放射線治療分野のテストケース NTPL-Sについての説明

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テストシナリオの説明の前に

- テストで使用されるDICOMオブジェクト
  - CT
  - RT Structure Set
  - RT Plan(Geometric Plan)
  - RT Plan(Dosimetric Plan)
  - RT Dose
- 事前テストツール（RO専用）
- テストシナリオと基準

CT

- 一般的なCT
- 特にRO特有の規定はない
- テスト前にArchiveに登録されている状態
  - このとき、非圧縮で保存されていること

RT Structure Set

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	RT Series	C.8.8.1	M
	Clinical Trial Series	C.7.3.2	U
Equipment	General Equipment	C.7.5.1	M
Structure Set	Structure Set	C.8.8.5	M
	ROI Contour	C.8.8.6	M
	RT ROI Observations	C.8.8.8	M
	Approval	C.8.8.16	U
	SOP Common	C.12.1	M

Structure Set Module

Attribute	Tag	Type	Attribute Note
Structure Set Label	(3006,0002)	R+	
Structure Set Date	(3006,0008)	R+	
Structure Set Time	(3006,0009)	R+	
Referenced Frame of Reference Sequence	(3006,0010)	R+*	This element is required for all 3D RT Structure Sets which are image based. It is to contain a set of references to the entire set of images which comprise the volume from which the Structure Set was constructed, and which is to be used for planning. There should only be one item in this sequence, as a Structure is only based on a single set of images, which is all in the same frame of reference.
>Frame of Reference UID	(0020,0052)	R+*	This frame of reference UID shall be the same as the frame of reference of the CT series from which the RTSTRUCT was constructed. It will also be the same as the frame of reference of any related RTPLAN's or RTDOSE's.
>RT Referenced Study Sequence	(3006,0012)	R+*	Must be present, to contain series sequence. Only one item allowed in this sequence.
>>RT Referenced Series Sequence	(3006,0014)	R+*	Must be present, to contain Contour Image Sequence. Only one item allowed in this sequence.
>>>Series Instance UID	(0020,000E)	R+*	Must be present, and shall contain the series to which the set of CT images upon which the structure set is based belong.
>>>Contour Image Sequence	(3006,0016)	R+*	Must be present. Contains an item for each CT image in the volume upon which the Structure Set is based.
>>>>Referenced SOP Class UID	(0008,1155)	R+*	Must be present with a value of '1.2.840.10008.5.1.4.1.1.2' This profile is for volumes based on CT Images only
>>>>Referenced Frame Number	(0008,1160)	O+*	Shall not be present
Structure Set ROI Sequence	(3006,0020)	R+	This sequence must be present. It defines the ROI's in this RTSTRUCT

Attribute	Tag	Type	Attribute Note
>ROI Number	(3006,0022)	R*	This defines an index to be used for referencing a particular ROI item from other sequences. It is required to be unique within the scope of this message. No limitation on values other than uniqueness within sequence
>Referenced Frame of Reference UID	(3006,0024)	R*	This frame of reference UID shall be the same as the frame of reference of the CT series from which the RTSTRUCT was constructed. It will also be the same as the frame of reference of any related RTPLAN or RTDOSE instances.
>ROI Name	(3006,0026)	R+	This is the primary identifier for an ROI (from user perspective). Must be present and should match UI display. Must be unique within ROI sequence
>ROI Description	(3006,0028)	O+*	Not required - no compliant implementation shall rely on this element being present for proper operation.
>ROI Volume	(3006,002C)	O+*	Not required - no compliant implementation shall rely on this element being present for proper operation.
>ROI Generation Algorithm	(3006,0036)	R+	Must be present, with a value of AUTOMATIC, SEMIAUTOMATIC, or MANUAL. This information may be presented to a user, but no semantics for handling an RTSTRUCT is required for this profile. Implementations which create RTSTRUCT instances must provide an appropriate value.

ROI Contour Module

Attribute	Tag	Type	Attribute Note
ROI Contour Sequence	(3006,0039)	R	
>ROI Display Color	(3006,002A)	O+*	Not required - no compliant implementation shall rely on this element being present for proper operation. However applications are allowed to be aware of this element and use it to map display colors.
>Contour Sequence	(3006,0040)	R+*	Must be present. Must contain an item for each contour in the ROI. Compliant implementations must be able to handle as many as 100 contours on a single slice. That is, the number of contours in items in all Contour Sequences with the same z-coordinate (and referenced CT image) should be less than or equal to 100.
>>Contour Image Sequence	(3006,0016)	R+*	Must be present with a single item. This item is the image upon which this contour should be placed. If the contour type is CLOSED_PLANAR, then the z-coordinates of the contour must match the z-coordinate of Image Position Patient in the image.
>>>Referenced SOP Class UID	(0008,1150)	R+*	Must be present with a value of '1.2.840.10008.5.1.4.1.1.2'
>>>Referenced SOP Instance UID	(0008,1155)	R*	SOP Instance UID of the image being referenced.
>>>Referenced Frame Number	(0008,1160)	O+*	Shall not be present
>>Contour Geometric Type	(3006,0042)	R+*	Must be present, with a value of POINT or CLOSED_PLANAR. Conforming implementations must properly interpret this value.
>>Contour Slab Thickness	(3006,0044)	O+*	Not required - no compliant implementation shall rely on this element being present for proper operation.
>>Contour Offset Vector	(3006,0045)	O+*	The profile requires that this be zero if present.
>>Number of Contour Points	(3006,0046)	R+*	Required, and must match the actual number of points in Contour Data. Shall not exceed the number for which the Contour Data can not be encoded when using explicit transfer syntax.
>>Contour Data	(3006,0050)	R+*	Must be present. If contour type is CLOSED_PLANAR, then all points must have the same z-coordinate. This z-coordinate must match the z-coordinate in the related CT image within 0.01 mm (contained in the Contour Image sequence in the same item of the ROI Contour sequence as this data). An implication of this is that the CLOSED_PLANAR contours are axial.

ROI Observations Module

Attribute	Tag	Type	Attribute Note
RT ROI Observations Sequence	(3006,0080)	R+*	This sequence contains information about an ROI. It references the ROI in Referenced ROI Number which contains a number which must match one of the ROI numbers in one of the elements of the Structure Set ROI Sequence. In particular, an RTSTRUCT must contain an element in this sequence for ISOCENTER.
>Referenced ROI Number	(3006,0084)	R+*	Specifies the ROI to which this observation applies. For every item in Structure Set ROI sequence, at least one observation is required, with values in ROI Interpreted Type and ROI Interpreter.
>RT ROI Interpreted Type	(3006,00A4)	O+*	Required if there is not another item in the RT ROI observation sequence with the same Referenced ROI number which has this element populated or the ROI is only utilized to describe a physical property. If referenced ROI has associated contours of type CLOSED_PLANAR, must be one of: EXTERNAL PTV CTV GTV TREATED_VOLUME IRRAD_VOLUME BOLUS AVOIDANCE ORGAN MARKER CONTRAST_AGENT CAVITY If referenced ROI has associated contours of type POINT, must be one of: MARKER REGISTRATION ISOCENTER
>ROI Physical Properties Sequence	(3006,00B0)	O+*	Not required, but shall not be ignored if supplied.
>>ROI Physical Property	(3006,00B2)	R+*	Only relative electron density: REL_ELEC_DENSITY

RT Plan

IE	Module	Reference	Usage	IHE-RO Usage
Patient	Patient	C.7.1.1	M	M
	Clinical Trial Subject	C.7.1.3	U	U
Study	General Study	C.7.2.1	M	M
	Patient Study	C.7.2.2	U	U
	Clinical Trial Study	C.7.2.3	U	U
Series	RT Series	C.8.8.1	M	M
	Clinical Trial Series	C.7.3.2	U	U
Frame of Reference	Frame of Reference	C.7.4.1	U – See Note.	M
Equipment	General Equipment	C.7.5.1	M	M
Plan	RT General Plan	C.8.8.9	M	M
	RT Prescription	C.8.8.10	U	U(geometric), M(dosimetric)
	RT Tolerance Tables	C.8.8.11	U	U
	RT Patient Setup	C.8.8.12	U	U
	RT Fraction Scheme	C.8.8.13	U	U(geometric), M(dosimetric)
	RT Beams	C.8.8.14	C - Required if RT Fraction Scheme Module exists and Number of Beams (300A,0080) is greater than zero for one or more fraction groups	M (Can be excluded for zero beams with non-isocentricc model)
	RT Brachy Application Setups	C.8.8.15	C - Required if RT Fraction Scheme Module exists and Number of Brachy Application Setups (300A,00A0) is greater than zero for one or more fraction groups	N/A
	Approval	C.8.8.16	U	M
	Audio	C.10.3	U	U
	SOP Common	C.12.1	M	M

RT General Plan Module

Attribute	Tag	Type	Attribute Note
RT Plan Label	(300A,0002)	R+	The label which serves as the identification of the plan for the user.
RT Plan Date	(300A,0006)	R+	The date when the plan was last modified.
RT Plan Time	(300A,0007)	R+	The time when the plan was last modified.
RT Plan Geometry	(300A,000C)	R+*	Shall be PATIENT. This implies that the RT Structure Set exists and is referenced in the General Plan module.

