



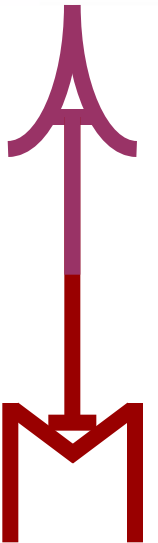
caBIG[™] cancer Biomedical
Informatics Grid [™]

An Initiative of the National Cancer Institute

Using AIM Tools

AIM Template Builder 1.1
AIM Template Service 1.0
AIM Workstation 3.0.4.3

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- **AIM Template Builder (ATB) 1.1**
 - Lexicon (terms to be used in templates)
 - Template (collections of questions and possible answers to each question)
 - Anatomic Entity and its characteristic
 - Imaging Observation and its characteristic
 - Inference
 - Calculation and algorithm
 - Markup
 - Template Group (holds individual templates)
 - Export a template for use
- **AIM Template Service (ATS) 1.0**
 - Publish, Search and Download
 - Search Template Group and Template
 - Administration
- **AIM Workstation 3.0.4.3**
 - Use a template
 - Import a template to AIM-capable imaging workstation
 - Fill-in a template
 - Save an AIM annotation

AIM template is used to define a set of well-defined questions and answer choices to each question to facilitate collecting information for a particular purpose.

An AIM template publication:

Informatics in radiology: an open-source and open-access cancer biomedical informatics grid annotation and image markup template builder, Radiographics, 2012 July; 32(4): 1223-32

AIM Template Builder Concept	Annotation Concept
Component	Item being annotated; for example, Tumor Location. A component can be anatomic entity, imaging observation, inference, calculation, and markup or geometric shape.
Characteristic	Descriptive element of that item; for example, Site of Tumor Center. Only anatomic entity and imaging observation can have characteristics associated with them.
Allowed Term	Represents a possible answer choice. It is used to describe the descriptive element of a component or characteristic. For example, Frontal Lobe is an answer choice for anatomic entity.

Concept	Example
Anatomic Entities	"Occipital lobe", "Parietal lobe", "Medial segment of middle lobe of right lung"
Anatomic Entities Characteristics	"Dilated", "Ruptured", "Fracture"
Imaging Observation	"Mass", "Focus"
Imaging Observation Characteristic	"Speculated", "Rim enhancement", "Cystic"
Inferences	"Speech center involvement", "Pleural effusion", "Pneumonia", "Eloquent brain"

- **AIM Template Builder version 1.1**

- ATB is an implementation of AIM Template as a Java application.
- A user is not required to be an AIM information model expert.
- Software download
 - <https://ncisvn.nci.nih.gov/svn/aim/Releases/ATB/1.1/AimTemplateBuilder-1.1.zip>
 - Uncompress the downloaded file and put it in a directory. The main folder is named "AimTemplateBuilder".
- User's manual
 - <https://wiki.nci.nih.gov/display/AIM/AIM+Template+Builder+User%27s+Guide>
- Support AIM Template schema version 1 revision 23
- Support pre and post-coordinated terms
- Support a question
 - Anatomic Entity
 - Anatomic Entity Characteristic
 - Calculation
 - Geometric Shape (Markup)
 - Imaging Observation
 - Imaging Observation Characteristic
 - Inference

- **Sample lexicons**
 - RadLex
 - caDSR, NCIIt and NCIIm
 - RECIST (from CTEP)
 - LIDC
 - VASARI
- **Manage local lexicons for use in ATB**
 - Create
 - Delete
 - Search
 - Tree view
- **Warning messages when content in a template is incomplete**
 - Shows the location of a warning
 - Cannot export a template with warnings
- **Share AIM Templates with ATS**
 - Upload (requires authentication)
 - Download (public or shared)

Preparing to Create an AIM Template And How to use an AIM Template

- **Write down a use case and a set of questions and possible answers to each question**
 - Since a question and answer are captured as coded elements, a user must know how to obtain codes for questions and answers from standard lexicons or user-defined terms:
 - <http://ncitterms.nci.nih.gov/ncitbrowser>
 - <http://bioportal.bioontology.org/>
 - caDSR, <https://cdebrowser.nci.nih.gov/CDEBrowser/>
 - DICOM Standard 2011 part 16
- **Lexicons Tab in ATB**
 - You need to add required terms in “Lexicons” tab, if required terms are not available in the Lexicons.
- **Create Template**
 - Fill in template information.
 - Add components (anatomic entity, imaging observation, calculation, etc.)
- **Create Template Group**
 - Fill in template group information.
 - Select a template to be included.

- **Use case name: A simple glioblastoma (GBM) template**
 - Create an AIM template example for a GBM MR study.
 - The template shall guide an imaging interpreter to identify and record the lesion location on a GBM study.
 - The template shall provide an instruction to assess percent proportion of edema characteristic.
 - The template shall measure the longest dimension of the lesion and the longest perpendicular diameter to the first measurement.
 - The template shall be labeled with body part (brain) and disease (glioblastoma).

AIM Template – A Use Case Form

M0: Phase I of Temozolomide MRI Assessment Form

General Imaging Information

1. Reader ID :
2. Role In Trial : Performing
 Verifying
3. Date of MRI:
4. Location of Primary
 - Frontal lobe
 - Temporal lobe
 - Insula
 - Parietal lobe
 - Occipital lobe
 - Brainstem
 - Cerebellum
 - Basal Ganglia
 - Thalamus
 - Corpus Callosum
5. Lateralization of Tumor
 - Right
 - Left
 - Center/Bilateral
6. Imaging Observation Characteristic
 - Greater than two thirds
 - Between two thirds and one third
 - Less than one third
 - Minimal
 - No contrast enhancement
 - No contrast injected

7. Eloquent Brain

- None
- Motor
- Vision
- Speech Receptive
- Speech Motor

8. Measurement of the longest dimension of the tumor mm

9. Measurement of the longest perpendicular dimension of the tumor mm



Template Components

VASARI_caDSR (ver.1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...))
 - Anatomic Entity
 - Allowed Term: Frontal lobe
 - Allowed Term: Insula
 - Allowed Term: Occipital lobe
 - Allowed Term: Parietal lobe
 - Allowed Term: Temporal lobe
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
 - Question: Where is the location of the tumor?
 - Imaging Observation
 - Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Lesion Alteration Vascular Edema Proportion Category
 - Characteristic Quantification: Percent Proportion of Edema Characteristic Quantification
 - Non-Quantifiable: Greater than two thirds
 - Non-Quantifiable: Between Two Thirds and One Third
 - Non-Quantifiable: Less than One Third
 - Non-Quantifiable: Minimal
 - Non-Quantifiable: No Contrast Enhancement
 - Non-Quantifiable: No Contrast Injected
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)
 - Question: Eloquent Brain
 - Inference
 - Allowed Term: Motor
 - Allowed Term: None
 - Allowed Term: Vision
 - Allowed Term: Speech Receptive
 - Allowed Term: Speech Motor
- Draw a line to measure the longest diameter (min:2 max:2 Find an image with the largest lesion size and
- Calculate the longest diameter (min:1 max:1 Calculate the longest diameter)
- Draw a line to measure a longest perpendicular diameter (min:2 max:2 Draw a line to measure the longe
- Calculate the longest perpendicular diameter (min:1 max:1 Calculate the longest perpendicular diameter)
- Body Part / Brain
- Disease / Glioblastoma

We want to create a case report form (CRF) to an AIM template.

