</Region>  </AnatomicRegions>     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | codingSystemAttr  (optional) | text | The source of coding system used. This should be a URL | | 7.1.2 | Region   |  |  |  |  | | --- | --- | --- | --- | | 7.1.2.1 | Code | xsd:token | Author/Contact Name | | 7.1.2.2 | Text |  | Region text | | | | | | 7.2 | PossibleDiagnoses  For e.g. :  <PossibleDiagnoses>  <Diagnosis CodingSystem="ICD-10" Code="E27.9">Disorder of adrenal gland, unspecified</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4211">Adenoma</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4353">Myelolipoma</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID3890">Cyst</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4700">Hemorrhage</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID5231">Metastasis</Diagnosis>  </PossibleDiagnoses>       |  |  |  |  | | --- | --- | --- | --- | | 7.2.1 | CodingSystem  (optional) | text | the source of coding system used | | 7.2.2 | Diagnosis  can contain one or more diagnosis   |  |  |  |  | | --- | --- | --- | --- | | 7.2.2.1.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | | 7.2.2.1.2 | Code | xsd:token | Code in coding system | | | | | | | |
| 8 | ApplicableExams(optional)  contains one or more ApplicableExamCategory  <ApplicableExams>  <ApplicableExamCategory Axis="Modality">CT</ApplicableExamCategory>  <ApplicableExamCategory Axis="Anatomy">Chest</ApplicableExamCategory>  <ApplicableExamCategory Axis="Anatomy">Abdomen</ApplicableExamCategory>  </ApplicableExams>     |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 8.1 | ApplicableExamCategory   |  |  |  |  | | --- | --- | --- | --- | | 8.1.1 | Axis | "Modality" | "Anatomy" | Value can either Modality or Anatomy | | 8.1.2 | text |  | Applicable category text | | | | |
| 9 | ApplicableSexes   |  |  |  |  | | --- | --- | --- | --- | | 9.1 | Value | "Male"| "Female"|"Both" | Applicable sex | | | |
| 10 | ApplicableAgeGroups(optional)   |  |  |  |  | | --- | --- | --- | --- | | 10.1 | MinimumAge(optional) | xsd:nonNegativeInteger | applicable age min | | 10.2 | MaximumAge(optional) | xsd:nonNegativeInteger | applicable age max | | | |
| 11 | TextCues   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 11.1 | ContextPhrases(optional)  Context phrases used to identify parts of the radiology reports where this module may be applicable.   |  |  |  |  | | --- | --- | --- | --- | | 11.1.1 | ContextPhrase | text | phrase to find out the xml | | | | | 11.2 | KeyWords  Keywords to find the module   |  |  |  |  | | --- | --- | --- | --- | | 11.2.1 | Keyword | text | Keywords to find out module | | | | | 11.3 | NegationPhrases(optional)  Contains text markers which indicate the parts of a report to which the module is not applicable (even though it may contain markers that make it look like it is).   |  |  |  |  | | --- | --- | --- | --- | | 11.3.1 | NegationPhrase |  | Keywords to find out xml | | | | | 11.4 | Regex(optional) | text | Regex matches with test | | | |
| 12 | VoiceActivation(optional)  Contains phrases intended to be used as triggers for the module to find by voice recognition systems.   |  |  |  |  | | --- | --- | --- | --- | | 12.1 | VoiceCommandPhrase | text | The voice activation phrase for the voice recognition system to find the module. | | | |

### Sample

<Metadata>  
 <Label>Label0</Label>  
 <ID>ID0</ID>  
 <SchemaVersion>SchemaVersion0</SchemaVersion>  
 <RuleVersion>RuleVersion0</RuleVersion>  
 <Info>  
 <Description>Description0</Description>  
 <References>  
 <Citation PubmedId="PubmedId0" Url="http://www.url.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId1" Url="http://www.url.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId2" Url="http://www.url.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId3" Url="http://www.url.com/">  
 </Citation>  
 </References>  
 <Diagrams>  
 <Diagram KeyDiagram="true" DisplaySequence="0">  
 <imageElements>http://www.url.com/</imageElements>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram KeyDiagram="true" DisplaySequence="0">  
 <imageElements>http://www.url.com/</imageElements>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <HelpText>HelpText0</HelpText>  
 <Contact>  
 <Name>Name</Name>  
 <Email>Email</Email>  
 <Institution>Institution</Institution>  
 </Contact>  
 </Info>  
 <ReportCitationText>ReportCitationText0</ReportCitationText>  
 <Ontology>  
 <AnatomicRegions codingSystemAttr="codingSystemAttr0">  
 <Region Code="Code0">  
 </Region>  
 <Region Code="Code1">  
 </Region>  
 </AnatomicRegions>  
 <AnatomicRegions codingSystemAttr="codingSystemAttr1">  
 <Region Code="Code2">  
 </Region>  
 <Region Code="Code3">  
 </Region>  
 </AnatomicRegions>  
 <PossibleDiagnoses CodingSystem="CodingSystem0">  
 <Diagnosis CodingSystem="CodingSystem1" Code="Code4">  
 </Diagnosis>  
 <Diagnosis CodingSystem="CodingSystem2" Code="Code5">  
 </Diagnosis>  
 </PossibleDiagnoses>  
 <PossibleDiagnoses CodingSystem="CodingSystem3">  
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 </Diagnosis>  
 <Diagnosis CodingSystem="CodingSystem5" Code="Code7">  
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 </PossibleDiagnoses>  
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 <ApplicableExams>  
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 </ApplicableExamCategory>  
 </ApplicableExams>  
 <ApplicableSexes Value="Male"/>  
 <ApplicableAgeGroups>  
 <MinimumAge>50</MinimumAge>  
 <MaximumAge>50</MaximumAge>  
 </ApplicableAgeGroups>  
 <TextCues>  
 <ContextPhrases>  
 <ContextPhrase>ContextPhrase0</ContextPhrase>  
 <ContextPhrase>ContextPhrase1</ContextPhrase>  
 </ContextPhrases>  
 <KeyWords>  
 <KeyWord>KeyWord0</KeyWord>  
 <KeyWord>KeyWord1</KeyWord>  
 </KeyWords>  
 <NegationPhrases>  
 <NegationPhrase>NegationPhrase0</NegationPhrase>  
 <NegationPhrase>NegationPhrase1</NegationPhrase>  
 </NegationPhrases>  
 <Regex>Regex0</Regex>  
 </TextCues>  
 <VoiceActivation>  
 <VoiceCommandPhrase>VoiceCommandPhrase0</VoiceCommandPhrase>  
 <VoiceCommandPhrase>VoiceCommandPhrase1</VoiceCommandPhrase>  
 </VoiceActivation>  
</Metadata>

### Real-world Sample

<Metadata>   
 <Label>Hello RADS</Label>  
 <ID>Hello\_Rads\_1\_0</ID>  
 <SchemaVersion>1.0</SchemaVersion>  
 <RuleVersion>1.6</RuleVersion>  
 <Info>  
 <Description>This is a sample xml for characterizing liver lesion for MRI</Description>  
 <References>   
 <Citation Url="https://nrdr.acr.org/lirads/">  
 </Citation>  
 <Citation Url="https://nrdr.acr.org/liradsapp/">  
 </Citation>  
 </References>  
 <Diagrams>   
 <Diagram DisplaySequence="1" KeyDiagram="true">  
 <imageElements>https://nrdr.acr.org/lirads/ </imageElements>  
 <Label>ACR LI-RADS</Label>   
 </Diagram>  
 </Diagrams>  
 <Contact>  
 <Name>ACR Assist</Name>  
 <Email>acr-assist@acr.org</Email>  
 <Institution>American College of Radiology</Institution>  
 </Contact>  
 </Info>  
 <ReportCitationText/>  
 <Ontology>  
 <AnatomicRegions>  
 <Region Code=""></Region>  
 </AnatomicRegions>  
 <PossibleDiagnoses>  
 <Diagnosis Code=""></Diagnosis>  
 </PossibleDiagnoses>  
 </Ontology>  
 <ApplicableExams>  
 <ApplicableExamCategory Axis="Modality">  
 </ApplicableExamCategory>  
 <ApplicableExamCategory Axis="Anatomy"/>  
   
 </ApplicableExams>  
 <ApplicableSexes Value="Both"></ApplicableSexes>  
 <ApplicableAgeGroups>  
 <MinimumAge>1</MinimumAge>  
 </ApplicableAgeGroups>  
 <TextCues>  
 <ContextPhrases>  
 <ContextPhrase></ContextPhrase>  
 </ContextPhrases>  
 <KeyWords>  
 <KeyWord>LIRADS Liver lesion</KeyWord>   
 </KeyWords>  
 <NegationPhrases>  
 <NegationPhrase></NegationPhrase>  
 </NegationPhrases>  
 <Regex/>   
 </TextCues>  
 <VoiceActivation>  
 <VoiceCommandPhrase>LIRADS</VoiceCommandPhrase>  
 <VoiceCommandPhrase>Liver lesion</VoiceCommandPhrase>  
 <VoiceCommandPhrase>American College of Radiology</VoiceCommandPhrase>   
 </VoiceActivation>  
 </Metadata>

## DataElements

The data element definitions specify the input values used to drive a decision tree, the constant values, and possibly intermediate or output values associated with an algorithm. Three main types of data elements can be described using the data format: external and fixed values, user-provided data, and results of computation. Schema supports the following DataElements.