RT Prescription Module

Attribute Name	Tag	Type	Attribute Description
Prescription Description	(300A,000E)	3	User-defined description of treatment prescription.
Dose Reference Sequence	(300A,0010)	3	Introduces sequence of Dose References. One or more items may be included in this sequence.
>Dose Reference Number	(300A,0012)	1C	Identification number of the Dose Reference. The value of Dose Reference Number (300A,0012) shall be unique within the RT Plan in which it is created. Required if Dose Reference Sequence (300A,0012) is sent.
>Dose Reference UID	(300A,0013)	3	A unique identifier for a Dose Reference that can be used to link the same entity across multiple RT Plan objects.
>Dose Reference Structure Type	(300A,0014)	1C	Structure type of Dose Reference. Required if Dose Reference Sequence (300A,0010) is sent. Defined Terms: POINT = dose reference point specified as ROI VOLUME = dose reference volume specified as ROI COORDINATES = point specified by Dose Reference Point Coordinates (300A,0018) SITE = dose reference clinical site
>Dose Reference Description	(300A,0016)	3	User-defined description of Dose Reference.
>Referenced ROI Number	(3006,0084)	1C	Uniquely identifies ROI representing the dose reference specified by ROI Number (3006,0022) in Structure Set ROI Sequence (3006,0020) in Structure Set Module within RT Structure Set in Referenced Structure Set Sequence (300C,0060) in RT General Plan Module. Required if Dose Reference Structure Type (300A,0014) is POINT or VOLUME and Dose Reference Sequence (300A,0010) is sent.
>Dose Reference Point Coordinates	(300A,0018)	1C	Coordinates (x,y,z) of Reference Point in the patient based coordinate system described in C.7.6.2.1.1 (mm). Required if Dose Reference Structure Type (300A,0014) is COORDINATES and Dose Reference Sequence (300A,0010) is sent.
>Nominal Prior Dose	(300A,001A)	3	Dose (in Gy) from prior treatment to this Dose Reference (e.g. from a previous course of treatment).
>Dose Reference Type	(300A,0020)	1C	Type of Dose Reference. Required if Dose Reference Sequence (300A,0010) is sent. Defined Terms: TARGET = treatment target (corresponding to GTV, PTV, or CTV in ICRU50) ORGAN_AT_RISK = Organ at Risk (as defined in ICRU50)
>Constraint Weight	(300A,0021)	3	Relative importance of satisfying constraint, where high values represent more important constraints.
>Delivery Warning Dose	(300A,0022)	3	The dose (in Gy) which when reached or exceeded should cause some action to be taken.
>Delivery Maximum Dose	(300A,0023)	3	The maximum dose (in Gy) which can be delivered to the dose reference.
>Target Minimum Dose	(300A,0025)	3	Minimum permitted dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) is TARGET.
>Target Prescription Dose	(300A,0026)	3	Prescribed dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) is TARGET.
>Target Maximum Dose	(300A,0027)	3	Maximum permitted dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) is TARGET.
>Target Underdose Volume Fraction	(300A,0028)	3	Maximum permitted fraction (in percent) of Target to receive less than the Target Prescription Dose if Dose Reference Type (300A,0020) is TARGET and Dose Reference Structure Type (300A,0014) is VOLUME. See C.8.8.10.1.
>Organ at Risk Full-volume Dose	(300A,002A)	3	Maximum dose (in Gy) to entire Dose Reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.
>Organ at Risk Limit Dose	(300A,002B)	3	Maximum permitted dose (in Gy) to any part of Dose Reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.
>Organ at Risk Maximum Dose	(300A,002C)	3	Maximum dose (in Gy) to non-overdosed part of Dose Reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.
>Organ at Risk Overdose Volume Fraction	(300A,002D)	3	Maximum permitted fraction (in percent) of the Organ at Risk to receive more than the Organ at Risk Maximum Dose if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.

RT Fraction Scheme Module

Attribute Name	Tag	Type	Attribute Description
Fraction Group Sequence	(300A,0070)	1	Introduces sequence of Fraction Groups in current Fraction Scheme. One or more items may be included in this sequence.
>Fraction Group Number	(300A,0071)	1	Identification number of the Fraction Group. The value of Fraction Group Number (300A,0071) shall be unique within the RT Plan in which it is created.
>Fraction Group Description	(300A,0072)	3	The user defined description for the fraction group.
>Referenced Dose Sequence	(300C,0080)	3	Introduces sequence of related SOP Class/Instance pairs describing related instances of RT Dose (for grids, isodose curves and named/unnamed point doses). One or more items may be included in this sequence. See Note 1.
>>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class. Required if Referenced Dose Sequence (300C,0080) is sent.
>>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance. Required if Referenced Dose Sequence (300C,0080) is sent.
>Referenced Dose Reference Sequence	(300C,0050)	3	Introduces sequence of Dose References for the current Fraction Group. One or more items may be included in this sequence.
>>Referenced Dose Reference Number	(300C,0051)	1C	Uniquely identifies Dose Reference specified by Dose Reference Number (300A,0012) within Dose Reference Sequence (300A,0010) in RT Prescription Module. Required if Referenced Dose Reference Sequence (300C,0050) is sent.
>>Constraint Weight	(300A,0021)	3	Relative importance of satisfying constraint, where high values represent more important constraints.
>>Delivery Warning Dose	(300A,0022)	3	The dose (in Gy) which when reached or exceeded should cause some action to be taken.
>>Delivery Maximum Dose	(300A,0023)	3	The maximum dose (in Gy) which can be delivered to the dose reference.
>>Target Minimum Dose	(300A,0025)	3	Minimum permitted dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET.
>>Target Prescription Dose	(300A,0026)	3	Prescribed dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET.
>>Target Maximum Dose	(300A,0027)	3	Maximum permitted dose (in Gy) to Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET.
>>Target Underdose Volume Fraction	(300A,0028)	3	Maximum permitted fraction (in percent) of Target to receive less than the Target Prescription Dose (300A,0027) if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.
>>Organ at Risk Full-volume Dose	(300A,002A)	3	Maximum dose (in Gy) to entire Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.
>>Organ at Risk Limit Dose	(300A,002B)	3	Maximum permitted dose (in Gy) to any part of Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.
>>Organ at Risk Maximum Dose	(300A,002C)	3	Maximum dose (in Gy) to non-overdosed part of Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.
>>Organ at Risk Overdose Volume Fraction	(300A,002D)	3	Maximum permitted fraction (in percent) of Organ at Risk to receive more than the Organ at Risk Maximum Dose if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.
>Number of Fractions Planned	(300A,0078)	2	Total number of treatments (Fractions) prescribed for current Fraction Group.
>Number of Fraction Pattern Digits Per Day	(300A,0079)	3	Number of digits in Fraction Pattern (300A,007B) used to represent one day. See Note 2.
>Repeat Fraction Cycle Length	(300A,007A)	3	Number of weeks needed to describe treatment pattern. See Note 2.
>Fraction Pattern	(300A,007B)	3	String of 0's (no treatment) and 1's (treatment) describing treatment pattern. Length of string is 7 x Number of Fraction Pattern Digits Per Day x Repeat Fraction Cycle Length. Pattern shall start on a Monday. See Note 2.
>Number of Beams	(300A,0080)	1	Number of Beams in current Fraction Group. If Number of Beams is greater then zero, Number of Brachy Application Setups (300A,00A0) shall equal zero.
>Referenced Beam Sequence	(300C,0004)	1C	Introduces sequence of treatment beams in current Fraction Group. Required if Number of Beams (300A,0080) is greater than zero. One or more items may be included in this sequence.
>>Referenced Beam Number	(300C,0006)	1C	Uniquely identifies Beam specified by Beam Number (300A,00C0) within Beam Sequence (300A,00B0) in RT Beams Module. Required if Referenced Beam Sequence (300C,0004) is sent.
>>Beam Dose Specification Point	(300A,0082)	3	Coordinates (x,y,z) of point at which Beam Dose is specified in the patient based coordinate system described in C.7.6.2.1.1 (mm). See Note 3.
>>Beam Dose	(300A,0084)	3	Dose (in Gy) at Beam Dose Specification Point (300A,0082) due to current Beam.
>>Beam Dose Point Depth	(300A,0088)	3	The depth (in mm) in the patient along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082).
>>Beam Dose Point Equivalent Depth	(300A,0089)	3	The radiological depth in mm (water-equivalent depth, taking tissue heterogeneity into account) in the patient along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082).
>>Beam Dose Point SSD	(300A,008A)	3	Source to patient surface distance along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082).
>>Beam Meterset	(300A,0086)	3	Machine setting to be delivered for current Beam, specified in Monitor Units (MU) or minutes as defined by Primary Dosimeter Unit (300A,00B3) (in RT Beams Module) for referenced Beam. See Note 4.
>Number of Brachy Application Setups	(300A,00A0)	1	Number of Brachy Application Setups in current Fraction Group. If Number of Brachy Application Setups is greater then zero, Number of Beams (300A,0080) shall equal zero.
>Referenced Brachy Application Setup Sequence	(300C,000A)	1C	Introduces sequence of treatment Brachy Application Setups in current Fraction Group. Required if Number of Brachy Application Setups (300A,00A0) is greater than zero. One or more items may be included in this sequence.
>>Referenced Brachy Application Setup Number	(300C,000C)	1C	Uniquely identifies Brachy Application Setup specified by Brachy Application Setup Number (300A,0234) within Brachy Application Setup Sequence (300A,0230) in RT Brachy Application Setups Module. Required if Referenced Brachy Application Setup Sequence (300C,000A) is sent.
>>Brachy Application Setup Dose Specification Point	(300A,00A2)	3	Coordinates (x,y,z) of point in the patient based coordinate system described in C.7.6.2.1.1 at which Brachy Application Setup Dose (300A,00A4) is specified (mm).
>>Brachy Application Setup Dose	(300A,00A4)	3	Dose (in Gy) at Brachy Application Setup