AIM Template – A Use Case Form (cont.)

M0: Phase I of Temozolomide MRI Assessment Form

General Imaging Information	7. Eloquent Brain
1. Reader ID: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> None
2. Role In Trial: <input type="checkbox"/> Performing <input type="checkbox"/> Verifying	<input type="checkbox"/> Motor
3. Date of MRI: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Vision
4. Location of Primary	<input type="checkbox"/> Speech Receptive
<input type="checkbox"/> Frontal lobe <input type="checkbox"/> Temporal lobe <input type="checkbox"/> Insula <input type="checkbox"/> Parietal lobe <input type="checkbox"/> Occipital lobe <input type="checkbox"/> Brainstem <input type="checkbox"/> Cerebellum <input type="checkbox"/> Basal Ganglia <input type="checkbox"/> Thalamus <input type="checkbox"/> Corpus Callosum	<input type="checkbox"/> Speech Motor
5. Lateralization of Tumor	8. Measurement of the longest dimension of the tumor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> mm
<input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Center/Bilateral	9. Measurement of the longest perpendicular dimension of the tumor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> mm
6. Imaging Observation Characteristic	
<input type="checkbox"/> Greater than two thirds <input type="checkbox"/> Between two thirds and one third <input type="checkbox"/> Less than one third <input type="checkbox"/> Minimal <input type="checkbox"/> No contrast enhancement <input type="checkbox"/> No contrast injected	

Where to obtain codes

AIM WS & DICOM Header

caDSR

Private

RadLex

caDSR

caDSR

Private

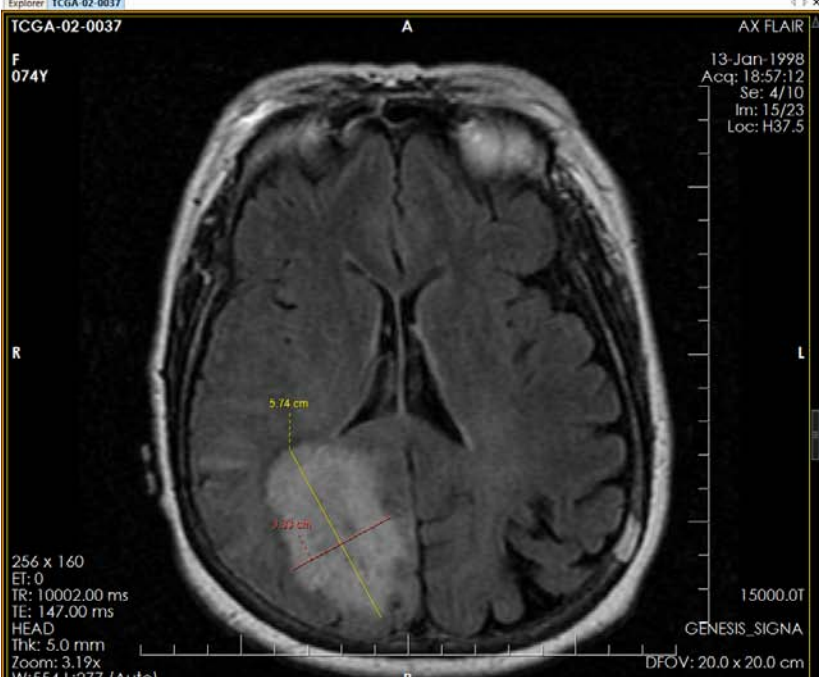
Import an AIM Template to a Workstation

Explorer TCGA-02-0037

TCGA-02-0037 AX FLAIR

F 074Y

13-Jan-1998
Acq: 18:57:12
Se: 4/10
Im: 15/23
Loc: H37.5



256 x 160
ET: 0
TR: 10002.00 ms
TE: 147.00 ms
HEAD
Thk: 5.0 mm
Zoom: 3.19x
W:554 L:277 (Auto)

GENESIS_SIGNA
DFOV: 20.0 x 20.0 cm

AIM Annotation

AIM Template: Brain Tumor Measurement(PRI-VASARI-1)

Annotation Name:
TCGA-02-0037_NU_2012-08-04 15:01 PM

Tumor Location
Parietal lobe
Confidence: 1.00

Side of Tumor Center
Right

Where is the location of the tumor?
Lesion Alteration Vascular Edema Proportion Category
Name: Percent Proportion of Edema Characteristic Quantification
Less than One Third

Eloquent Brain
None

Draw a line to measure longest diameter.
MultiPoint Min: 2 Max: 2

What is the longest diameter?

Draw a line along the longest perpendicular diameter
MultiPoint Min: 2 Max: 2

What is the longest perpendicular diameter?

Create Annotation User Info



Template Components

VASARI_caDSR (ver: 1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min: 1 max: 1 Location of lesion geographic center (not all areas of involvement).
 - Anatomic Entity
 - Allowed Term: Frontal lobe
 - Allowed Term: Insula
 - Allowed Term: Occipital lobe
 - Allowed Term: Parietal lobe
 - Allowed Term: Temporal lobe
 - Question: Where is the location of the tumor?
 - Imaging Observation
 - Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Lesion Alteration Vascular Edema Proportion Category
 - Characteristic Quantification: Percent Proportion of Edema Characteristic Quantification
 - Non-Quantifiable: Greater than two thirds
 - Non-Quantifiable: Between Two Thirds and One Third
 - Non-Quantifiable: Less than One Third
 - Non-Quantifiable: Minimal
 - Non-Quantifiable: No Contrast Enhancement
 - Non-Quantifiable: No Contrast Injected