Following are the different DataElements supported by the schema

* ChoiceDataElement : can be used when there is a pre-defined set of answers are available
* NumericDataElement : represents a number
* IntegerDataElement : represents an integer value
* MultiChoiceDataElement: can be used when there is a pre-defined set of answers and can have one or more answers.
* GlobalValue: similar to constants in any programming language that can be referred to elsewhere in the guideline. These are intended to be used to define threshold values or parameters in a linear regression.
* ComputedElement: effective when it comes to reusing the logic

### ChoiceDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
|  | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional) | xsd:integer | Suggested order in which this DataElement is displayed together with the other DataElements |
| 5 | Label | text | Choice data element label (prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the DataElement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g.: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the DataElement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | ChoiceInfo  Contains all the possible values for the DataElement, only one value can be selected for a choice data element ( for questions with multiple choice please use the MultiChoiceDataElement)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1 | Choice     |  |  |  |  | | --- | --- | --- | --- | | 9.1.1 | Value | xsd:token | Choice value | | 9.1.2 | Label | text | Choice label (how the choice is intended to be displayed for the user in the GUI) | | 9.1.3 | Hint (optional) | text | Further information on the choice which can be optional ( e.g.: as a tooltip) | | 9.1.4 | VoiceCommand (optional) | text | Voice command to select this choice as the value for the DataElement | | 9.1.5 | Default | "true" | "false" | Is this the default choice ( if no other choice selected, this will be the value for the DataElement) | | 9.1.6 | ReportText (optional) | text | Text to be inserted into the report when the DataElement value is being inserted into the report. | | | | |
| 10 | ImageMap (optional)  Includes a pointer to the image that can be displayed as an interactive choice/multi choice question. Areas of the images which radiologist click should select one of the given choices. Image must be provided within the assets of the module.   |  |  |  |  | | --- | --- | --- | --- | | 10.1 | imageElements | xsd:anyURI | Image url pointing to the actual image location | | 10.2 | Label(optional) | text | Image Label, text used to referring the image. | | 10.3 | DrawStyle (optional)  Draw style used in the image.   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1 | Outline(optional) | text | Default area outline color specified as hex code | | 10.3.2 | HoverFill(optional) | text | Default area fill color when hovering specified as hex code | | 10.3.3 | SelectedFill(optional) | text | Default area fill color when selected specified as hex code | | | | | 10.4 | Map   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.4.1 | Area  Specifies region of the image to be which when selected activates a choice automatically. This has same concept as html image map, refer : <http://www.w3schools.com/TAGS/tag_map.asp>   |  |  |  |  | | --- | --- | --- | --- | | 10.4.1.1 | Shape | "rect" | "poly" | "circle" | Supports three different shapes. | | 10.4.1.2 | Coords | text | Image map coordinates | | 10.4.1.3 | ChoiceValue | xsd:token | Choice value for this image map, which will activated when user clicks within the specified coordinates | | 10.4.1.4 | Outline(optional) | text | Area outline color specified as hex code, which overrides the default defined in draw style | | 10.4.1.5 | HoverFill(optional) | text | area fill color when hovering specified as hex code, which overrides the default defined in draw style | | 10.4.1.6 | SelectedFill(optional) | text | area fill color when selected specified as hex code, which overrides the default defined in draw style | | | | | | | |

#### Sample

<ChoiceDataElement Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <ChoiceInfo>  
 <Choice Default="true">  
 <Value>Value0</Value>  
 <Label>Label3</Label>  
 <Hint>Hint1</Hint>  
 <VoiceCommand>VoiceCommand1</VoiceCommand>  
 <ReportText>ReportText0</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value1</Value>  
 <Label>Label4</Label>  
 <Hint>Hint2</Hint>  
 <VoiceCommand>VoiceCommand2</VoiceCommand>  
 <ReportText>ReportText1</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value2</Value>  
 <Label>Label5</Label>  
 <Hint>Hint3</Hint>  
 <VoiceCommand>VoiceCommand3</VoiceCommand>  
 <ReportText>ReportText2</ReportText>  
 </Choice>  
 </ChoiceInfo>  
 <ImageMap>  
 <imageElements>http://www.url.com/</imageElements>  
 <Label>Label6</Label>  
 <DrawStyle Outline="Outline0" HoverFill="HoverFill0" SelectedFill="SelectedFill0"/>  
 <Map>  
 <Area Shape="rect" Coords="Coords0" ChoiceValue="ChoiceValue0" Outline="Outline1" HoverFill="HoverFill1" SelectedFill="SelectedFill1"/>  
 <Area Shape="rect" Coords="Coords1" ChoiceValue="ChoiceValue1" Outline="Outline2" HoverFill="HoverFill2" SelectedFill="SelectedFill2"/>  
 </Map>  
 </ImageMap>  
</ChoiceDataElement>

#### Real-world Sample

<ChoiceDataElement Id="observationCharacter" IsRequired="true" CdeId="RDE65" DisplaySequence="1">  
 <Label>Observation in high risk patient</Label>  
 <Hint> Observation : Area with imaging features that differ from those of adjacent liver  
 parenchyma \r\n high risk patient:in whom the incidence of HCC is sufficient to justify  
 screening or surveillance according to AASLD guidelines </Hint>  
 <Diagrams>  
 <Diagram>  
 <Location>observation.png</Location>  
 <Label>observation</Label>  
 </Diagram>  
 </Diagrams>  
  
 <VoiceCommand> Observation in high risk patient </VoiceCommand>  
 <ChoiceInfo>  
 <Choice>  
 <Value>treatedObservation</Value>  
 <Label>Treated observation</Label>  
 <Hint>An observation that has undergone loco-regional treatment</Hint>  
 </Choice>  
 <Choice>  
 <Value>definitelyBenign</Value>  
 <Label>Definitely benign</Label>  
 <Hint> Cyst Hemangioma Vascular anomaly Perfusion alteration Hepatic fat deposition or  
 sparing Hypertrophic pseudomass Confluent fibrosis Focal scar Observation that  
 spontaneously disappears at follow-up</Hint>  
 </Choice>  
 <Choice>  
 <Value>probablyBenign</Value>  
 <Label>Probably benign</Label>  
 <Hint>Probable benign entities (examples) Probable: Cyst Hemangioma Vascular anomaly  
 Perfusion alteration Hepatic fat deposition or sparing Hypertrophic pseudomass  
 Confluent fibrosis Focal scar LR-2 cirrhosis associated nodule </Hint>  
 </Choice>  
 <Choice>  
 <Value>notDefProbBenign</Value>  
 <Label>Neither definite nor probable benign</Label>  
 </Choice>  
 <Choice>  
 <Value>notspecificforhcc</Value>  
 <Label>Probable malignancy, not specific for HCC</Label>  
 <Hint>Observation is probably malignant, but imaging features are not specific for  
 HCC</Hint>  
 </Choice>  
 <Choice>  
 <Value>tumorInVein</Value>  
 <Label>Tumor in vein</Label>  
 <Hint>Presence of tumor in vein lumen.</Hint>  
 </Choice>  
 </ChoiceInfo>  
</ChoiceDataElement>

### NumericDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional) | xsd:integer | Suggested order in which this DataElement is displayed together with the other DataElements |
| 5 | Label | text | Numeric data element label (prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the DataElement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g.: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the DataElement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | Minimum(optional) | xsd:decimal | Minimum allowed value |
| 10 | Maximum(optional) | xsd:decimal | Maximum allowed value |

#### Sample

<NumericDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <Minimum>0</Minimum>  
 <Maximum>0</Maximum>  
</NumericDataElement>

#### Real-world Sample

<NumericDataElement Id=”diameter” IsRequired=”true” CdeId=”RDE81” DisplaySequence=”3”>  
 <Label>Diameter (mm)</Label>  
 <Hint>Size of the lesion (outer edge to outer edge) in mm</Hint>  
 <Diagrams>  
 <Diagram>  
 <Location>diameter1.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>diameter2.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>diameter3.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>diameter4.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>diameter5.png</Location>  
 <Label></Label>  
 </Diagram>  
 </Diagrams>  
 <Minimum>1</Minimum>  
</NumericDataElement>

### IntegerDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
|  | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | “true” | “false” | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional) | xsd:integer | Suggested order in which this DataElement is displayed together with the other DataElements |
| 5 | Label | text | IntegerDataElement label (prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the DataElement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g.: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the DataElement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | Minimum(optional) | xsd:decimal | Minimum allowed value |
| 10 | Maximum(optional) | xsd:decimal | Maximum allowed value |

#### Sample

<IntegerDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <Minimum>0</Minimum>  
 <Maximum>0</Maximum>  
</IntegerDataElement>

#### Real-world Sample

<IntegerDataElement Id="patientAge">

<Label>Age</Label>

</IntegerDataElement>

### GlobalValue

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | identifier |
| 2 | text |  | Value |

#### Sample

<GlobalValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000">  
</GlobalValue>

#### Real-world Sample

<GlobalValue Id="diameterSmall">10</GlobalValue>

### MultichoiceElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
|  | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional) | xsd:integer | Suggested order in which this DataElement is displayed together with the other DataElements |
| 5 | Label | text | Choice data element label (prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the DataElement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g.: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the DataElement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | ChoiceInfo  Contains all the possible values for the DataElement, only one value can be selected for a choice data element ( for questions with multiple choice please use the MultiChoiceDataElement)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1 | Choice     |  |  |  |  | | --- | --- | --- | --- | | 9.1.1 | Value | xsd:token | Choice value | | 9.1.2 | Label | text | Choice label (how the choice is intended to be displayed for the user in the GUI) | | 9.1.3 | Hint (optional) | text | Further information on the choice which can be optional ( e.g.: as a tooltip) | | 9.1.4 | VoiceCommand (optional) | text | Voice command to select this choice as the value for the DataElement | | 9.1.5 | Default | "true" | "false" | Is this the default choice ( if no other choice selected, this will be the value for the DataElement) | | 9.1.6 | ReportText (optional) | text | Text to be inserted into the report when the DataElement value is being inserted into the report. | | | | |
| 10 | ImageMap (optional)  Includes a pointer to the image that can be displayed as an interactive choice/multi choice question. Areas of the images which radiologist click should select one of the given choices. Image must be provided within the assets of the module.   |  |  |  |  | | --- | --- | --- | --- | | 10.1 | imageElements | xsd:anyURI | Image url pointing to the actual image location | | 10.2 | Label(optional) | text | Image Label, text used to referring the image. | | 10.3 | DrawStyle (optional)  Draw style used in the image.   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1 | Outline(optional) | text | Default area outline color specified as hex code | | 10.3.2 | HoverFill(optional) | text | Default area fill color when hovering specified as hex code | | 10.3.3 | SelectedFill(optional) | text | Default area fill color when selected specified as hex code | | | | | 10.4 | Map   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.4.1 | Area  Specifies region of the image to be which when selected activates a choice automatically. This has same concept as html image map, refer : <http://www.w3schools.com/TAGS/tag_map.asp>   |  |  |  |  | | --- | --- | --- | --- | | 10.4.1.1 | Shape | "rect" | "poly" | "circle" | Supports three different shapes. | | 10.4.1.2 | Coords | text | Image map coordinates | | 10.4.1.3 | ChoiceValue | xsd:token | Choice value for this image map, which will activated when user clicks within the specified coordinates | | 10.4.1.4 | Outline(optional) | text | Area outline color specified as hex code, which overrides the default defined in draw style | | 10.4.1.5 | HoverFill(optional) | text | area fill color when hovering specified as hex code, which overrides the default defined in draw style | | 10.4.1.6 | SelectedFill(optional) | text | area fill color when selected specified as hex code, which overrides the default defined in draw style | | | | | | | |

#### Sample

<MultiChoiceDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0"  
 IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <ChoiceInfo>  
 <Choice Default="true">  
 <Value>Value0</Value>  
 <Label>Label3</Label>  
 <Hint>Hint1</Hint>  
 <VoiceCommand>VoiceCommand1</VoiceCommand>  
 <ReportText>ReportText0</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value1</Value>  
 <Label>Label4</Label>  
 <Hint>Hint2</Hint>  
 <VoiceCommand>VoiceCommand2</VoiceCommand>  
 <ReportText>ReportText1</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value2</Value>  
 <Label>Label5</Label>  
 <Hint>Hint3</Hint>  
 <VoiceCommand>VoiceCommand3</VoiceCommand>  
 <ReportText>ReportText2</ReportText>  
 </Choice>  
 </ChoiceInfo>  
 <ImageMap>  
 <imageElements>http://www.url.com/</imageElements>  
 <Label>Label6</Label>  
 <DrawStyle Outline="Outline0" HoverFill="HoverFill0" SelectedFill="SelectedFill0"/>  
 <Map>  
 <Area Shape="rect" Coords="Coords0" ChoiceValue="ChoiceValue0" Outline="Outline1"  
 HoverFill="HoverFill1" SelectedFill="SelectedFill1"/>  
 <Area Shape="rect" Coords="Coords1" ChoiceValue="ChoiceValue1" Outline="Outline2"  
 HoverFill="HoverFill2" SelectedFill="SelectedFill2"/>  
 </Map>  
 </ImageMap>  
</MultiChoiceDataElement>

#### Real-world Sample

<MultiChoiceDataElement Id="ancillaryFavoringMalignancy" DisplaySequence="7">  
 <Label>Are there Ancillary features favoring malignancy? </Label>  
 <Hint>Imaging features that modify likelihood of HCC. In isolation, these features do not permit reliable categorization of observations and hence are considered ancillary.</Hint>  
 <Diagrams>  
 <Diagram>  
 <Location>AF\_favoringMal1.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>AF\_favoringMal2.png</Location>  
 <Label></Label>  
 </Diagram>  
 <Diagram>  
 <Location>AF\_favoringMal3.png</Location>  
 <Label></Label>  
 </Diagram>  
 </Diagrams>  
 <ChoiceInfo>  
 <Choice>  
 <Value>Hepatobiliaryphasehypointensity</Value>  
 <Label>Hepatobiliary phase hypointensity</Label>  
 <Hint>Intensity in the hepatobiliary phase that unequivocally is less than that of the surrounding liver</Hint>  
 <ReportText>Hepatobiliary phase hypointensity</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Transitionalphasehypointensity</Value>  
 <Label>Transitional phase hypointensity</Label>  
 <Hint> Intensity in the transitional phase that unequivocally is less than that of the surrounding liver</Hint>  
 <ReportText>Transitional phase hypointensity</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Mild-moderateT2hyperintensity</Value>  
 <Label>Mild-moderate T2 hyperintensity</Label>  
 <Hint>Having mildly or moderately higher signal intensity on T2w images than liver.</Hint>  
 <ReportText>Mild-moderate T2 hyperintensity</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Restricteddiffusion</Value>  
 <Label>Restricted diffusion</Label>  
 <ReportText>Restricted diffusion</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Distinctiverim</Value>  
 <Label>Distinctive rim</Label>  
 <Hint>Features that specifically favor HCC as opposed to malignancy in general</Hint>  
 <ReportText>Distinctive rim</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Coronaenhancement</Value>  
 <Label>Coronaenhancement</Label>  
 <Hint>Zone or rim of peri-observation enhancement in the late arterial phase or early portal venous phase occurring after rapid dissipation of contrast material from an arterial phase hyperenhancing mass.</Hint>  
 <ReportText>Coronaenhancement</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Mosaicarchitecture</Value>  
 <Label>Mosaic architecture</Label>  
 <Hint>Observation that appears to consist of nodules or compartments with differing appearances (enhancement, attenuation, intensity). This term can also be applied to lesions with internal enhancing septations. The nodules, compartments, or septations appear randomly distributed within the observation.</Hint>  
 <ReportText>Mosaic architecture</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Nodule-in-nodulearchitecture</Value>  
 <Label>Nodule-in-nodulearchitecture</Label>  
 <Hint>One or more nodular or nodule-like observations within a larger nodular or nodular-like observation. </Hint>  
 <ReportText>Nodule-in-nodulearchitecture</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Intra-lesionalfat</Value>  
 <Label>Intra-lesional fat</Label>  
 <Hint>Presence of lipid in higher concentration within a mass than in background reference tissue (e.g. liver).</Hint>  
 <ReportText>Intra-lesional fat</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Lesionalironsparing</Value>  
 <Label>Lesional iron sparing</Label>  
 <Hint>Relative paucity of iron in a solid mass compared to that of background reference tissue (e.g. iron-overloaded liver).</Hint>  
 <ReportText>Lesional iron sparing</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Lesionalfatsparing</Value>  
 <Label>Lesional fat sparing</Label>  
 <Hint>Relative paucity of fat in solid mass compared to that of background reference tissue (e.g. fatty liver).</Hint>  
 <ReportText>Lesional fat sparing</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Bloodproducts</Value>  
 <Label>Blood products</Label>  
 <Hint>Presence of intra-lesional or peri-lesional hemorrhage in absence of biopsy, trauma or intervention.</Hint>  
 <ReportText>Blood products</ReportText>  
 </Choice>  
 <Choice>  
 <Value>Diameter increaselessthanthresholdgrowth</Value>  
 <Label>Diameter increase less than threshold growth</Label>  
 <Hint>Unequivocal increase in the diameter of an observation, measured on examinations performed on different dates, which is not attributable to artifact, differences in technique between the two examinations, or measurement error.</Hint>  
 <ReportText>Diameter increase less than threshold growth</ReportText>  
 </Choice>  
 </ChoiceInfo>  
 </MultiChoiceDataElement>

### ComputedElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | DisplaySequence(optional) | |  | | --- | | xsd:integer | | Suggested order in which this DataElement is displayed together with the other DataElements |
| 3 | ShowValue(optional) | xsd:boolean | If true, then the computed value of the ComputedElement should be displayed in the interface of the reporting framework. |
| 4 | Label(optional) | Text | Computed data element label |
| 5 | Hint(optional) | text | Optionally displayed more detailed text for the user describing more details about the DataElement. |
| 6 | Diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g.: illustrations of how the measurements are to be taken   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 6.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 6.1.1 | Location | text | Image location | | 6.1.2 | Label | text | Image Label | | 6.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the DataElement contains more than one diagram | | 6.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 7 | ArithmeticExpression | text | Arithmetic expression which will be evaluated to produce the output. This can include values from other DataElement, basic arithmetic operators, many core mathematical functions |
| 8 | TextExpression  Text expression is the desired computed output value of the computed DataElement, which can include reference to other DataElements.   |  |  |  |  | | --- | --- | --- | --- | | 8.1 | text |  | Text Expression. | | 8.2 | InsertValue  Can be used to insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 8.2.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 8.2.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | | | | |
| 9 | DecisionPoint  Text expression can be written as simple text expression, which will be returned as the value of the computed element. It is also possible to insert any Dataelement value in the expression. Contains different Braches each meets a unique condition.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1 | Branch  ConditionType  Below are the possible conditions in a branch. Condition type enable comparing DataElements to one another to fixed values, operators allows combination of conditions itself   |  |  |  |  | | --- | --- | --- | --- | | 9.1.1 | AndCondition |  | It contains conditions if all of those evaluate to true then it evaluates to true | | 9.1.2 | OrCondition |  | It contains conditions if any of those evaluate to true then it evaluates to true | | 9.1.3 | NotCondition |  | It contains conditions if all of those evaluate to false then it evaluates to true. | | 9.1.4 | EqualCondition  Compare a data element to a given value and evaluated to “true” if they are equal  comparisonConditionContents   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.4.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 9.1.4.1.1 | DataElementId | xsd:IDREF | DataElementId to be compared | | | | | 9.1.4.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 9.1.5 | GreaterThanCondition  Checks whether DataElement value is greater than given value and evaluated to “true” if so.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.5.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 9.1.5.1.1 | DataElementId | xsd:IDREF | DataElementId to be compared | | | | | 9.1.5.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 9.1.6 | LessThanCondition  Checks whether DataElement value is lesser than given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.6.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 9.1.6.1.1 | DataElementId | xsd:IDREF | DataElementId to be compared | | | | | 9.1.6.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 9.1.7 | GreaterThanOrEqualsCondition  Checks whether DataElement value is greater than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.7.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 9.1.7.1.1 | DataElementId | xsd:IDREF | DataElementId to be compared | | | | | 9.1.7.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 9.1.8 | LessThanOrEqualsCondition  Checks whether DataElement value is lesser than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.8.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 9.1.8.1.1 | DataElementId | xsd:IDREF | DataElementId to be compared | | | | | 9.1.8.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 9.1.9 | ContainsCondition  Checks whether any part of the DataElement matches with the given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.9.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 9.1.9.1.1 | DataElementId | xsd:IDREF | DataElementId to be checked | | | | | 9.1.9.2 | ComparisonValue | xsd:token | Comparison value. Could be a constant value. | | | | | 9.1.10 | HasAnyNChoicesCondition  This can be used to compare the number of choices selected from a MultiChoice DataElement and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1.10.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 9.1.10.1.1 | DataElementId | xsd:IDREF | MultiChoice DataElementId to be checked | | | | | 9.1.10.2 | MinimumChoices | xsd:positiveInteger | Constant value which can be compared with the number of choices selected. | | | | | | 9.2 | Recursive. Can be ArithmeticExpression, TextExpression or DecisionPoint | | | |
| 10 | DefaultBranch  Recursive. Can be ArithmeticExpression, TextExpression or DecisionPoint | | |

#### Sample:

<ComputedElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" DisplaySequence="50" ShowValue="false">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <DecisionPoint>  
 <Branch>  
 <AndCondition>  
 <LessThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue0"/>  
 <NotCondition>  
 </NotCondition>  
 <GreaterThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue1"/>  
 </AndCondition>  
 <DecisionPoint/>  
 </Branch>  
 <Branch>  
 <LessThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue2"/>  
 <DecisionPoint/>  
 </Branch>  
 <DefaultBranch>  
 <ArithmeticExpression>ArithmeticExpression0</ArithmeticExpression>  
 </DefaultBranch>  
 </DecisionPoint>  
</ComputedElement>

#### Real-world Sample

<ComputedElement Id="washoutcapsulethreshold">  
 <DecisionPoint>  
 <Branch>  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth" ComparisonValue="no"/>  
 </AndCondition>  
 <TextExpression>None</TextExpression>  
 </Branch>  
 <Branch>  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="yes"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth" ComparisonValue="no"/>  
 </AndCondition>  
   
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth" ComparisonValue="no"/>  
 </AndCondition>  
   
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth" ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <TextExpression>One</TextExpression>  
 </Branch>  
 <DefaultBranch>  
 <TextExpression>twoormore</TextExpression>  
 </DefaultBranch>  
 </DecisionPoint>  
</ComputedElement>

<ComputedElement Id="famHxLungCancerFactor">  
 <DecisionPoint>  
 <Branch>  
 <EqualCondition DataElementId="famHxLungCancer" ComparisonValue="true"/>  
 <ArithmeticExpression>0.2961</ArithmeticExpression>  
 </Branch>  
 <DefaultBranch>  
 <ArithmeticExpression>0</ArithmeticExpression>  
 </DefaultBranch>  
 </DecisionPoint>  
</ComputedElement>

## Rules

The Rules section consists of a root DecisionPoint element containing multiple Branch elements, each of which consists of a condition which if true leads to a DecisionPoint element or to an EndPointRef element.