RT Beams Module

Attribute	Tag	Type	Attribute Note
Beam Sequence	(300A,00B0)	R+*	An actor must be able to safely handle up to 100 Beam Sequence Items (beams)
>Beam Name	(300A,00C2)	R+	Equipment which creates new series based on other series (i.e. resampled series, new structure sets, plans, etc) must preserve the value of this element to adhere to this profile. The Beam Name must be unique within the sequence
>Beam Type	(300A,00C4)	R+*	For Geometric Plans the value is constrained to: STATIC Only static beams shall be specified in Geometric Plans. This will allow non-arc-based IMRT (such as Step-and-Shoot or Sliding Window techniques, but not techniques such as fixed aperture arc beams, conformal arc beams, or intensity modulated arc beams. As a result, all beams in Geometric Plans shall consist of exactly two control points.
>Radiation Type	(300A,00C6)	R+*	Any value other than PHOTON is outside the scope of the profile
>High-Dose Technique Type	(300A,00C7)	O+*	Geometric Plans shall not specify this attribute.
>Treatment Machine Name	(300A,00B2)	O+*	An Actor must not rely on the presence of this attribute.
>Source-Axis Distance	(300A,00B4)	R+*	This attribute is critical for providing information regarding beam divergence.
>Beam Limiting Device Sequence	(300A,00B6)		For IHE-RO, shall report at least one set of MLC descriptions or the descriptions of two sets of jaws.
>Referenced Patient Setup Number	(300C,006A)	R+*	
>Number of Wedges	(300A,00D0)	R+*	Geometric Plans are constrained to a value of 0 (i.e. a Geometric Plan must not include a Wedge).
>Number of Compensators	(300A,00E0)	R+*	Geometric Plans are constrained to a value of 0 (i.e. a Geometric Plan must not include a Compensator).
>Number of Boli	(300A,00ED)	R+*	Geometric Plans are constrained to a value of 0 (i.e. a Geometric Plan must not include any Boli).
>Number of Blocks	(300A,00F0)	R+*	All actors shall be able to handle 8 block items, of which no more than one may be an aperture
>Block Sequence	(300A,00F4)		
>>Block Divergence	(300A,00FA)	R+*	Must be present and non-null if Block Sequence is present (i.e. when Number of Blocks is 1 or more), with a value of PRESENT
>>Block Number of Points	(300A,0104)	R+*	The value is constrained to be 3 or more.
>>Block Data	(300A,0106)	R+*	Shall be present and non-null. Limitations on the total number of points are limited only by DICOM limitations on representation with 'explicit VR' in total byte lengths. Systems that limit support of legal sequences shall safely handle receipt of such sequences that exceed their limitations, and document this behavior in their IHE-RO Profile adherence statement.
>Applicator Sequence	(300A,0107)		Not expected in Geometric Plans. However, if present, shall be handled in a safe manner by the receiving system (and document this behavior in their IHE-RO Profile adherence statement). Applications exporting this value are outside the scope of the 2006 Profile.
>Final Cumulative Meterset Weight	(300A,010E)	O+*	Shall not be present in a Geometric Plan.
>Number of Control Points	(300A,0110)	R+*	Shall have a value of 2 for Geometric Plans.
>Control Point Sequence	(300A,0111)	R+*	For Geometric Plans the second control point (sequence item) shall contain only: • Control Point Index (300A,0112) with a value of 1 • Cumulative Meterset Weight (300A,0134) set NULL.
>>Cumulative Meterset Weight	(300A,0134)	O+*	Shall be NULL for Geometric Plans (in both the first and second control point).
>>Referenced Dose Reference Sequence	(300C,0050)	O+*	Shall not be present for Geometric Plans. Must not be relied upon by actors operating on the object as a Geometric Plan.
>>Nominal Beam Energy	(300A,0114)	O+*	Actors must not rely on the presence of this attribute to operate correctly. However, if this attribute is present, actors may not ignore the value.
>>Dose Rate Set	(300A,0115)	O+*	Actors must not rely on the presence of this attribute to operate correctly. However, if this attribute is present, actors may not ignore the value.
>>Wedge Position Sequence	(300A,0116)	O+*	Must not be present in a Geometric Plan
>>Beam Limiting Device Position Sequence	(300A,011A)	R+*	Must be present and correspond to those devices defined in the Beam Limiting Device Sequence. It shall be present for a Geometric Plan for Control Point Index 0 only.
>>Gantry Rotation Direction	(300A,011F)	R+*	For a Geometric Plan for Control Point Index 0 only, must have a value of NONE.

RT Dose

IE	Module	Reference	Usage	IHE-RO Usage
Patient	Patient	C.7.1.1	M	
	Clinical Trial Subject	C.7.1.3	U	
Study	General Study	C.7.2.1	M	
	Patient Study	C.7.2.2	U	
	Clinical Trial Study	C.7.2.3	U	
Series	RT Series	C.8.8.1	M	
	Clinical Trial Series	C.7.3.2	U	
Frame of Reference	Frame of Reference	C.7.4.1	M	
Equipment	General Equipment	C.7.5.1	M	
Dose	General Image	C.7.6.1	C - Required if dose data contains grid-based doses.	Shall be present **M**
	Image Plane	C.7.6.2	C - Required if dose data contains grid-based doses.	Shall be present **M**
	Image Pixel	C.7.6.3	C - Required if dose data contains grid-based doses.	Shall be present **M**
	Multi-Frame	C.7.6.6	C - Required if dose data contains grid-based doses and pixel data is multi-frame data.	Shall be present **M**
	Overlay Plane	C.9.2	U	
	Multi-Frame Overlay	C.9.3	U	
	Modality LUT	C.11.1	U	
	RT Dose	C.8.8.3	M	
	RT DVH	C.8.8.4	U	This module is outside the scope of this profile.
	Structure Set	C.8.8.5	C - Required if dose data contains dose points or isodose curves	This module is outside the scope of this profile.
	ROI Contour	C.8.8.6	C - Required if dose data contains dose points or isodose curves	This module is outside the scope of this profile.
	RT Dose ROI	C.8.8.7	C - Required if dose data contains dose points or isodose curves	This module is outside the scope of this profile.
	Audio	C.10.3	U	This module is outside the scope of this profile.
	SOP Common	C.12.1	M	

RT Dose Module

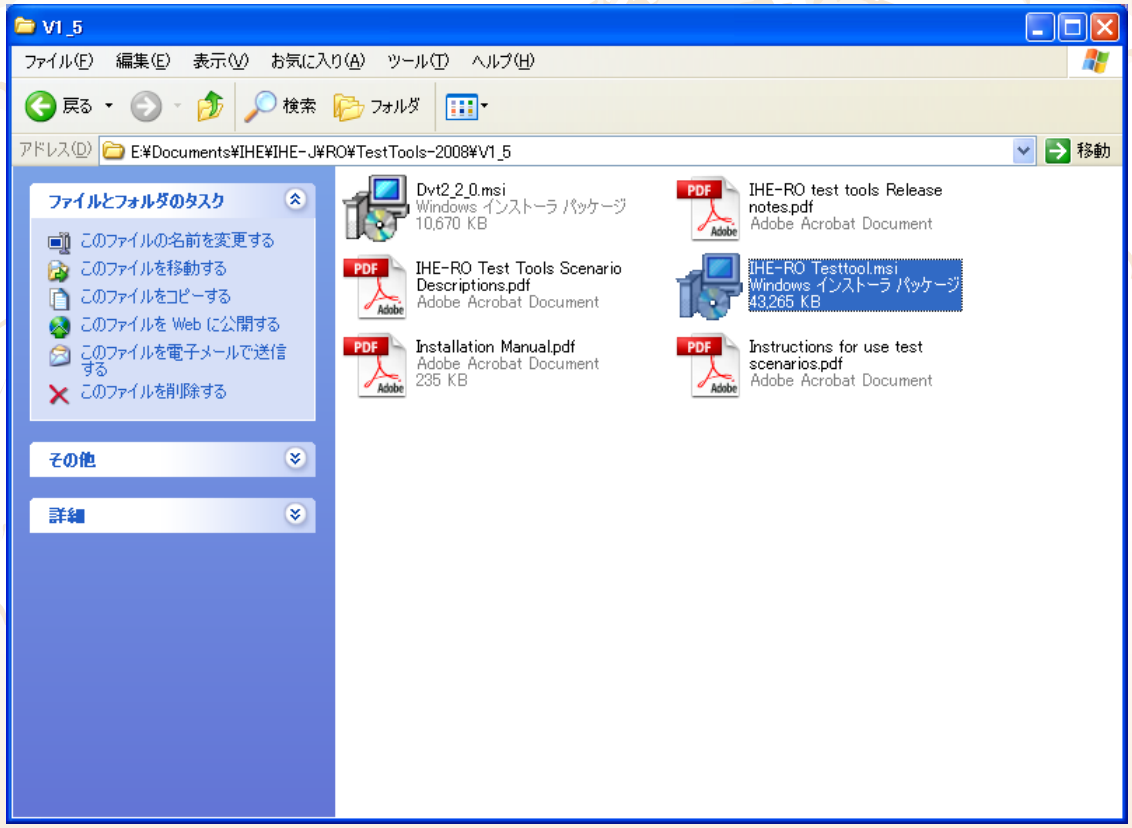
Attribute	Tag	Type	Attribute Note
Samples per Pixel	(0028,0002)	R+*	Shall be present and equal to 1
Photometric Interpretation	(0028,0004)	R+*	Shall be present and equal to **MONOCHROME2**
Bits Allocated	(0028,0100)	R+*	Shall be present and equal to 16 or 32
Bits Stored	(0028,0101)	R+*	Shall be equal to Bits Allocated
High Bit	(0028,0102)	R+*	Shall be one less than Bits Stored