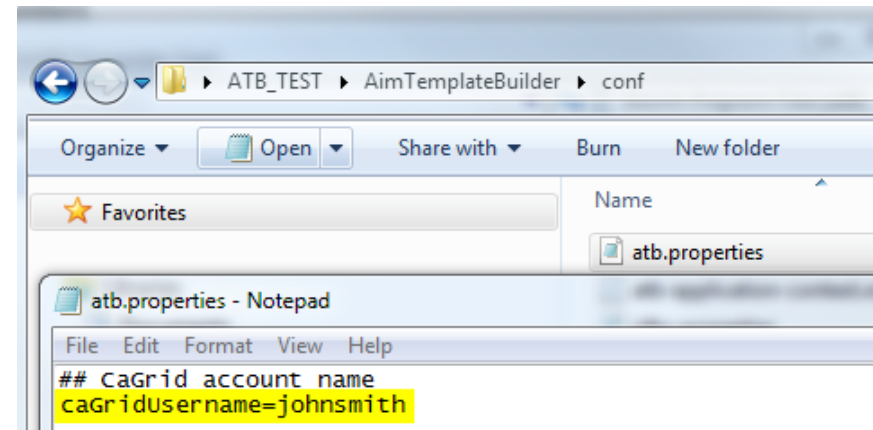
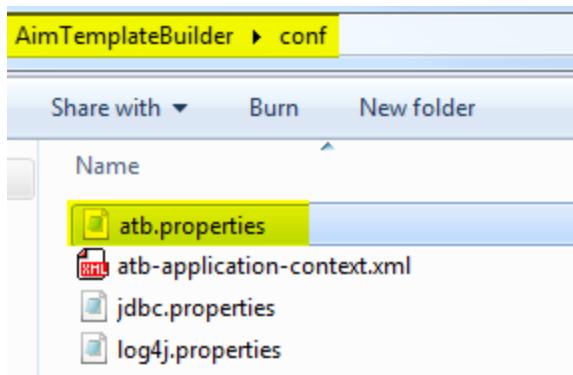
- Eloquent Brain (min: 1 max: 1 Select Eloquent brain involvement feature)
- Question: Eloquent Brain
 - Inference
 - Allowed Term: Motor
 - Allowed Term: None
 - Allowed Term: Vision
 - Allowed Term: Speech Receptive
 - Allowed Term: Speech Motor
- Draw a line to measure the longest diameter (min: 2 max: 2 Find an image with the largest lesion size and
- Calculate the longest diameter (min: 1 max: 1 Calculate the longest diameter)
- Draw a line to measure a longest perpendicular diameter (min: 2 max: 2 Draw a line to measure the longest
- Calculate the longest perpendicular diameter (min: 1 max: 1 Calculate the longest perpendicular diameter,
- Body Part / Brain
- Disease / Glioblastoma

Start Using ATB

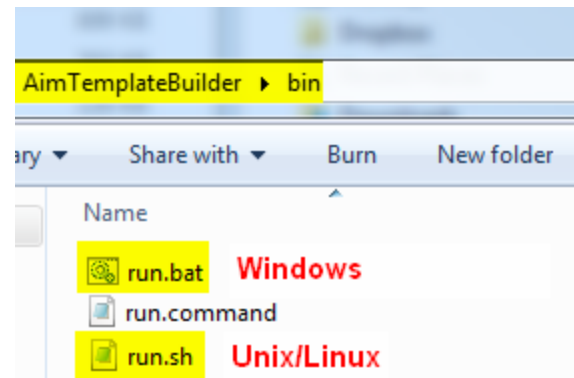
ATB Configuration

- **Configuration file to change author's name**

- “conf” folder
- “atb.properties”



Run The AIM Application



Windows : double-click on “run.bat”

Working with Lexicons And Preparing Terms for Use

ATB - Lexicons

Template Groups | Templates | Lexicons

Lexicons

Name ^	Term Count
Algorithm-Private	1
Algorithm-DICOM	4
caDSR	10
DICOM	10
LIDC	55
NCI	5
Questions and instructions	3
Radlex	35860
RECIST	32
SNOMED_CT	5
Vasari	20
VASARI Template	2

Lexicon Terms

- (1) caDSR
 - (2) Greater than two thirds
 - (2) Between Two Thirds and One Third
 - (2) Less than One Third
 - (2) Minimal
 - (2) No Contrast Enhancement
 - (2) No Contrast Injected
 - (2) Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm
 - (2) Center/Bilateral
 - (2) Left
 - (2) Right

Code Meaning* : Breast and Ovarian Analysis of Disease Inciden

Description : A risk model for familial breast and ovarian cancer. It can be used to compute BRCA1 and BRCA2 mutation carrier probabilities and age specific risks for breast and ovarian cancer. (University of Cambridge, 2009 Genetic Epidemiology Unit)

Code Value* : CL422105

Created : 12:20 2012-08-01

Modified :

Buttons:

- Lexicon Actions: + (Add new lexicon), X (Delete selected lexicon), 🔍 (Search for a term in a lexicon), 🔄 (Import/Export a lexicon)
- Term Actions: T (Add a new term), X (Delete a selected term)

Save (with green checkmark icon)

AIM – Lexicons – NCI – caDSR

- Looking for Terms from NCI CDE Browser, <https://cdebrowser.nci.nih.gov/CDEBrowser/>
- “caDSR” schema designator

<input type="checkbox"/>	Lesion Brain Foci Side Type	Side of lesion epicenter	caBIG		RELEASED	2890972	1.0
<input type="checkbox"/>	Lesion Substance Morphology Contrast-enhanced MRI Quality Type	Enhancement Quality	caBIG		RELEASED	2891769	1.0

[Data Element](#) | [Data Element Concept](#) | **[Value Domain](#)** | [Classifications](#) | [Usage](#) | [Data Element Derivation](#)

Selected Data Element

Public ID:	2890972
Version:	1.0
Long Name:	Lesion Brain Foci Side Type
Short Name:	2890969v1.0:2890966v1.0
Preferred Question Text:	Side of lesion epicenter
Definition:	Side of lesion epicenter irrespective of whether the lesion crosses into the contralateral hemisphere.
Workflow Status:	RELEASED

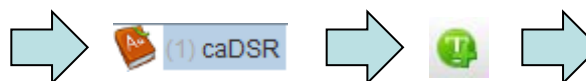
Permissible Values

NCI 1 - 3 of 3

PV	PV Meaning	PV Meaning Concept Codes	PV Meaning Description	PV Begin Date	PV End Date	VM Public ID	VM Version
Center/Bilateral	Bilateral Center	C13332;C25445 (Primary)	Affecting both sides of the body, or a matched pair of organs.: A point or area that is approximately central within some larger region or structure.	2009-05-27		3262715	1.0
Left	Left	C25229	Left; being or located on or directed toward the side of the body to the west when facing north.	2009-05-27		2574089	1.0
Right	Right	C25228	Right; being or located on or directed toward the side of the body to the east when facing north.	2009-05-27		2574088	1.0

- Add a “Lexicon” and a “Term”

Name*: caDSR
 Schema Designator*: caDSR
 Schema Version: 1.0
 Description: A collection of codes from caDSR.
 Authors: NCI



Code Meaning*: Center/Bilateral
 Description: Affecting both sides of the body, or a matched pair of organs.: A point or area that is approximately central within some larger region or structure.
 Code Value*: 3262715
 Created: 02:41 2012-08-01
 Modified:

AIM – Lexicons – NCI – caDSR (cont.)