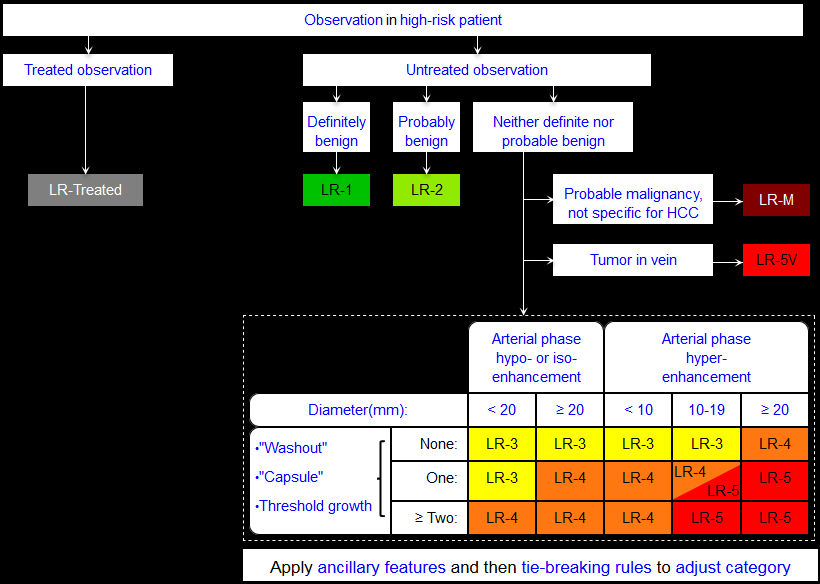
|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Label | text | Decision point label. |
| 2 | Description(optional) | text | Decision point description |
| 3 | Branch  A branch either ends on an endpoint or on a decision point. The decision point can contain one more branches based on different conditions.   |  |  |  |  | | --- | --- | --- | --- | | 3.1 | Label(optional) | text |  | | 3.2 | NotRelevantDataElements(optional)  This property can be used to specify the list the data elements which are not relevant down this branch. It is suggested that NotRelevantDataElements been either deactivated or hide on this branch.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 3.2.1.1 | DataElementRef   |  |  |  |  | | --- | --- | --- | --- | | 3.2.1.1.1 | DataElementId | xsd:IDREF | Dataelement identifier which is no relevant | | | | | | 3.3 | AndCondition |  | It contains conditions if all of those evaluate to true then it evaluates to true | | 3.4 | OrCondition |  | It contains conditions if any of those evaluate to true then it evaluates to true | | 3.5 | NotCondition |  | It contains conditions if all of those evaluate to false then it evaluates to true. | | 3.6 | EqualCondition  Compare a data element to a given value and evaluated to “true” if they are equal   |  |  |  |  | | --- | --- | --- | --- | | 3.6.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.6.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.7 | GreaterThanCondition  Checks whether DataElement value is greater than given value and evaluated to “true” if so.   |  |  |  |  | | --- | --- | --- | --- | | 3.7.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.7.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.8 | LessThanCondition  Checks whether DataElement value is lesser than given value and evaluated to “true” if so     |  |  |  |  | | --- | --- | --- | --- | | 3.8.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.8.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.9 | GreaterThanOrEqualsCondition  Checks whether DataElement value is greater than or equal to given value and evaluated to “true” if so   |  |  |  |  | | --- | --- | --- | --- | | 3.9.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.9.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.10 | LessThanOrEqualsCondition  Checks whether DataElement value is lesser than or equal to given value and evaluated to “true” if so   |  |  |  |  | | --- | --- | --- | --- | | 3.10.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.10  .2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.11 | ContainsCondition  Checks whether any part of the DataElement matches with the given value and evaluated to “true” if so   |  |  |  |  | | --- | --- | --- | --- | | 3.11.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.11  .2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.12 | HasAnyNChoicesCondition  This can be used to compare the number of choices selected from a MultiChoice DataElement and evaluated to “true” if so   |  |  |  |  | | --- | --- | --- | --- | | 3.12.1 | DataElementId | xsd:IDREF | DataElementId to be compared. | | 3.12  .2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a DataElement or a constant value. | | | | | 3.13 | EndpointRef  Reference to the endpoint which is the output of the rule set.   |  |  |  |  | | --- | --- | --- | --- | | 3.13.1 | EndPointId | xsd:IDREF | The endpoint id reference. | | 3.13.2 | Label(optional) | text | Endpoint reference label, which can be used in reference documentation and/or graphical representations. | | 3.13.3 | Description(optional) | text | Endpoint reference description | | | | | 3.14 | DecisionPoint  Recursive, starts another DecisionPoint | | | | | |
| 4 | DefaultBranch(optional)  Default branch if no other branch in the decision point that evaluates to true   |  |  |  |  | | --- | --- | --- | --- | | 4.1 | Label(optional) | text | Default branch label, which can be used in reference documentation and/or graphical representations. | | 4.2 | NotRelevantDataElements(optional)  This property can be used to specify the list the data elements which are not relevant down this branch. It is suggested that nonrelevantDataElements been either deactivated or hide on this branch.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 4.2.1. | DataElementRef   |  |  |  |  | | --- | --- | --- | --- | | 4.2.1.1 | DataElementId | xsd:IDREF | DataElementId which is not relevant | | | | | | 4.3 | EndpointRef  Reference to the endpoint which is the output of the rule set   |  |  |  |  | | --- | --- | --- | --- | | 4.3.1 | EndPointId | xsd:IDREF | The endpoint id reference. | | 4.3.2 | Label(optional) | text | Endpoint reference label, which can be used in reference documentation and/or graphical representations | | 4.3.3 | Description(optional) | text | Endpoint reference description | | | | | 4.4 | DecisionPoint  Recursive, starts another DecisionPoint | | | | | |

### Sample

<Rules >  
 <DecisionPoint>  
 <Label>Label0</Label>  
 <Description>Description0</Description>  
 <Branch>  
 <Label>Label1</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID000"/>  
 <DataElementRef DataElementId="ID001"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="ID002" ComparisonValue="ComparisonValue0"/>  
 <DecisionPoint/>  
 </Branch>  
 <Branch>  
 <Label>Label2</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID003"/>  
 <DataElementRef DataElementId="ID004"/>  
 </NotRelevantDataElements>  
 <OrCondition>  
 <AndCondition> </AndCondition>  
 <GreaterThanOrEqualsCondition DataElementId="ID005"  
 ComparisonValue="ComparisonValue1"/>  
 <ContainsCondition DataElementId="ID006" ComparisonValue="ComparisonValue2"/>  
 </OrCondition>  
 <DecisionPoint/>  
 </Branch>  
 <DefaultBranch>  
 <Label>Label3</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID007"/>  
 <DataElementRef DataElementId="ID008"/>  
 </NotRelevantDataElements>  
 <DecisionPoint/>  
 </DefaultBranch>  
 </DecisionPoint>  
</Rules>

### Real-world Sample

Hello\_RADs diagram and its Rules section representation.