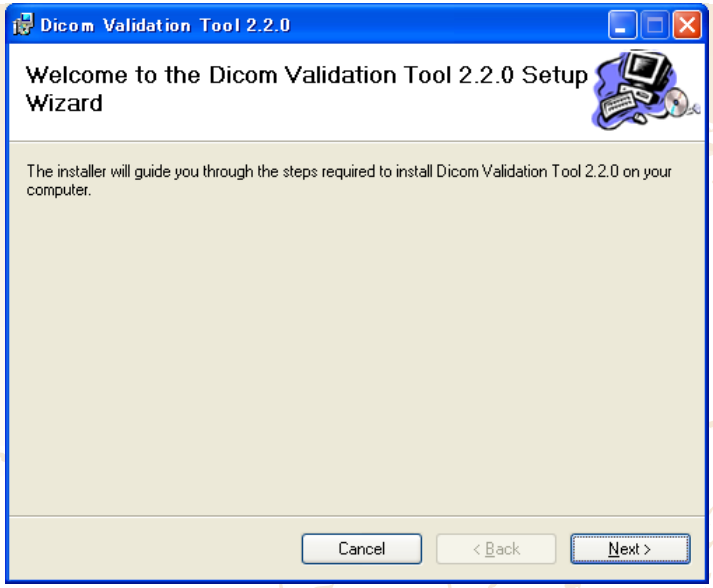
Attribute	Tag	Type	Attribute Note
Pixel Representation	(0028,0103)	R+*	Shall have the value 0 = unsigned integer. Negative dose values shall not be present.
Dose Units	(3004,0002)	R+*	Shall be equal to the enumerated value **GY**
Dose Type	(3004,0004)	R+*	Shall be equal to the defined term **PHYSICAL**
Dose Comment	(3004,0006)	R+	Shall be present and not empty if Referenced RT Plan Sequence (300C,0002) is missing, in which case it should have the same value as RT Plan Description.
Normalization Point	(3004,0008)	O+*	Shall not be relied on.
Dose Summation Type	(3004,000A)	R+*	Shall have the value **PLAN**.
Referenced RT Plan Sequence	(300C,0002)	R	Shall be present if Dose Summation Type (3004,000A) has the value **PLAN**.
>Referenced Fraction Group Sequence	(300C,0020)	R+*	Shall be present if the parent sequence is present, and shall reference a single fraction group within the referenced RT Plan.
Grid Frame Offset Vector	(3004,000C)	R+*	First z coordinate shall be equal to zero. The remaining z coordinates shall be relative to the starting z position in Image Position (Patient) (0020,0032).
Tissue Heterogeneity Correction	(3004,0014)	O+	Shall be present but may be null. The value shall be given if known.

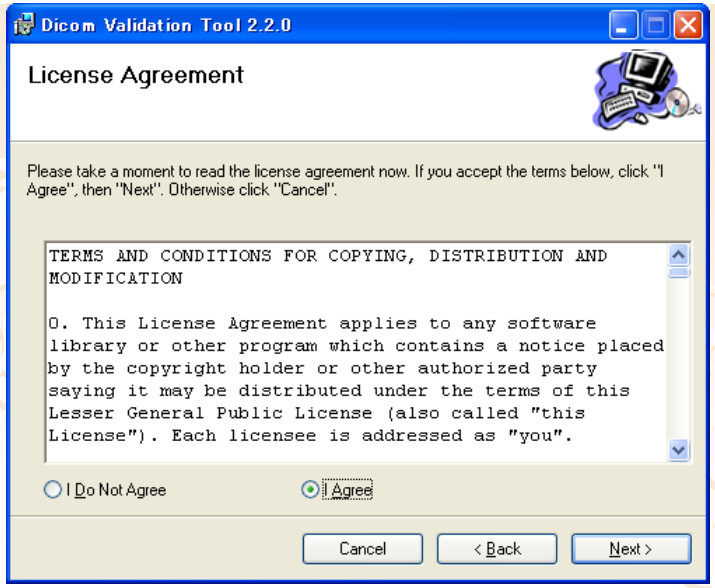
事前テストツール（RO専用）

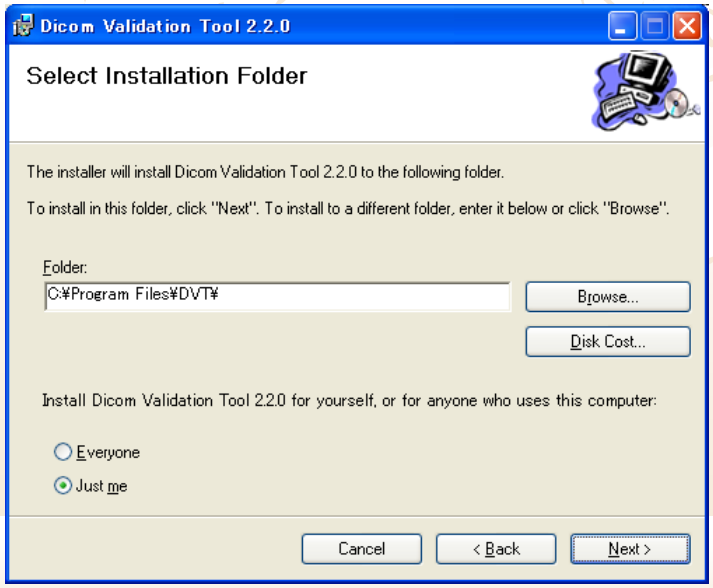
- 放射線治療用のツールを使用
- 後日、メールにて配布
  - インストール方法について
  - 使用方法について

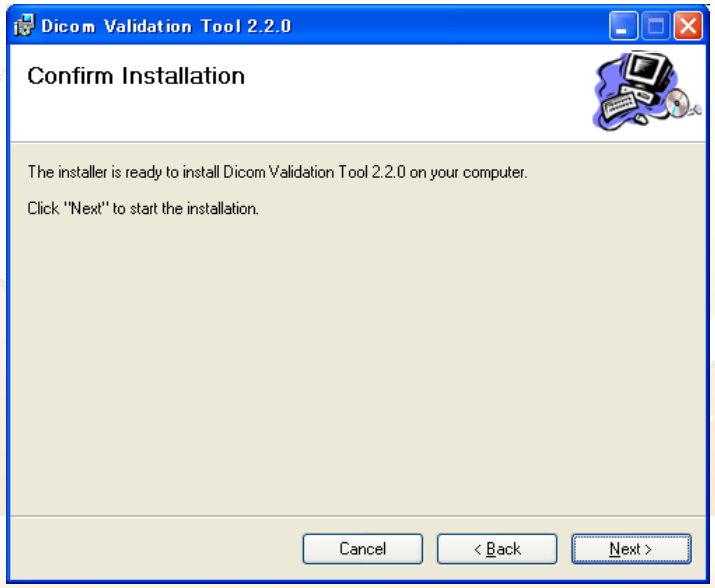
事前テストツールのインストール

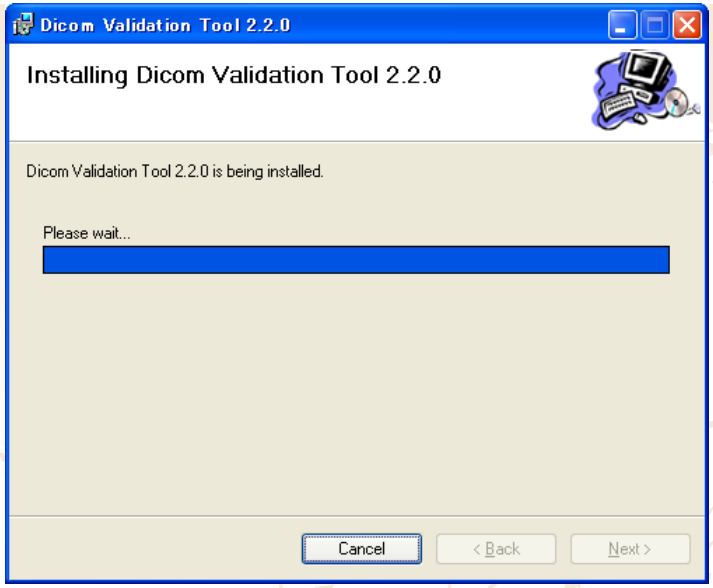


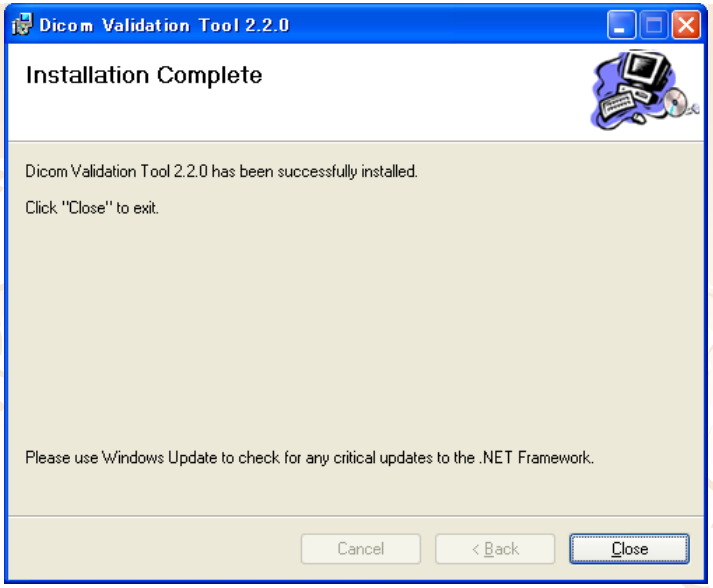

Dicom Validation Tool 2.2.0
Welcome to the Dicom Validation Tool 2.2.0 Setup Wizard
The installer will guide you through the steps required to install Dicom Validation Tool 2.2.0 on your computer.
Cancel
< Back
Next >