- Looking for Terms from NCI CDE Browser, <https://cdebrowser.nci.nih.gov/CDEBrowser>

<ul style="list-style-type: none"> Transcription Annotation Prioritization a UAMS Clinical Research University of Michigan Utah VASARI 	<input type="checkbox"/> Long Name <input checked="" type="checkbox"/> Lesion Alteration Vascular Edema Proportion Category <input type="checkbox"/> Lesion Brain Foci Anatomic Site	Preferred Question Text Proportion of Edema Tumor Location	Owned By caBIG caBIG	Used By Context 	Registration Status 	Workflow Status RELEASED RELEASED	Public ID 2904274 2904260	Version 1.0 1.0
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- Add terms to “Lexicons”

Permissible Values

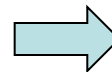
1 - 6 of 6

PV	PV Meaning	PV Meaning Concept Codes	PV Meaning Description	PV Begin Date	PV End Date	VM Public ID	VM Version
> Two Thirds	Greater than Two Thirds		Greater than Two Thirds	2011-08-16		3262723	1.0
Between Two Thirds and One Third	Between Two Thirds and One Third		Between Two Thirds and One Third	2011-08-16		3262722	1.0
Less than One Third	Less than One Third		Less than One Third	2011-08-16		3262721	1.0
Minimal	Minimal		Present in less than five percent of tissue	2011-08-16		3227238	1.0
No Contrast Enhancement	No Contrast Enhancement		No Contrast Enhancement	2011-08-16		3262719	1.0
No Contrast Injected	No Contrast Injected		It appears that contrast was not injected.	2011-08-16		3262720	1.0

Data Element | Data Element Concept | Value Domain | Classifications | Usage | Data Element Derivation

Data Element Details

Public ID:	2904274
Version:	1.0
Long Name:	Lesion Alteration Vascular Edema Proportion Category
Short Name:	2904056v1.0.2891699v1.0
Preferred Question Text:	Proportion of Edema
Definition:	Visually, when scanning through the entire tumor volume, what proportion of the entire abnormality is estimated to represent vasogenic edema? Edema should be greater in signal than nCET and somewhat lower in signal than CSF. Pseudopods are characteristic of edema. (Assuming that the entire abnormality may be comprised of: (1) an enhancing component, (2) a non-enhancing component, (3) a necrotic component and (4) a edema component.)



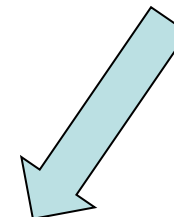
Template Groups | Templates | Lexicons

Name	Term Count
Algorithm-Private	1
Algorithm-DICOM	4
caDSR	10
DICOM	10
LIDC	55
NCI	5
Questions and instructions	3
Radlex	35860
RECIST	32

Lexicon Terms

(1) caDSR

- (2) Greater than two thirds
- (2) Between Two Thirds and One Third
- (2) Less than One Third
- (2) Minimal
- (2) No Contrast Enhancement
- (2) No Contrast Injected



AIM – Lexicons – NCI – NCIIt (cont.)

NCI Term Browser

Version 2.1.1 (using LexEVS 6.0)

Algorithm

Exact Match
 Begins With
 Contains

Name/Code
 Property
 Relationship

Sources | Visited Concepts

Quick Links

Result for: Algorithm

Results 1-37 of 37 for: Algorithm from [selected vocabularies](#).

Concept	Vocabulary
Algorithm	NCI Thesaurus (12.06d)
algorithm	NCI Metathesaurus (2012_03)
algorithm	HL7 (V3 02-36)
NAACCR hispanic identification algorithm hispanic origin.Prid.Pt*Patient.Nom.Derived	LOINC (234)
algorithm	OBI (OBI San Diego 2011 Release)
sharp_kernel	RadLex (3_33)
Swedish interactive thresholding algorithm automated static perimetry	SNOMED CT (2011_0731)
diagnostic algorithm	NCI Metathesaurus (2012_03)
secure hash algorithm - 256	HL7 (V3 02-36)
NAACCR hispanic identification algorithm hispanic origin	LOINC (234)
ARACNE Algorithm	NCI Thesaurus (12.06d)
Data Compression	NCI Metathesaurus (2012_03)
secure hash algorithm - 1	HL7 (V3 02-36)
probabilistic algorithm	OBI (OBI San Diego 2011 Release)
IntegrityCheckAlgorithm	HL7 (V3 02-36)
smooth_kernel	RadLex (3_33)
ELECTROCARDIOGRAPH_AMBULATORY_WITH_ANALYSIS_ALGORITHM	NCI Metathesaurus (2012_03)
CompressionAlgorithm	HL7 (V3 02-36)
Compress Algorithm	NCI Thesaurus (12.06d)
Swedish interactive thresholding algorithm automated static perimetry	NCI Metathesaurus (2012_03)
Deflate Algorithm	NCI Thesaurus (12.06d)
FFAS Algorithm	NCI Thesaurus (12.06d)
Genetic Programming	NCI Thesaurus (12.06d)
HmmPfam Algorithm	NCI Thesaurus (12.06d)
Incorrect Device Software Algorithm Evaluation Result	NCI Thesaurus (12.06d)
SEG Algorithm	NCI Thesaurus (12.06d)
SignalP Algorithm	NCI Thesaurus (12.06d)
TmHMM Algorithm	NCI Thesaurus (12.06d)
bzip2 Algorithm	NCI Thesaurus (12.06d)
Data Compression	NCI Thesaurus (12.06d)
Expectation Maximization Algorithm	NCI Thesaurus (12.06d)
Gel Warping Algorithm	NCI Thesaurus (12.06d)
zlib Compression	NCI Thesaurus (12.06d)
Hidden Markov Model Forward Algorithm	NCI Thesaurus (12.06d)
Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm	NCI Thesaurus (12.06d)
Secure Hash Algorithm-256	NCI Thesaurus (12.06d)
Secure Hash Algorithm-1	NCI Thesaurus (12.06d)



1. Search NCIIt for “Algorithm”
2. Select “Breast and Ovarian...”
3. Add new term to “NCIIt”

NCIthesaurus
Version: 12.06d (Release date: 2012-06-25-08:00)

Exact Match
 Begins With
 Contains

Name/Code
 Property
 Relationship

[Back to search results](#)
[Advan](#)

[Hierarchy](#) | [Value Sets](#) | [Maps](#) | [Visited Concepts](#)

Quick Links

[View in Hierarchy](#) | [View History](#) | [Add to Cart](#) | [Sugges](#)

Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm (Code C91784)

[Terms & Properties](#)
[Synonym Details](#)
[Relationships](#)
[Mappings](#)
[View All](#)

Terms & Properties

Preferred Name: **Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm**

Definition: **A risk model for familial breast and ovarian cancer. It can be used to compute BRCA1 and BRCA2 mutation carrier probabilities and age specific risks for breast and ovarian cancer. (University of Cambridge, 2009 Genetic Epidemiology Unit)**

Label: Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm

NCI Thesaurus Code: **C91784** ([Search for linked caDSR metadata](#))

NCI Metathesaurus CUI: CL422105 ([see NCI Metathesaurus info](#))



Template Groups | Templates | Lexicons

Lexicons	Name	Term Count
Algorithm-Private		1
Algorithm-DICOM		4
caDSR		14
DICOM		10
LIDC		55
NCIm		7
NCIIt		1
Questions and instructo...		5
Radlex		35860
RECIST		32
SNOMED_CT		5
Vasari		20
VASARI Template		5