<Rules>  
 <DecisionPoint>  
 <Label>Observation character</Label>  
 <Branch>  
 <Label>Treated Observation</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="diameter"/>  
 <DataElementRef DataElementId="arterialEnhancement"/>  
 <DataElementRef DataElementId="washout"/>  
 <DataElementRef DataElementId="capsule"/>  
 <DataElementRef DataElementId="thresholdgrowth"/>  
 <DataElementRef DataElementId="ancillaryFavoringMalignancy"/>  
 <DataElementRef DataElementId="ancillaryFavoringBenignity"/>  
 <DataElementRef DataElementId="adjustcategorybasedonAncillary"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="observationCharacter"  
 ComparisonValue="treatedObservation"/>  
 <EndPointRef EndPointId="hcctreatedEp"/>  
 </Branch>  
 <Branch>  
 <Label>Definitely Benign</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="diameter"/>  
 <DataElementRef DataElementId="arterialEnhancement"/>  
 <DataElementRef DataElementId="washout"/>  
 <DataElementRef DataElementId="capsule"/>  
 <DataElementRef DataElementId="thresholdgrowth"/>  
 <DataElementRef DataElementId="ancillaryFavoringMalignancy"/>  
 <DataElementRef DataElementId="ancillaryFavoringBenignity"/>  
 <DataElementRef DataElementId="adjustcategorybasedonAncillary"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="observationCharacter" ComparisonValue="definitelyBenign"/>  
 <EndPointRef EndPointId="hcc1Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Probably Benign</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="diameter"/>  
 <DataElementRef DataElementId="arterialEnhancement"/>  
 <DataElementRef DataElementId="washout"/>  
 <DataElementRef DataElementId="capsule"/>  
 <DataElementRef DataElementId="thresholdgrowth"/>  
 <DataElementRef DataElementId="ancillaryFavoringMalignancy"/>  
 <DataElementRef DataElementId="ancillaryFavoringBenignity"/>  
 <DataElementRef DataElementId="adjustcategorybasedonAncillary"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="observationCharacter" ComparisonValue="probablyBenign"/>  
 <EndPointRef EndPointId="hcc2Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Probable malignancy, not specific for HCC</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="diameter"/>  
 <DataElementRef DataElementId="arterialEnhancement"/>  
 <DataElementRef DataElementId="washout"/>  
 <DataElementRef DataElementId="capsule"/>  
 <DataElementRef DataElementId="thresholdgrowth"/>  
 <DataElementRef DataElementId="ancillaryFavoringMalignancy"/>  
 <DataElementRef DataElementId="ancillaryFavoringBenignity"/>  
 <DataElementRef DataElementId="adjustcategorybasedonAncillary"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="observationCharacter" ComparisonValue="notspecificforhcc"/>  
 <EndPointRef EndPointId="hccmEp"/>  
 </Branch>  
 <Branch>  
 <Label>Tumor in vein</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="diameter"/>  
 <DataElementRef DataElementId="arterialEnhancement"/>  
 <DataElementRef DataElementId="washout"/>  
 <DataElementRef DataElementId="capsule"/>  
 <DataElementRef DataElementId="thresholdgrowth"/>  
 <DataElementRef DataElementId="ancillaryFavoringMalignancy"/>  
 <DataElementRef DataElementId="ancillaryFavoringBenignity"/>  
 <DataElementRef DataElementId="adjustcategorybasedonAncillary"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="observationCharacter" ComparisonValue="tumorInVein"/>  
 <EndPointRef EndPointId="hcc5vEp"/>  
 </Branch>  
 <Branch>  
 <Label>Neither definite nor probable benign</Label>  
 <AndCondition>  
 <EqualCondition DataElementId="observationCharacter"  
 ComparisonValue="notDefProbBenign"/>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary" ComparisonValue="No"  
 />  
 </AndCondition>  
 <DecisionPoint>  
 <Label>Arterial phase enhancement</Label>  
 <Branch>  
 <Label>Hyper-enhancement</Label>  
 <!-- Hyper-enhancement -->  
 <EqualCondition DataElementId="arterialEnhancement"  
 ComparisonValue="hyperEnhancing"/>  
 <DecisionPoint>  
 <Label>Diameter</Label>  
 <Branch>  
 <Label>&lt; 10</Label>  
 <!-- Diameter < 10 -->  
 <LessThanCondition DataElementId="diameter"  
 ComparisonValue="diameterSmall"/>  
 <DecisionPoint>  
 <Label>Washout/Capsule/Thresholdgrowth</Label>  
 <Branch>  
 <Label>None</Label>  
 <!-- None / Zero Y's -->  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <Label>One</Label>  
 <!-- One / One Y -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Two or More</Label>  
 <!-- Two / Two or more Y's -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 <Branch>  
 <Label>10-19</Label>  
 <!-- 10 <= Diameter <= 19 -->  
 <AndCondition>  
 <GreaterThanOrEqualsCondition DataElementId="diameter"  
 ComparisonValue="diameterSmall"/>  
 <LessThanOrEqualsCondition DataElementId="diameter"  
 ComparisonValue="19"/>  
 </AndCondition>  
 <DecisionPoint>  
 <Label>Washout/Capsule/Thresholdgrowth</Label>  
 <Branch>  
 <Label>None</Label>  
 <!-- None / Zero Y's -->  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <Label>One</Label>  
 <!-- One / One Y -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4\_5"/>  
 </Branch>  
 <Branch>  
 <Label>Two or More</Label>  
 <!-- Two / Two or more Y's -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc5Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 <Branch>  
 <Label>&gt;= 20</Label>  
 <!-- Diameter >= 20 -->  
 <GreaterThanOrEqualsCondition DataElementId="diameter"  
 ComparisonValue="diameterLarge"/>  
 <DecisionPoint>  
 <Label>Washout/Capsule/Thresholdgrowth</Label>  
 <Branch>  
 <Label>None</Label>  
 <!-- None / Zero Y's -->  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 <Branch>  
 <Label>One</Label>  
 <!-- One / One Y -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc5Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Two or More</Label>  
 <!-- Two / Two or more Y's -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc5Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 <Branch>  
 <Label>Hypo/Iso-enhancing</Label>  
 <!-- Hypo/Iso-enhancement -->  
 <OrCondition>  
 <EqualCondition DataElementId="arterialEnhancement"  
 ComparisonValue="hypoEnhancing"/>  
 <EqualCondition DataElementId="arterialEnhancement"  
 ComparisonValue="isoEnhancing"/>  
 </OrCondition>  
 <DecisionPoint>  
 <Label>Diameter</Label>  
 <Branch>  
 <Label>&lt; 20</Label>  
 <!-- Diameter < 20 -->  
 <LessThanCondition DataElementId="diameter"  
 ComparisonValue="diameterLarge"/>  
 <DecisionPoint>  
 <Label>Washout/Capsule/Thresholdgrowth</Label>  
 <Branch>  
 <Label>None</Label>  
 <!-- None / Zero Y's -->  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <Label>One</Label>  
 <!-- One / One Y -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Two or More</Label>  
 <!-- Two / Two or more Y's -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 <Branch>  
 <Label>&gt;= 20</Label>  
 <!-- Diameter >= 20 -->  
 <GreaterThanOrEqualsCondition DataElementId="diameter"  
 ComparisonValue="diameterLarge"/>  
 <DecisionPoint>  
 <Label>Washout/Capsule/Thresholdgrowth</Label>  
 <Branch>  
 <Label>None</Label>  
 <!-- None / Zero Y's -->  
 <AndCondition>  
 <EqualCondition DataElementId="washout" ComparisonValue="no"/>  
 <EqualCondition DataElementId="capsule" ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <Label>One</Label>  
 <!-- One / One Y -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 <Branch>  
 <Label>Two or More</Label>  
 <!-- Two / Two or more Y's -->  
 <OrCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="no"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="no"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="no"/>  
 <!-- Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 <AndCondition>  
 <EqualCondition DataElementId="washout"  
 ComparisonValue="yes"/>  
 <!-- Washout = Yes, Capsule = Yes, Thresholdgrowth = Yes -->  
 <EqualCondition DataElementId="capsule"  
 ComparisonValue="yes"/>  
 <EqualCondition DataElementId="thresholdgrowth"  
 ComparisonValue="yes"/>  
 </AndCondition>  
 </OrCondition>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 <Branch>  
 <Label>Adjust category</Label>  
 <AndCondition>  
 <NotCondition>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="No"/>  
 </NotCondition>  
 <EqualCondition DataElementId="observationCharacter"  
 ComparisonValue="notDefProbBenign"/>  
 </AndCondition>  
 <DecisionPoint>  
 <Label>Adjust category</Label>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Upgradetohcc2"/>  
 <EndPointRef EndPointId="hcc2Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Upgradetohcc3"/>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Upgradetohcc4"/>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Downgradetohcc4"/>  
 <EndPointRef EndPointId="hcc4Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Downgradetohcc3"/>  
 <EndPointRef EndPointId="hcc3Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Downgradetohcc2"/>  
 <EndPointRef EndPointId="hcc2Ep"/>  
 </Branch>  
 <Branch>  
 <EqualCondition DataElementId="adjustcategorybasedonAncillary"  
 ComparisonValue="Downgradetohcc1"/>  
 <EndPointRef EndPointId="hcc1Ep"/>  
 </Branch>  
 </DecisionPoint>  
 </Branch>  
 </DecisionPoint>  
</Rules>