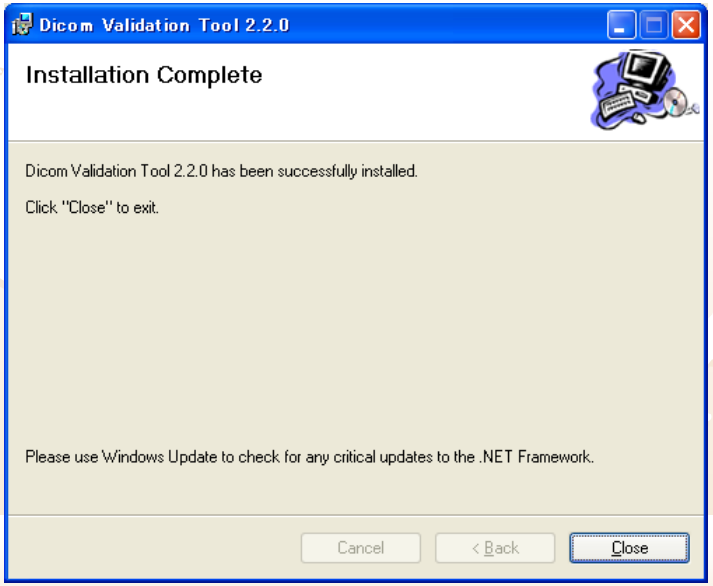

Dicom Validation Tool 2.2.0
License Agreement
Please take a moment to read the license agreement now. If you accept the terms below, click "I Agree", then "Next". Otherwise click "Cancel".
TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION
0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".
I Do Not Agree
I Agree
Cancel
< Back
Next >

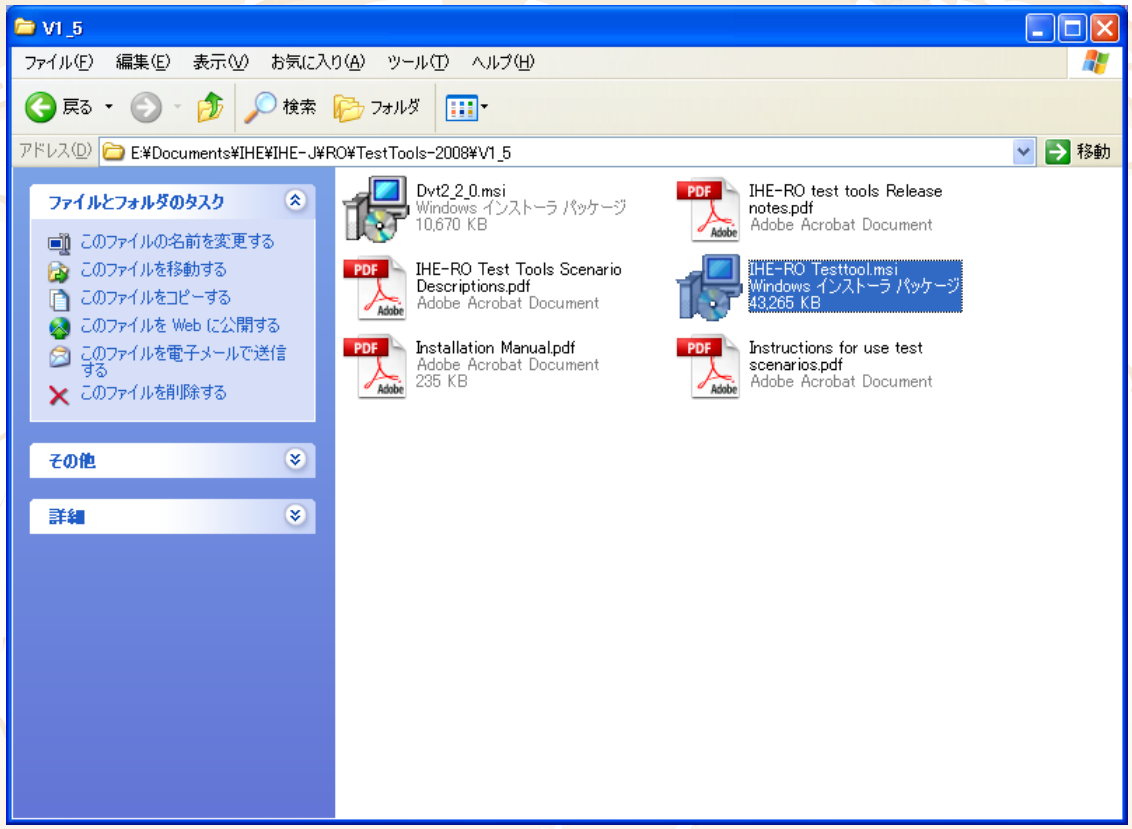

Dicom Validation Tool 2.2.0
Select Installation Folder
The installer will install Dicom Validation Tool 2.2.0 to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:¥Program Files¥DVT¥
Browse...
Disk Cost...
Install Dicom Validation Tool 2.2.0 for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

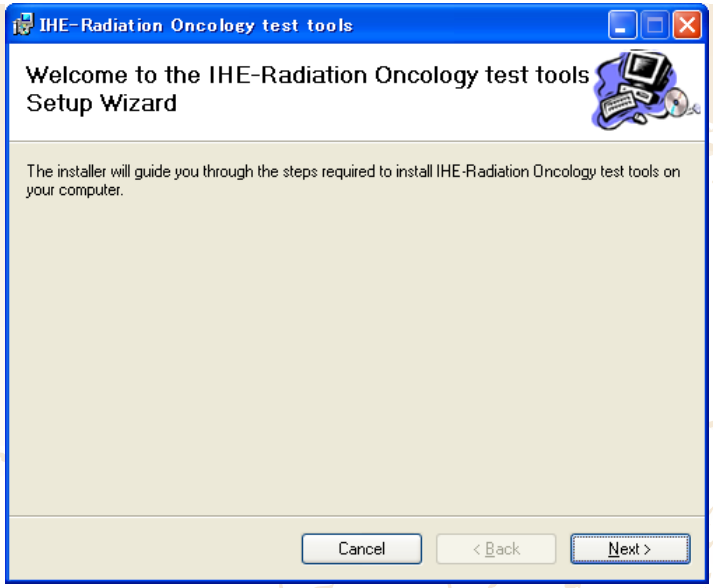

Dicom Validation Tool 2.2.0
Confirm Installation
The installer is ready to install Dicom Validation Tool 2.2.0 on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

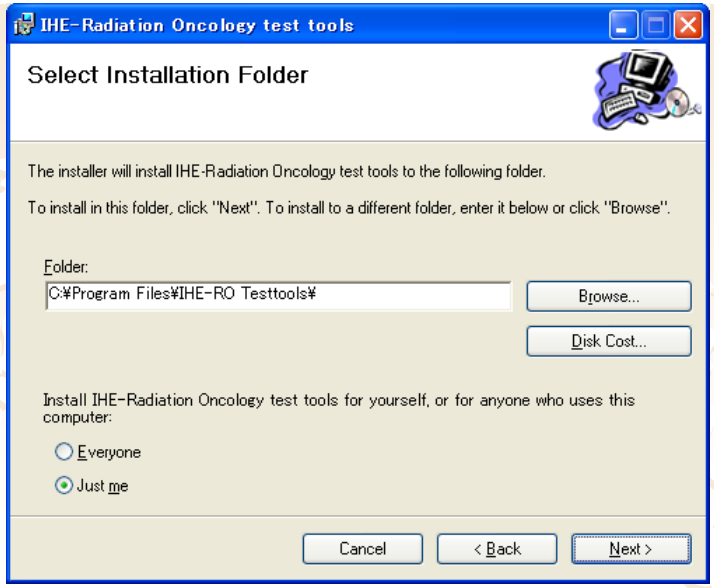

Dicom Validation Tool 2.2.0
Installing Dicom Validation Tool 2.2.0
Dicom Validation Tool 2.2.0 is being installed.
Please wait...
Cancel
< Back
Next >

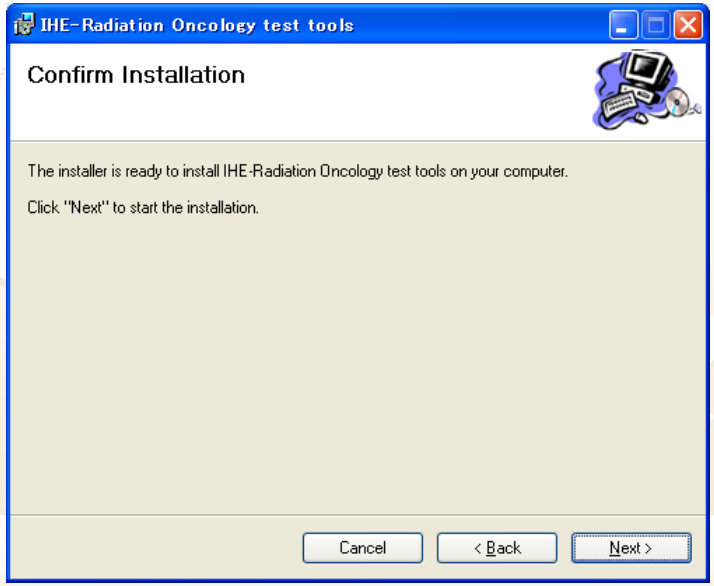

Dicom Validation Tool 2.2.0
Installation Complete
Dicom Validation Tool 2.2.0 has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