Lexicon Terms

(1) NCIIt

Breast and Ovarian Analysis of Disease Incidence and

Code Meaning*: **Breast and Ovarian Analysis of Disease Inciden**

Description: **A risk model for familial breast and ovarian cancer. It can be used to compute BRCA1 and BRCA2 mutation carrier probabilities and age specific risks for breast and ovarian cancer. (University of Cambridge, 2009 Genetic Epidemiology Unit)**

Code Value*: **C91784**

Created: 07:56 2012-08-03

Modified:

ATB – Lexicon – DICOM 2011 Part 16

CID 6144 RECIST Response Criteria

Context ID 6144
 RECIST Response Criteria
 Type: Extensible Version: 20030108

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	112041	Target Lesion Complete Response
DCM	112042	Target Lesion Partial Response
DCM	112043	Target Lesion Progressive Disease
DCM	112044	Target Lesion Stable Disease
DCM	112045	Non-Target Lesion Complete Response
DCM	112046	Non-Target Lesion Incomplete Response or Stable Disease
DCM	112047	Non-Target Lesion Progressive Disease

CID 6145 Baseline Category

Context ID 6145
 Baseline Category
 Type: Extensible Version: 20030108

Note: From RECIST

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
DCM	112074	Target Lesion at Baseline
DCM	112075	Non-Target Lesion at Baseline
DCM	112076	Non-Lesion at Baseline

Template Groups
Templates
Lexicons

Lexicons

Name ▲	Term Count
Algorithm-Private	1
Algorithm-DICOM	4
caDSR	10
DICOM	10
LIDC	55
NCI	5
Questions and instructions	3
Radlex	35860
RECIST	32
SNOMED_CT	5
Vasari	20
VASARI Template	2

Lexicon Terms

Add (1) DICOM

- T (2) Target Lesion Complete Response
- T (2) Target Lesion Partial Response
- T (2) Target Lesion Progressive Disease
- T (2) Target Lesion Stable Disease
- T (2) Non-Target Lesion Complete Response
- T (2) Non-Target Lesion Incomplete Response or Stable Disease
- T (2) Non-Target Lesion Progressive Disease
- T (2) Target Lesion at Baseline
- T (2) Non-Target Lesion at Baseline
- T (2) Non-Lesion at Baseline

Name* :

Schema Designator* :

Schema Version :

Description :

Authors :

Is Read-only :

Created :

Creating an AIM Template

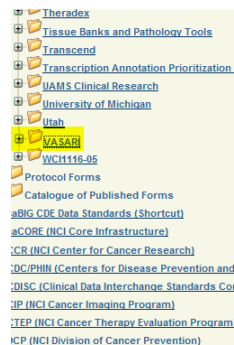
Create an AIM Template Use Case Example

VASARI

- Template Container
- Template
 - Anatomic Entity
 - Tumor location
 - Frontal lobe, Temporal lobe, Insula, Parietal lobe, Occipital lobe, Brainstem, Cerebellum, Basal Ganglia, Thalamus, Corpus Callosum (RadLex)
 - Characteristic
 - Right, Center/Bilateral, Left (SNOMED CT)
 - Imaging Observation
 - Mass (RadLex)
 - Imaging Observation Characteristic (caDSR)
 - <https://cdebrowser.nci.nih.gov/CDEBrowser/> -> Classifications
 - caBIG (NCI cancer Biomedical Informatics Grid)
 - VASARI

Markup

- Longest diameter
- Longest perpendicular diameter



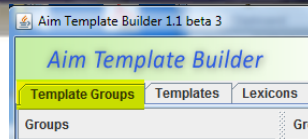
Sort order: (Default) Registration Status>>Workflow Status>>Long Name [Ascending]

[Add to CDE Cart](#) [Add to CDE compare list](#) [Compare CDEs](#)

Long Name	Preferred Question Text	Owned By	Used By Context	Registration Status	Workflow Status	Public ID	Version
<input type="checkbox"/> Lesion Alteration Vascular Edema Proportion Category	Proportion of Edema	caBIG			RELEASED	2904274	1.0
<input type="checkbox"/> Lesion Brain Foci Anatomic Site	Tumor Location	caBIG			RELEASED	2904260	1.0
<input type="checkbox"/> Lesion Brain Foci Side Type	Side of lesion epicenter	caBIG			RELEASED	2890972	1.0
<input type="checkbox"/> Lesion Substance Morphology Contrast-enhanced MRI Quality Type	Enhancement Quality	caBIG			RELEASED	2891769	1.0
<input type="checkbox"/> Lesion Substance Morphology Cyst Yes No Indicator	Cysts	caBIG			RELEASED	2891773	1.0
<input type="checkbox"/> Lesion Substance Morphology Enhancing Proportion Category	Proportion Enhancing	caBIG			RELEASED	2904265	1.0
<input type="checkbox"/> Lesion Substance Morphology Necrosis Proportion Category	Proportion Necrosis	caBIG			RELEASED	2891771	1.0
<input type="checkbox"/> Lesion Substance Morphology Region Type	Multifocal or Multicentric	caBIG			RELEASED	2903542	1.0
<input type="checkbox"/> Lesion Substance Morphology T1 FLAIR Ratio Abnormality Category	T1/FLAIR RATIO	caBIG			RELEASED	2932328	1.0

Create an AIM Template Container


1. Template Groups
2. Add a new template group
3. Fill in the required attributes



Name*: ATB-VASARI-Example
Version*: 1.4
Description*: This template is used by an application program to present imaging interpreters with available questions and answer choices for evaluating brain tumor studies.
Authors: UserA
UID*: 2.25.234308535339829963002466314639387168766
Date: 2012-07-31

4. Selecting template(s)

Warning

Groups	Name ^	Date
	VASARI	2012-07-29
	VASARI Template	2011-07-03
	VASARI Template Group	2011-07-03
	VASARI Template Test	2011-07-03

Group Members

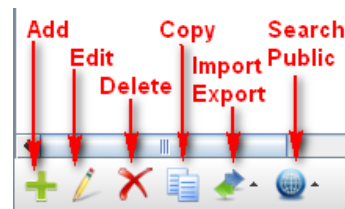
Group: VASARI
Authors: ATB_USER Date: 2012-07-29 Version: 1.0
UID: 2.25.121706379317633557816771548855139199190
Description: This template is used by an application program to present readers at

Group Memberships	Name ^
<input type="checkbox"/>	LIDC_CR_DR
<input type="checkbox"/>	LIDC CT
<input type="checkbox"/>	VASARI_7
<input type="checkbox"/>	VASARI_9
<input type="checkbox"/>	VASARI_ONE
<input type="checkbox"/>	VASARI_THREE_5