## Endpoints

This section contains all the defined endpoints together with the reusable text fragments (TemplatePartial elements). Each EndPoint element specifies the repot text to be inserted and other actions to be taken when the logic tree leads to a particular endpoint.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | TemplatePartial  TemplatePartial elements define a reusable text fragment or macro that once defined can be repeatedly used in all endpoints.   |  |  |  |  | | --- | --- | --- | --- | | 1.1 | id | xsd:id | Template partial identifier, which can be referred in the report text | | 1.2 | Template definition includes the text mixed with the template elements as described below.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.1 | text |  |  | | 1.2.2 | InsertValue  Insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.1.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 1.2.2.1.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | | | 1.2.2 | InsertPartial  Insert the contents of a TemplatePartial to be inserted   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.2.1 | PartialId | xsd:IDREF | The dynamic value of this TemplatePartial will be inserted. | | | | | 1.2.2.3 | SectionIf  Insert the contained template text if the given DataElement has any value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.3.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.3.2 | Recursive from 1.2 | | | | | | | 1.2.2.4 | SectionIfValue  Insert the contained template text if the given DataElement matches with the comparison value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.4.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.4.2 | ComparisonValue | xsd:token | Comparison value | | 1.2.2.4.3 | Recursive from 1.2 | | | | | | | 1.2.2.5 | SectionIfNot  Insert the contained template text if the given DataElement has no value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.5.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.5.2 | Recursive from 1.2 | | | | | | | 1.2.2.6 | SectionIfValueNot  Insert the contained template text if the given DataElement doesn’t matches with the comparison value   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.6.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.6.2 | ComparisonValue | xsd:token | Comparison value | | 1.2.2.6.3 | Recursive from 1.2 | | | | | | | | | | | |
| 2 | Endpoint     |  |  |  |  | | --- | --- | --- | --- | | 2.1 | Id | xsd:ID | Endpoint identifier. This will be referred to be in the logic tree. | | 2.2 | Label  (optional) | text | Brief summary of the endpoints to be used in the documentation and in diagrams | | 2.3 | Diagnosis(optional)  can contain one or more diagnosis   |  |  |  |  | | --- | --- | --- | --- | | 2.3.1.1 | CodingSystem  (optional) | text | The source of coding system used. This should be a URL | | 2.3.1.2 | Code | xsd:token | Code in coding system | | | | | 2.4 | ReportTexts  Specifies blocks of text to be inserted in the report at various points. Can have one or more ReportText  ReportText   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 2.4.1 | | SectionId  Specifies texts to be inserted at different points in the report. The supported sections are listed below   |  |  |  |  | | --- | --- | --- | --- | | 2.4.1.1 | SectionId | "findings" | "impression" | "recommendation" | "impressionRecommendation" | "citation" | **Findings**: Text to be inserted into the body of the report, typically at the point where the radiologist is currently working  **Impression**: Text to be inserted into the impression section of the report, typically at the bottom of the report  **Recommendation**: Text to be inserted into a recommendation section of a report, if applicable  **ImpressionRecommendation**: When a recommendation section is not available, text which includes a recommendation to be inserted into the impression section of the report.  **Citation**: Text to be added at the bottom of a report which provides citation information about the recommendations. See also the “Citation” tag in the Metadata section; the text in this tag should be inserted in place of that global citation when given for a particular EndPoint. | | | | | | 2.4.2 | text | |  |  | | 2.4.3 | InsertValue  Insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 2.4.3.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 2.4.3.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | | | | | 2.4.4 | InsertPartial  Insert the contents of a TemplatePartial to be inserted   |  |  |  |  | | --- | --- | --- | --- | | 2.4.4.1 | PartialId | xsd:IDREF | The dynamic value of this TemplatePartial will be inserted. | | | | | | | 2.4.5 | SectionIf  Insert the contained template text if the given DataElement has any value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.5.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.5.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | 2.4.6 | SectionIfValue  Insert the contained template text if the given DataElement matches with the comparison value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.6.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.6.2 | ComparisonValue | xsd:token | Comparison value | | 2.4.6.3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | 2.4.7 | SectionIfNot  Insert the contained template text if the given DataElement has no value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.7.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.7.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | 2.4.8 | SectionIfValueNot  Insert the contained template text if the given DataElement doesn’t matches with the comparison value   |  |  |  |  | | --- | --- | --- | --- | | 2.4.8.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.8.2 | ComparisonValue | xsd:token | Comparison value | | 2.4.8  .3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | | | | 2.5. | ActionableFinding(optional)   |  |  |  |  | | --- | --- | --- | --- | | 2.5.1 | Category | text |  | | | | | 2.6 | ImagingFollowup(optional)  Specifies the parameters around recommended imaging follow-up   |  |  |  |  | | --- | --- | --- | --- | | 2.6.1 | ClinicalCondition | text | If the recommended follow-up has a clinical condition such as a patient has high risk for cancer | | 2.6.2 | References(optional)  Reference to the evidence base for the recommendation.  Citation   |  |  |  |  | | --- | --- | --- | --- | | 2.6.2.1 | PubmedId (optional) | xsd:token | Pubmed reference Identifier  <https://www.ncbi.nlm.nih.gov/pubmed> | | 2.6.2.2 | URI (optional) | xsd:anyURI | Any Reference URI (for e.g.: link to abstract on journal website) | | 2.6.2.3 | Text |  | citation text ( for e.g. : a bibliographic reference to the citation) | | | | | 2.6.3 | EvidenceLevel  Contains information to encode the strength of the evidence behind the recommendation   |  |  |  |  | | --- | --- | --- | --- | | 2.6.3.1 | CodingSystem | text | The source of coding system used. This should be a URL | | 2.6.3.2 | Code | xsd:token | Code in coding system | | 2.6.3.3 | xsd:token |  |  | | | | | 2.6.4 | PreferredImagingExam  For the recommended imaging follow-up, the exam that would be the first choice.   |  |  |  |  | | --- | --- | --- | --- | | 2.6.4.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | |  | Code | xsd:token | Code in coding system | | | | | 2.6.5 | AcceptableImagingExams  For the recommended imaging follow-up the other exams that would satisfy the recommendation.  Exam   |  |  |  |  | | --- | --- | --- | --- | | 2.6.5.1 | code | text | Code in coding system | | 2.6.5.2 | CodeSystem | text | The source of coding system used. This should be a URL | | 2.6.5.3 | Modality | text | modality | | 2.6.5.4 | BodyRegion | text | Body region | | 2.6.5.5 | text |  |  | | | | | 2.6.6 | IndicationForFollowup  The encoding of the indication or reason for the follow-up imaging exam.   |  |  |  |  | | --- | --- | --- | --- | | 2.6.6.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | | 2.6.6.2 | Code | xsd:token | Code in coding system | | 2.6.6.3 | text |  |  | | | | | 2.6.7 | RecommendedTimeFrame  Recommended time frame for the preferred next exam.   |  |  |  |  | | --- | --- | --- | --- | | 2.6.7.1 | Earliest | Xsd:duration | Earliest time relative to the exam date time. Following is the example to mention the earliest time based on xsd:duration definition  “P5Y2M10DT15H” | | 2.6.7.2 | Latest | Xsd:duration | Latest time relative to the exam date time. Following is the example to mention the latest time based on xsd:duration definition  “P5Y2M10DT15H” | | 2.6.7.3 | empty |  |  | | | | | | | | | |

### Sample

<EndPoint xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000">  
 <Label>Label0</Label>  
 <Diagnosis CodingSystem="CodingSystem0" Code="Code0">  
 </Diagnosis>  
 <ReportTexts>  
 <ReportText SectionId="findings">  
 <SectionIf DataElementId="ID000">  
 </SectionIf>  
 <SectionIfValueNot DataElementId="ID000" ComparisonValue="ComparisonValue0">  
 </SectionIfValueNot>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <SectionIfValue DataElementId="ID000" ComparisonValue="ComparisonValue1">  
 </SectionIfValue>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <SectionIfNot DataElementId="ID000">  
 </SectionIfNot>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 </ReportTexts>  
 <ActionableFinding Category="Category0"/>  
 <ImagingFollowup>  
 <Exam Code="Code1" CodeSystem="CodeSystem0" Modality="Modality0" BodyRegion="BodyRegion0">  
 </Exam>  
 <Exam Code="Code2" CodeSystem="CodeSystem1" Modality="Modality1" BodyRegion="BodyRegion1">  
 </Exam>  
 </ImagingFollowup>  
</EndPoint>