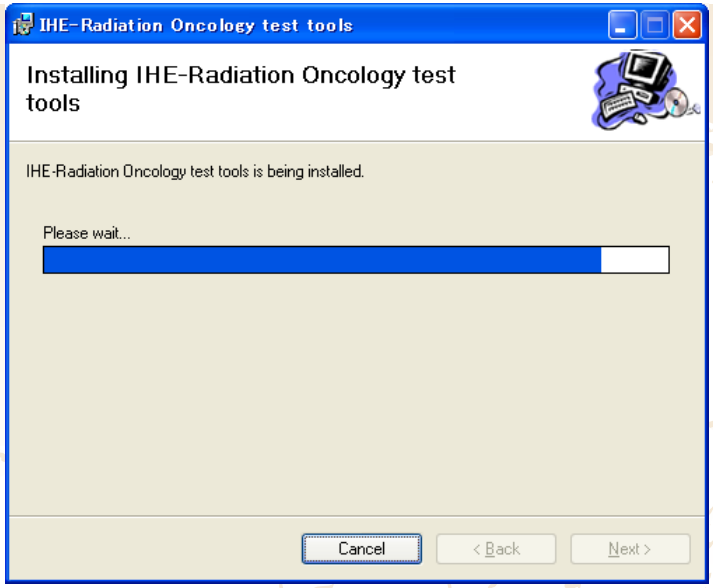

Dicom Validation Tool 2.2.0
Installation Complete
Dicom Validation Tool 2.2.0 has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

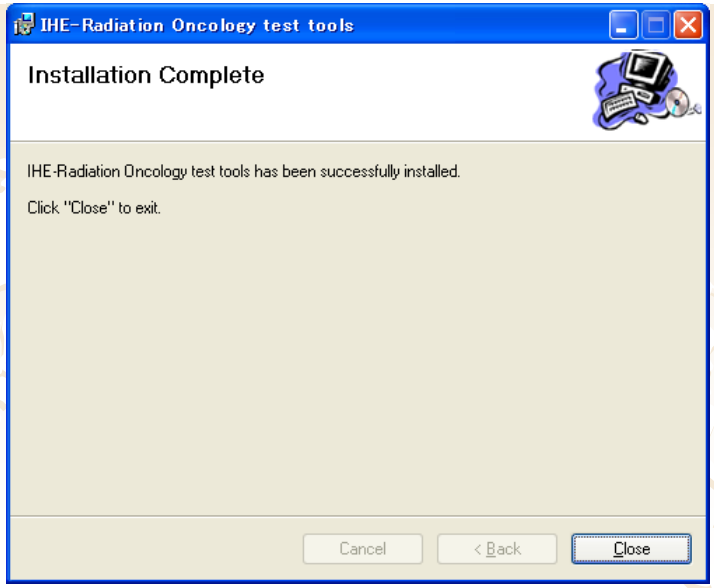

V1_5
ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)
戻る
検索
フォルダ
アドレス(D) E:¥Documents¥IHE¥IHE-J¥RO¥TestTools-2008¥V1_5
移動
ファイルとフォルダのタスク
このファイルの名前を変更する
このファイルを移動する
このファイルをコピーする
このファイルを Web に公開する
このファイルを電子メールで送信する
このファイルを削除する
その他
詳細
Dvt2_2_0.msi
Windows インストーラ パッケージ
10,670 KB
IHE-RO test tools Release notes.pdf
Adobe Acrobat Document
IHE-RO Test Tools Scenario Descriptions.pdf
Adobe Acrobat Document
IHE-RO Testtool.msi
Windows インストーラ パッケージ
43,265 KB
Installation Manual.pdf
Adobe Acrobat Document
235 KB
Instructions for use test scenarios.pdf
Adobe Acrobat Document

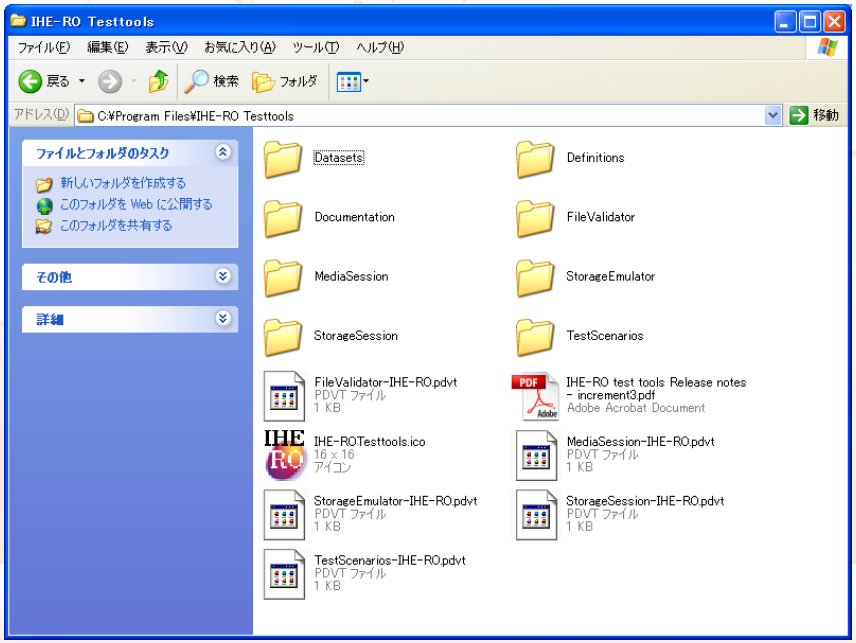

IHE-Radiation Oncology test tools
Welcome to the IHE-Radiation Oncology test tools Setup Wizard
The installer will guide you through the steps required to install IHE-Radiation Oncology test tools on your computer.
Cancel
< Back
Next >


IHE-Radiation Oncology test tools
Select Installation Folder
The installer will install IHE-Radiation Oncology test tools to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:¥Program Files¥IHE-RO Testtools¥
Browse...
Disk Cost...
Install IHE-Radiation Oncology test tools for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >


IHE-Radiation Oncology test tools
Confirm Installation
The installer is ready to install IHE-Radiation Oncology test tools on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