5. Save templates(s)

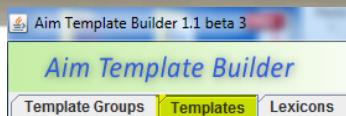


6. Functionalities



Create an AIM Template

1. Template



2. Add a new template



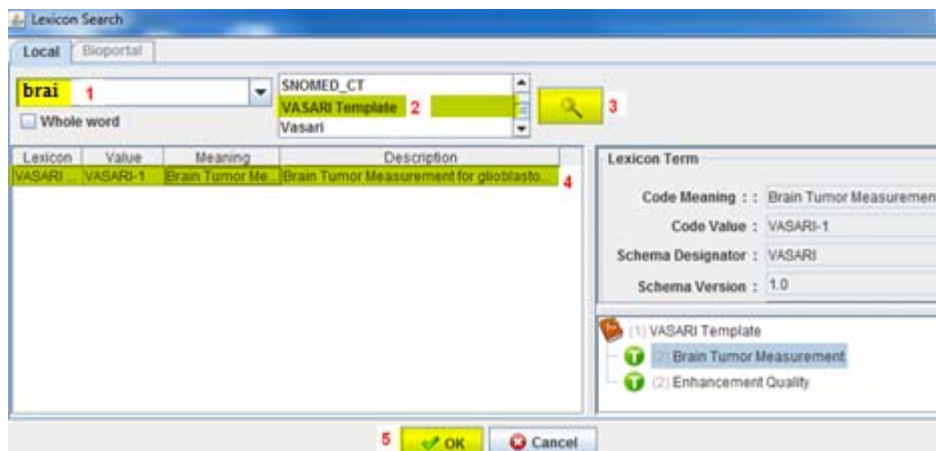
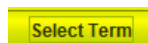
3. Fill in required information



Name*: VASARI_caDSR
Description*: This is an AIM template example using VASARI information from caDSR.
Authors: UserA
Modality: MR
Preceding Annotation:
UID*: 2.25.24.15762173256772686031170507
Date: 2011-07-11
Version*: 1.0

Note: Red arrows labeled 'Autofill' point to the Author, Preceding Annotation, and UID fields.

4. Select template description



Name*: VASARI_caDSR
Description*: This is a VASARI template using caDSR imaging characteristics.
Authors: ATB_USER
Modality: MR
Preceding Annotation:
UID*: 2.25.5929669186689976026654654202
Date: 2012-07-29
Version*: 1.0

Lexicon Term
Code Meaning*: Brain Tumor Measurement
Code Value*: VASARI-1
Schema Designator*: VASARI
Schema Version: 1.0

Select Term

Save

5. Save



AIM Template – Image Finding (Anatomy)

1. Add an “anatomy”



Template Groups	Templates	Lexicons
Templates		
Name	Date	
LIDC_CR_DR	2011-07-10	
LIDC_CT	2011-07-10	
VASARI_7	2011-07-11	
VASARI_9	2011-07-11	
VASARI_caDSR	2012-07-24	
VASARI_ONE	2011-07-10	
VASARI_THREE	2011-07-10	

2. Fill in anatomy information



Label*: **Tumor Location**

Explanatory Text: Location of lesion geographic center (not all areas of involvement).

Cardinality*: 1 min to 1 max
 Unlimited

Should Display*:

Authors: ATB_USER

Group Label:

Save

3. Assign anatomic entity



4. Select

VASARI_caDSR (ver.1.0 This is a VASARI template using caDSR in...)

Tumor Location (min:1 max:1 Location of lesion geographic center...)

5. Create a question to associate with the anatomic entity



Template Components

- VASARI_caDSR (ver.1.0 This is a VASARI template using caDSR imaging characteristics.)
 - Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvement...))
 - Question
 - Anatomic Entity

Lexicon Term

Code Meaning*:
 Code Value*:
 Schema Designator*:
 Schema Version: **Select Term**

Select a term for the question.

1: whe
 Whole word

2: Question
 RECI

Lexicon	Value	Meaning	Description
Question	QT-09827	Where is the tu...	A question about tumor location.

3: [Selected Term]

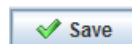
Lexicon Term

Code Meaning: Where is the tumor locatio
 Code Value: QT-09827
 Schema Designator: Private
 Schema Version:

(1) Question
 (2) Where is the tumor location?
 (2) Draw a longest diameter.

4: **OK** **Cancel**

6. Click “Save”



AIM Template (anatomy cont.)

7. Add “Allowed Term” for “Tumor Location”

Template Components

VASARI_caDSR (ver. 1.0 This is a VASARI template using caDSR)

- Tumor Location (min: 1 max: 1 Location of lesion geographic c...
- Question: Where is the tumor location?
- Anatomic Entity

Description

Component should contain at least one Allowed Term

8. Search for “frontal lobe” from “Radlex”

frontal lobe 2

RECIST Radlex 1 SNOMED_CT

Whole word

Lexicon	Value	Meaning	Description
Radlex	RID26473	orbitofrontal segment o...	
Radlex	RID26472	orbitofrontal segment o...	
Radlex	RID26475	superolateral segment...	
Radlex	RID26474	superolateral segment...	
Radlex	RID26482	orbitobasal segment of...	
Radlex	RID26481	orbitobasal segment of...	
Radlex	RID26480	orbitobasal segment of...	
Radlex	RID26486	superior mesial segm...	
Radlex	RID26485	inferior mesial segme...	
Radlex	RID26484	inferior mesial segme...	
Radlex	RID26483	inferior mesial segme...	
Radlex	RID26488	superior mesial segm...	
Radlex	RID26487	superior mesial segm...	
Radlex	RID26491	subgyral segment of ri...	
Radlex	RID26490	subgyral segment of fr...	
Radlex	RID26492	subgyral segment of le...	
Radlex	RID26519	gyrus of frontal lobe	
Radlex	RID26001	brodmann area 10 of ri...	
Radlex	RID26002	brodmann area 10 of l...	
Radlex	RID26000	brodmann area 10 of fr...	
Radlex	RID22699	segment of cortex of gy...	
Radlex	RID26771	gray matter of orbitoba...	
Radlex	RID26772	gray matter of orbitoba...	
Radlex	RID26773	gray matter of orbitoba...	
Radlex	RID26604	segment of gyrus of fro...	
Radlex	RID6440	frontal lobe 4	Frontal lobe is the anterior-r...

Value Meaning
RID6440 frontal lobe

Lexicon Term

Code Meaning : : frontal lobe

Code Value : RID6440

Schema Designator : RadLex

Schema Version : 1.0

Description : Frontal lobe is the anterior-most of five lobes of the cerebral hemisphere. It is bounded by the

- (15) segment of cerebral
- (15) lobe of cerebral hem
- frontal lobe
- (16) parietal lobe
- (16) temporal lobe
- (16) insula
- (16) occipital lobe
- (16) limbic lobe
- (15) gyrus of brain

6 OK Cancel

← Add multiple terms



VASARI_caDSR (ver. 1.0 This is a VASARI template using caDSR ir)

- Tumor Location (min: 1 max: 1 Location of lesion geographic c...
- Question: Where is the tumor location?
- Anatomic Entity
- Allowed Term: frontal lobe
- Allowed Term: temporal lobe
- Allowed Term: insula
- Allowed Term: parietal lobe
- Allowed Term: occipital lobe
- Allowed Term: brainstem
- Allowed Term: cerebellum
- Allowed Term: basal ganglia
- Allowed Term: thalamus
- Allowed Term: corpus callosum

No error or warning

Description

AIM Template (anatomy cont.)