### Real-world Sample

<EndPoint Id="cysticBosniak2f">  
 <Label>6-month follow-up</Label>  
 <ReportTexts>  
 <ReportText SectionId="findings">A <InsertValue DataElementId="size"/> mm cystic-appearing  
 lesion in the <InsertPartial PartialId="locationSideText"/>  
 <InsertPartial PartialId="seriesImageIncludeHas"/> imaging features consistent with  
 Bosniak Category IIF.</ReportText>  
 <ReportText SectionId="impression">A cystic-appearing <InsertValue DataElementId="side"/>  
 renal lesion measuring <InsertValue DataElementId="size"/> mm is indeterminate for  
 neoplasm. Follow-up CT or MRI beginning in 6 months is recommended, depending on  
 co-morbidities or limited life expectancy.</ReportText>  
 <ReportText SectionId="recommendation">Follow-up CT or MRI in 6 months is recommended. Note  
 that imaging follow-up may not be clinically appropriate for patients with limited life  
 expectancy and/or co-morbidities that increase the risk of treatment.</ReportText>  
 <ReportText SectionId="impressionRecommendation">A cystic-appearing <InsertValue  
 DataElementId="side"/> renal lesion measuring <InsertValue DataElementId="size"/> mm  
 is indeterminate for neoplasm. Follow-up CT or MRI beginning in 6 months is recommended,  
 depending on co-morbidities or limited life expectancy.</ReportText>  
 </ReportTexts>  
 <ActionableFinding Category="3"/>  
 <ImagingFollowup>  
 <PreferredImagingExam Code="RPID4">CT ABD WO &amp; W IVCON</PreferredImagingExam>  
 <AcceptableImagingExams>  
 <Exam Code="RPID473">MR ABDOMEN WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID474">MR ABDOMEN WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID537">MR ABDOMEN RETROPERITONEUM WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID554">MR ABDOMEN ANGIOGRAPHY WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID555">MR ABDOMEN ANGIOGRAPHY WITH IV CONTRAST</Exam>  
 <Exam Code="RPID598">MR ABDOMEN</Exam>  
 <Exam Code="RPID608">MR ABDOMEN PELVIS WITH IV CONTRAST</Exam>  
 <Exam Code="RPID609">MR ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID628">MR ABDOMEN CHOLANGIOGRAPHY</Exam>  
 <Exam Code="RPID644">MR ABDOMEN PELVIS ENTEROGRAPHY</Exam>  
 <Exam Code="RPID645">MR ABDOMEN PELVIS ENTEROGRAPHY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID767">MR CHEST ABDOMEN PELVIS</Exam>  
 <Exam Code="RPID768">MR CHEST ABDOMEN PELVIS WITH IV CONTRAST</Exam>  
 <Exam Code="RPID769">MR CHEST ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID837">MR ABDOMEN PELVIS</Exam>  
 <Exam Code="RPID1571">MR ABDOMEN ADRENAL WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1572">MR ABDOMEN ADRENAL WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID1612">MR ABDOMEN LIVER WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1613">MR ABDOMEN LIVER WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID1621">MR ABDOMEN PANCREAS WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1622">MR ABDOMEN PANCREAS WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID1631">MR ABDOMEN KIDNEY WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1632">MR ABDOMEN KIDNEY WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID1633">MR ABDOMEN KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID2211">MR ABDOMEN LIVER</Exam>  
 <Exam Code="RPID5767">MR ABDOMEN LIVER WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID5768">MR ABDOMEN LIVER PANCREAS WITHOUT IV CONTRAST</Exam>  
 <Exam Code="RPID5769">MR ABDOMEN LIVER PANCREAS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID5770">MR ABDOMEN PANCREAS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID54">CT ABDOMEN PELVIS UROGRAPHY</Exam>  
 <Exam Code="RPID164">CT ABDOMEN PELVIS UROGRAPHY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID198">CT ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID250">CT CHEST ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID252">CT CHEST ABDOMEN WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID387">CT ABDOMEN KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID389">CT ABDOMEN ADRENAL WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID401">CT ABDOMEN MULTIPHASE LIVER POST OP WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID406">CT ABDOMEN MULTIPHASE LIVER WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID407">CT ABDOMEN MULTIPHASE PANCREAS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID423">CT ABDOMEN LIVER POST OP WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID890">CT ABDOMEN KIDNEY</Exam>  
 <Exam Code="RPID892">CT ABDOMEN KIDNEY WITH IV CONTRAST</Exam>  
 <Exam Code="RPID949">CT ABDOMEN PELVIS MULTIPHASE WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID953">CT ABDOMEN MULTIPHASE WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID954">CT ABDOMEN MULTIPHASE KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID955">CT ABDOMEN PELVIS MULTIPHASE KIDNEY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID956">CT ABDOMEN PELVIS MULTIPHASE LIVER WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID957">CT ABDOMEN PELVIS MULTIPHASE PANCREAS WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID959">CT ABDOMEN PANCREAS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID964">CT ABDOMEN PELVIS 3D IMAGING PROCESSING UROGRAPHY WITHOUT THEN WITH  
 IV CONTRAST</Exam>  
 <Exam Code="RPID973">CT ABDOMEN MULTIPHASE ADRENAL WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID998">CT CHEST ABDOMEN CORONARY ARTERIES WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1073">CT ABDOMEN MULTIPHASE PANCREAS DUAL ENERGY CT WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1076">CT ABDOMEN KIDNEY DUAL ENERGY CT WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1077">CT ABDOMEN MULTIPHASE KIDNEY DUAL ENERGY CT WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1079">CT ABDOMEN KIDNEY DUAL ENERGY CT</Exam>  
 <Exam Code="RPID1090">CT ABDOMEN PELVIS UROGRAPHY DUAL ENERGY CT WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1094">CT ABDOMEN DUAL ENERGY CT</Exam>  
 <Exam Code="RPID1101">CT CHEST ABDOMEN PELVIS ANGIOGRAPHY DUAL ENERGY CT WITHOUT THEN  
 WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1106">CT ABDOMEN PELVIS UROGRAPHY ANGIOGRAPHY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1171">CT CHEST ABDOMEN PELVIS UROGRAPHY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1181">CT CHEST ABDOMEN PELVIS MULTIPHASE WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1210">CT ABDOMEN MULTIPHASE SCREENING WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1215">CT CHEST ABDOMEN MULTIPHASE LIVER FOLLOW-UP PROCEDURE WITHOUT THEN  
 WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1231">CT CHEST ABDOMEN MULTIPHASE LIVER WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1232">CT ABDOMEN CERVICAL SPINE MULTIPHASE LIVER WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1233">CT NECK CHEST ABDOMEN PELVIS MULTIPHASE WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1258">CT NECK CHEST ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1264">CT CHEST ABDOMEN PELVIS MULTIPHASE LIVER WITHOUT THEN WITH IV  
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 <Exam Code="RPID1277">CT ABDOMEN LIMITED KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1283">CT ABDOMEN PELVIS CERVICAL SPINE UROGRAPHY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1303">CT CHEST ABDOMEN MULTIPHASE KIDNEY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1311">CT CHEST ABDOMEN MULTIPHASE PULMONARY ARTERIES EMBOLISM WITHOUT  
 THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1400">CT ABDOMEN PELVIS RECONSTRUCTION WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1403">CT ABDOMEN PELVIS ADRENAL WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1424">CT CHEST ABDOMEN PELVIS ANGIOGRAPHY KIDNEY DONOR WITHOUT THEN WITH  
 IV CONTRAST</Exam>  
 <Exam Code="RPID1451">CT ABDOMEN PELVIS COLONOGRAPHY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1459">CT ABDOMEN PELVIS ENTEROGRAPHY WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1494">CT ABDOMEN LIVER WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1503">CT NECK CHEST ABDOMEN WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1512">CT NECK ABDOMEN PELVIS WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1808">CT ABDOMEN UROGRAPHY KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1839">CT ABDOMEN PELVIS KIDNEY WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1857">CT ABDOMEN MULTIPHASE LIVER PANCREAS WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 <Exam Code="RPID1863">CT ABDOMEN CHEST LIVER WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1879">CT ABDOMEN PELVIS VASCULAR WITHOUT THEN WITH IV CONTRAST</Exam>  
 <Exam Code="RPID1882">CT ABDOMEN LIVER DUAL ENERGY CT WITHOUT THEN WITH IV  
 CONTRAST</Exam>  
 </AcceptableImagingExams>  
 <IndicationForFollowup Code="N28.89">Kidney mass</IndicationForFollowup>  
 <RecommendedTimeFrame Earliest="P165D" Latest="P210D"/>  
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