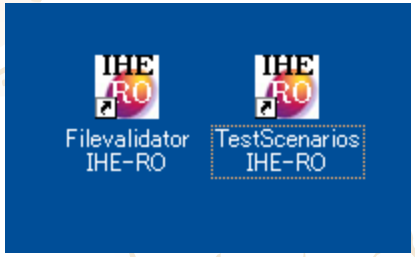




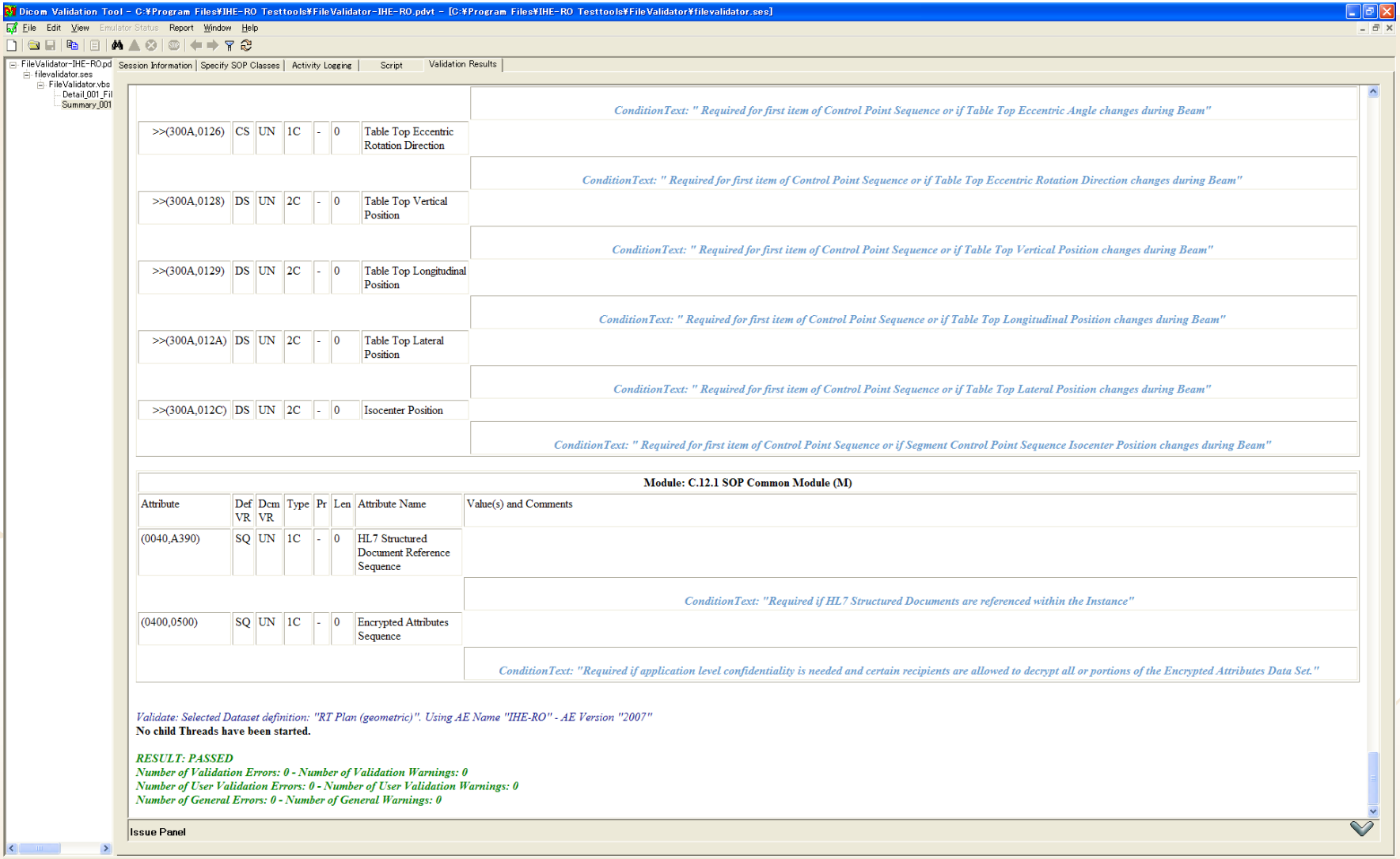


使用方法の詳細は、インストールフォルダ内の**Documentation**を参照してください。

事前テストツールの使用方法



- Filevalidator
  - 作成したDICOMデータの検証に使用する。
- TestSenarios
  - DICOM通信テストに使用する。


Dicom Validation Tool - C:¥Program Files¥IHE-RO Testtools¥FileValidator-IHE-RO.pdvt - [C:¥Program Files¥IHE-RO Testtools¥FileValidator¥filevalidator.ses]
File Edit View Emulator Status Report Window Help
FileValidator-IHE-RO.pd
filevalidator.ses
FileValidator.vbs
Detail_001_Fil
Summary_001
Session Information
Specify SOP Classes
Activity Logging
Script
Validation Results
ConditionText: " Required for first item of Control Point Sequence or if Table Top Eccentric Angle changes during Beam"
>>(300A,0126) CS UN 1C - 0 Table Top Eccentric Rotation Direction
ConditionText: " Required for first item of Control Point Sequence or if Table Top Eccentric Rotation Direction changes during Beam"
>>(300A,0128) DS UN 2C - 0 Table Top Vertical Position
ConditionText: " Required for first item of Control Point Sequence or if Table Top Vertical Position changes during Beam"
>>(300A,0129) DS UN 2C - 0 Table Top Longitudinal Position
ConditionText: " Required for first item of Control Point Sequence or if Table Top Longitudinal Position changes during Beam"
>>(300A,012A) DS UN 2C - 0 Table Top Lateral Position
ConditionText: " Required for first item of Control Point Sequence or if Table Top Lateral Position changes during Beam"
>>(300A,012C) DS UN 2C - 0 Isocenter Position
ConditionText: " Required for first item of Control Point Sequence or if Segment Control Point Sequence Isocenter Position changes during Beam"
Module: C.12.1 SOP Common Module (M)
Attribute Def VR Dcm VR Type Pr Len Attribute Name Value(s) and Comments
(0040,A390) SQ UN 1C - 0 HL7 Structured Document Reference Sequence
ConditionText: "Required if HL7 Structured Documents are referenced within the Instance"
(0400,0500) SQ UN 1C - 0 Encrypted Attributes Sequence
ConditionText: "Required if application level confidentiality is needed and certain recipients are allowed to decrypt all or portions of the Encrypted Attributes Data Set."
Validate: Selected Dataset definition: "RT Plan (geometric)". Using AE Name "IHE-RO" - AE Version "2007"
No child Threads have been started.
RESULT: PASSED
Number of Validation Errors: 0 - Number of Validation Warnings: 0
Number of User Validation Errors: 0 - Number of User Validation Warnings: 0
Number of General Errors: 0 - Number of General Warnings: 0
Issue Panel

Dicom Validation Tool - C:¥Program Files¥IHE-RO Testtools¥TestScenarios-IHE-RO.pdvt - [C:¥Program Files¥IHE-RO Testtools¥TestScenarios¥TestScenarios.ses]

File Edit View Emulator Status Report Window Help

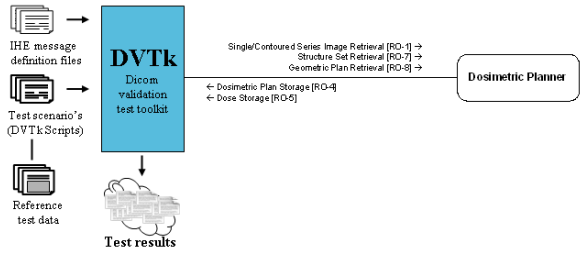
TestScenarios-IHE-RO.p
TestScenarios.ses
ArchiveScenario1
ContourerEquidis
ContourerScenari
ContourerScenari
ContourerScenari
DoseDisplayerEq
DoseDisplayerSc
DoseDisplayerSc
DosimetricPlanne
DosimetricPlanne
DosimetricPlanne
GeometricPlanner
GeometricPlanner
GeometricPlanner

Session Information | Specify SOP Classes | Activity Logging | Script

Test Scenario 1 Dosimetric Planner equidistant

Instructions for use test scenarios
Rule overview dosimetric planner equidistant scenario 1

Description:
This test scenario provides the dosimetric planner with RO-1, RO-7 and RO-8 and receives RO-4 and RO-5
- Checks the correct storage of Single/contoured CT series dataset (DICOM assoc. & interaction level)
- Checks the correct storage of the Structure set (DICOM association & interaction level)
- Checks the correct storage of the (Geometric) Plan (DICOM association & interaction level)
- Validation of the created Dosimetric Plan (RO-4) (including RO critical modules)
- Verifies the critical attribute mapping requirements

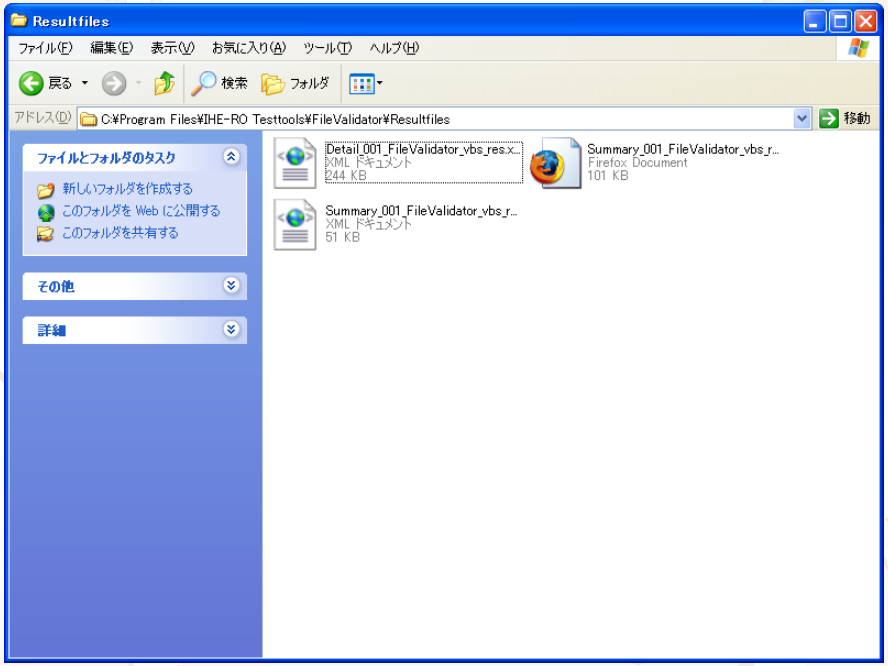


Transactions sent to actor:
RO-1 (Single/Contoured Series Image Retrieval)
RO-7 (Structure Set Retrieval)
RO-8 (Geometric Plan Retrieval)

Expected transactions from actor:
RO-4 (Dosimetric Plan Storage)
RO-5 (Dose Storage)

Used scenario dataset:
This scenario uses the equidistant reference test dataset.

事前テスト結果の提出

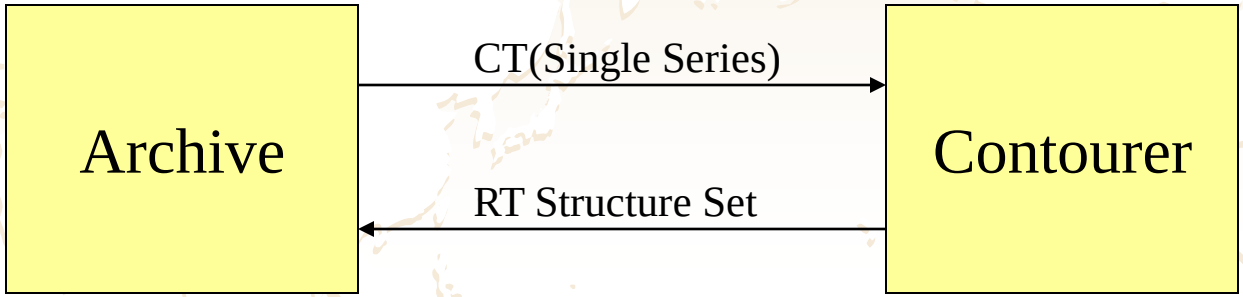


Resultfilesフォルダ内のファイルを提出してください。

テストシナリオについて

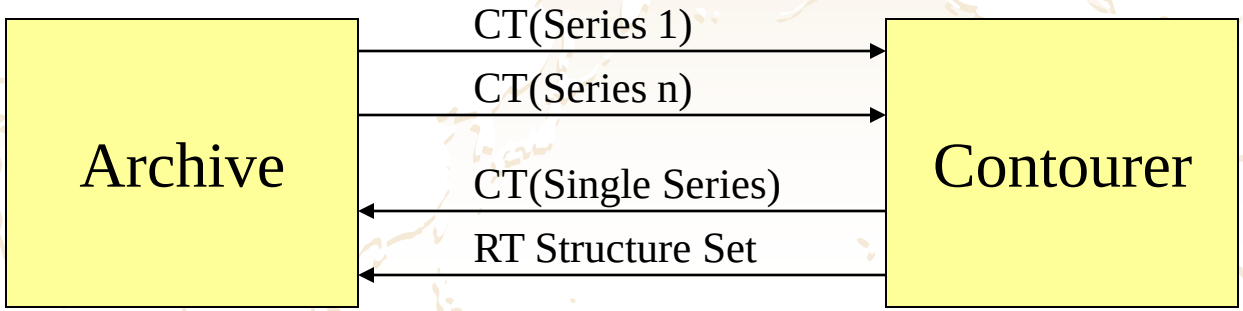
- Create Contour(Single Series CT)
- Create Contour(Multi Series CT)
- Create Geometric Plan
- Create Dosimetric Plan
- Dose Display