9. Add Anatomic Entity Characteristic



Template Components

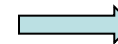
- VASARI_caDSR (ver. 1.0 This is a VASARI templ
- Tumor Location (min:1 max:1 Location of les
 - Question: Where is the tumor location?
 - Anatomic Entity 1
 - Allowed Term: frontal lobe
 - Allowed Term: temporal lobe

Descripti



Anatomic Entity

Anatomic Entity Characteristic: Side of lesion epicenter



Label*: Side of lesion epicenter

Explanatory Text: Side of lesion epicenter irrespective of whether the lesion crosses into the contralateral hemisphere.

Cardinality*: 1 min to 1 max
 Unlimited

Should Display*:

Annotator Confidence*:

Authors: ATB_USER

Group Label:

10. Add "Allowed Term" search for "cen"



Local Biportal

VASARI Template Vasari

caDSR 1

Whole word

caDSR 1

Lexicon	Value	Meaning	Description
caDSR	3262715	Center/Bilateral	Affecting both sides of the body, or a matc...

Lexicon Term

Code Meaning: Right

Code Value: 2574088

Schema Designator: caDSR

Schema Version: 1.0

Description: Right, being or located on or directed toward the side of the body to the east when facing north.

Allowed Terms

Value	Meaning
2574088	Right
2574089	Left
3262715	Center/Bilateral

Center/Bilateral

Left

Right

OK Cancel



Tumor Location (min:1 max:1 Location of lesion geographic ce

Question: Where is the tumor location?

Anatomic Entity

Anatomic Entity Characteristic: Side of lesion epicenter

Allowed Term: Left

Allowed Term: Right

Allowed Term: Center/Bilateral

AIM Template – Image Finding (Observation)

1. Add an “Imaging Observation” 



Templates		Template Components
Name	Date	
LIDC_CR_DR	2011-07-10	VASARI_caDSR (ver.1.0 This is an AIM template example using VASARI information)
LIDC_CT	2011-07-10	Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas))
VASARI_7	2011-07-11	
VASARI_9	2011-07-11	
VASARI_caDSR	2011-07-11	
VASARI_ONE	2011-07-10	

2. Fill in imaging observation information. “Should Display” is unchecked because “mass” is the only option.



Label*:

Explanatory Text:

Cardinality*: min to max
 Unlimited

Should Display*:

Authors:

Group Label:

3. Assign Imaging Observation 

4. Select

VASARI_caDSR (ver.1.0 This is a VASARI template using caDSR information)

Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas))

5. Create a question to associate with the anatomic entity 

Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)

Question: 

Imaging Observation



where 1 NCI Question 2 RECAST

Whole word

Select a term for the question.

Lexicon	Value	Meaning	Description
Question	QT-09827	Where is the tu...	A question about tumor location. 3

Lexicon Term

Code Meaning : : Where is the tumor location

Code Value : QT-09827

Schema Designator : Private

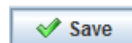
Schema Version :

(1) Question

(2) Where is the tumor location?

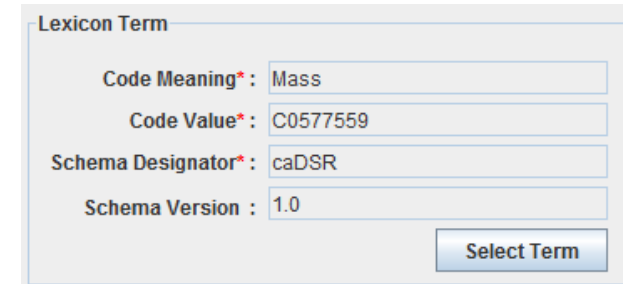
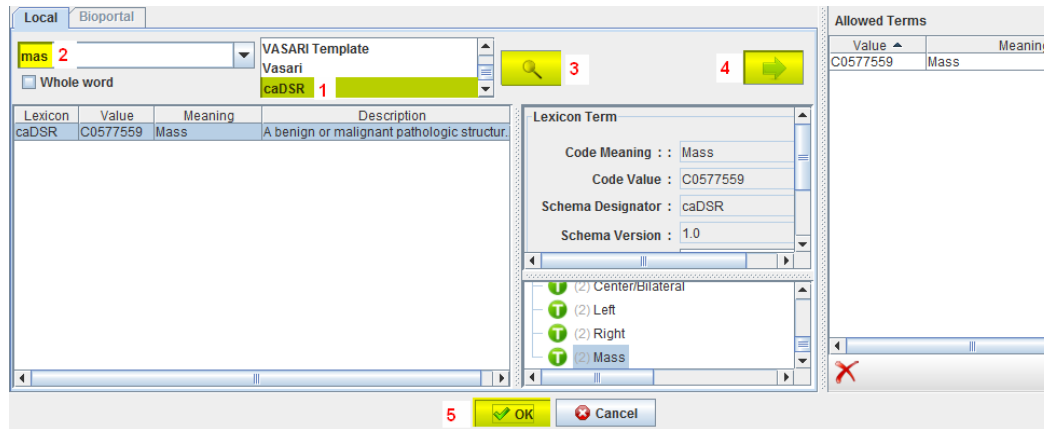
(2) Draw a longest diameter.

6. Click “Save”



AIM Template – Image Finding (Observation) (cont.)

7. Add “Allowed Term”



Lexicon Term

Code Meaning* : Mass

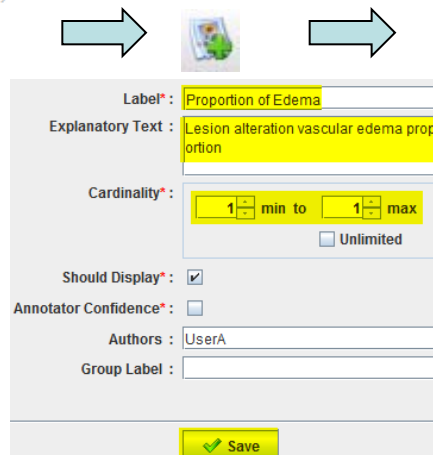
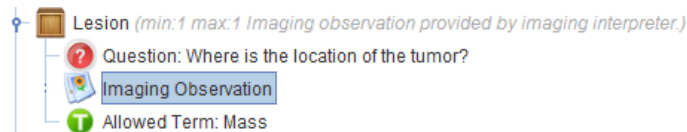
Code Value* : C0577559

Schema Designator* : caDSR

Schema Version : 1.0

Select Term

8. Add “Imaging observation characteristic”



Label* : Proportion of Edema

Explanatory Text : Lesion alteration vascular edema proportion

Cardinality* : 1 min to 1 max

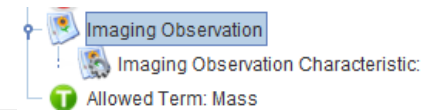
Should Display* :

Annotator Confidence* :

Authors : UserA

Group Label :