Create Contour(Single Series CT)



- ArchiveがCT(Single Series)をC-StoreでContourerに送信。
- ContourerがRT Structure SetをC-StoreでArchiveに送信。

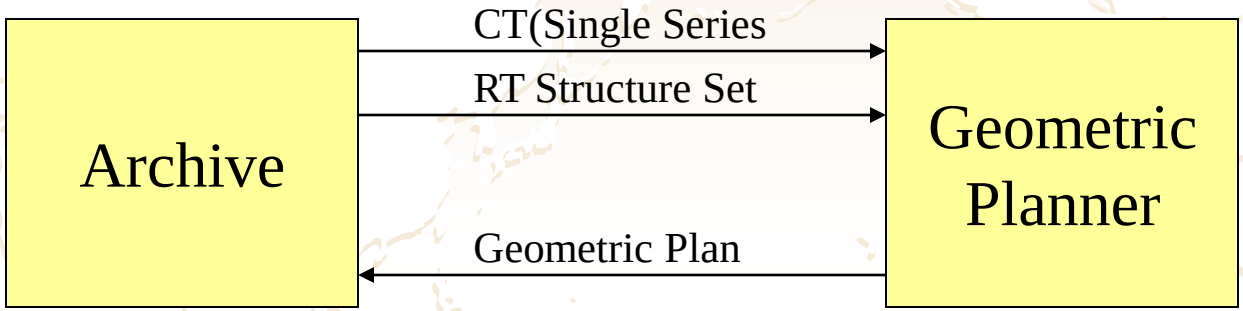
Create Contour(Multi Series CT)



- ArchiveがCT(Series 1)をC-StoreでContourerに送信。
- ArchiveがCT(Series n)をC-StoreでContourerに送信。
- ContourerがCT(Single Series)をC-StoreでArchiveに送信。
- ContourerがRT Structure SetをC-StoreでArchiveに送信。

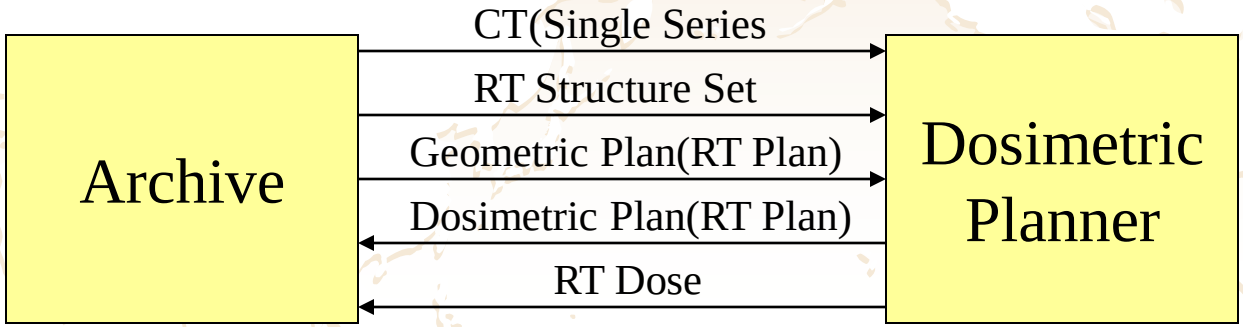
- オプションなので、テストを行わなくとも良い。

Create Geometric Plan



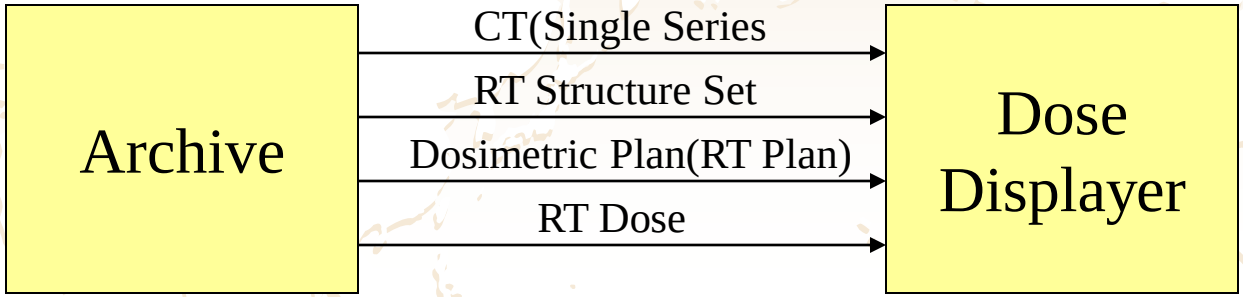
- ArchiveがCT(Single Series)をC-StoreでGeometric Plannerに送信。
- ArchiveがRT Structure SetをC-StoreでGeometric Plannerに送信。
- Geometric PlannerがGeometric Plan(RT Plan)をC-StoreでArchiveに送信。

Create Dosimetric Plan



- ArchiveがCT(Single Series)をC-StoreでDosimetric Plannerに送信。
- ArchiveがRT Structure SetをC-StoreでDosimetric Plannerに送信。
- ArchiveがGeometric Plan(RT Plan)をC-StoreでDosimetric Plannerに送信。
- Dosimetric PlannerがDosimetric Plan(RT Plan)をC-StoreでArchiveに送信。
- Dosimetric PlannerがRT DoseをC-StoreでArchiveに送信。

Dose Display



- ArchiveがCT(Single Series)をC-StoreでDose Displayerに送信。
- ArchiveがRT Structure SetをC-StoreでDose Displayerに送信。
- ArchiveがDosimetric Plan(RT Plan)をC-StoreでDose Displayerに送信。
- ArchiveがRT DoseをC-StoreでDose Displayerに送信。
- Dose Displayerが線量分布を表示。

アクタの判定基準

- 作成された各DICOM-RTオブジェクトに違反がないこと。（IHE-Radiation Oncology TF v1.6）
- 各DICOM-RTオブジェクトの情報が問題なく再現できること。（ IHE-Radiation Oncology TF v1.6 ）

- 保存されたデータが送信データと同等であること。（Archive）
- 保存されたデータの閲覧（検索）が容易にできること。（Archive）
  - DICOM-RTの識別が可能なこと

Contourer

- CTをArchiveから受信できること。
- 輪郭情報をStructure SetとしてArchiveへ送信が出来ること。
- Structure Setの内容が規定に違反していないこと。
  - 輪郭情報が複数セットされていること。
  - 輪郭の種類は Point もしくは、Closed Planarであること。
  - ROIの種類が規定のものであること。
  - Referenced SOP Instance UID(使用するCTのもの)に正しいUIDがセットされていること。
  - 作成装置の情報（General Equipment Module）がセットされていること。
    - ベンダー名称、装置モデル名称、ステーション名

Geometric Planner

- Structure SetをArchiveから受信し、輪郭情報が再現できること。
- Geometric Plan(RT-Plan)をArchiveへ送信出来ること。
- Geometric Planの内容が規定に違反していないこと。
  - Beam情報がひとつ以上セットされていること。
  - Beam　コントロールポイントが2つ以上セットされていること。(1: 照射開始時。2: 照射終了時)
  - Referenced SOP Instance UID(使用するStructure Setのもの)に正しいUIDがセットされていること。
  - 作成装置の情報(General Equipment Module)がセットされていること。
    - ベンダー名称、装置モデル名称、ステーション名

Dosimetric Planner その1

- Geometric Plan、Structure SetをArchiveから受信し、照射情報、輪郭情報が再現できること。
- Dosimetric Plan(RT-Plan)、RT-DoseをArchiveへ送信出来ること。
- Gesimetric Planの内容が規定に違反していないこと。
  - Beam情報がひとつ以上セットされていること。
  - 処方線量等の線量情報がセットされていること。
  - Referenced SOP Instance UID(使用するStructure Setのもの)に正しいUIDがセットされていること。
  - 作成装置の情報（General Equipment Module）がセットされていること。
    - ベンダー名称、装置モデル名称、ステーション名

Dosimetric Planner　その2

- RT-Doseの内容が規定に違反していないこと。
  - 線量分布情報がMulti Frameで記述されていること。
  - Referenced SOP Instance UID(使用するDosimetric Planのもの)に正しいUIDがセットされていること。
  - 作成装置の情報（General Equipment Module）がセットされていること。
    - ベンダー名称、装置モデル名称、ステーション名

Dose Displayer

- Dosimetric Plan、RT-Dose、Structure SetをArchiveから受信し、線量分布、輪郭情報が再現できること。
- Dosimetric Plan、RT-Dose、Structure Setのリンク情報について、オートマチックもしくは、セミオートマチックで指定・設定ができること。
- 線量分布表示が正しく表示できていること。

Archive（RT）

- DICOM（-RT）を受信/保存するサーバーの機能
  - 各アクターからのDICOM（-RT）オブジェクトを受信し、保存できること。
  - 保存できたことを確認できるGUI表示（コマンドラインやSQLでの確認は不可）
- DICOM（-RT）オブジェクトを選択/送信する機能
  - 送信するべきオブジェクトの検索が容易に行え、操作及びその結果表示はGUI上で行えること（コマンドラインやSQLでの検索は不可）
  - インスタンス及びシリーズ単位で送信できること。
    - シリーズ単位でしか送信出来ないのは不可。

最後に

ご静聴ありがとうございました

何かご質問は？