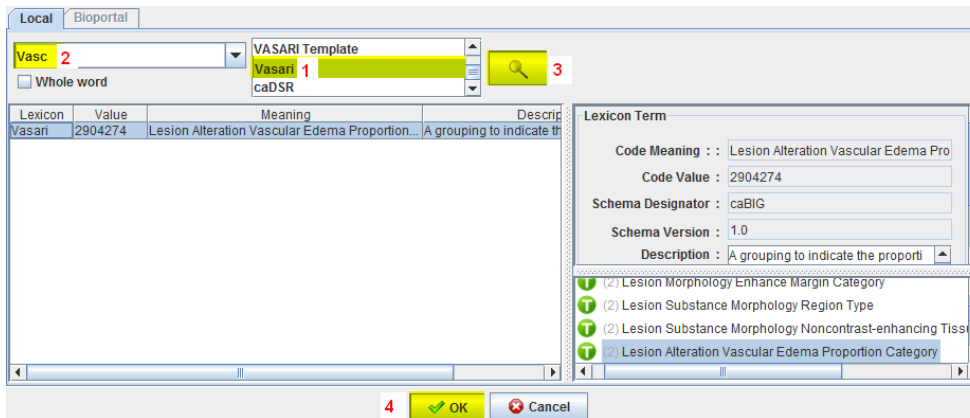
Save



Fill in imaging observation information

AIM Template – Observation characteristic (cont.)

9. Assign question



Local Bioportal

Vasc: 2 VASARI Template

Whole word Vasari 1 caDSR 3

Lexicon	Value	Meaning	Description
Vasari	2904274	Lesion Alteration Vascular Edema Proportion...	A grouping to indicate th

Lexicon Term

Code Meaning : Lesion Alteration Vascular Edema Pro

Code Value : 2904274

Schema Designator : caBIG

Schema Version : 1.0

Description : A grouping to indicate the proport

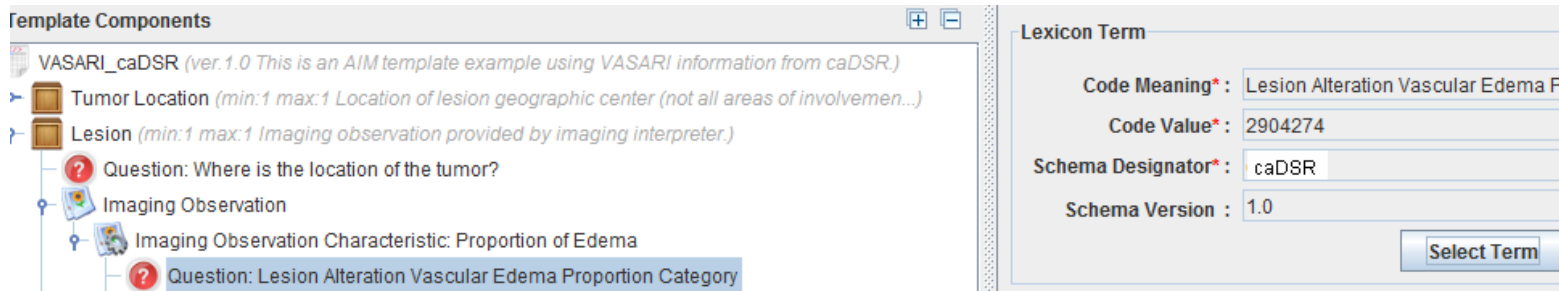
(2) Lesion Morphology Enhance Margin Category

(2) Lesion Substance Morphology Region Type

(2) Lesion Substance Morphology Noncontrast-enhancing Tiss

(2) Lesion Alteration Vascular Edema Proportion Category

4 OK Cancel



Template Components

VASARI_caDSR (ver.1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...))
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
 - Question: Where is the location of the tumor?
 - Imaging Observation
 - Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category

Lexicon Term

Code Meaning*: Lesion Alteration Vascular Edema P

Code Value*: 2904274

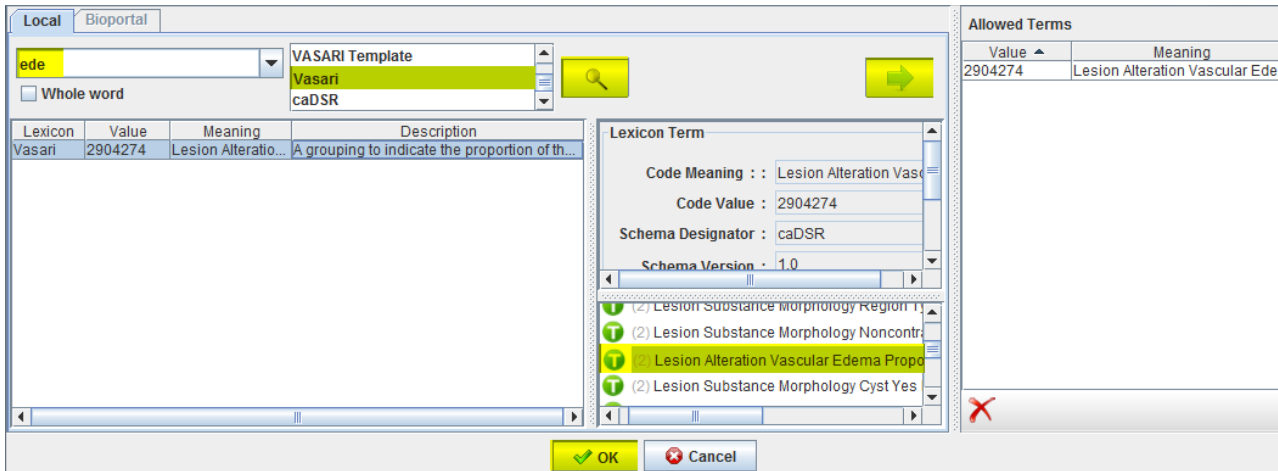
Schema Designator*: caDSR

Schema Version : 1.0

Select Term

AIM Template – Observation characteristic (cont.)

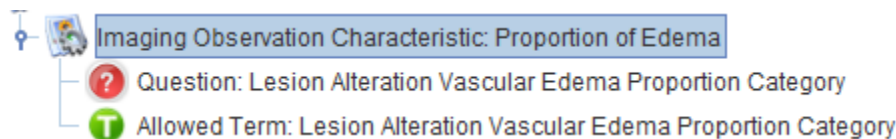
10. Add “Allowed Term” for Imaging Observation Characteristic



Lexicon	Value	Meaning	Description
Vasari	2904274	Lesion Alteratio...	A grouping to indicate the proportion of th...

Code Meaning	Code Value	Schema Designator	Schema Version
Lesion Alteration Vasc...	2904274	caDSR	1.0

Value	Meaning
2904274	Lesion Alteration Vascular Ede...



- Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Lesion Alteration Vascular Edema Proportion Category

AIM Template – Observation characteristic (cont.)

11. Add “Characteristic Quantification” for “Lesion Alteration Vascular Edema Proportion Category”

Template Components

- VASARI_caDSR (ver. 1.0 This is an AIM template example using VASARI information from caDSR)
- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...))
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
 - Question: Where is the location of the tumor?
 - Imaging Observation
 - Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Mass
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)

Description



- Imaging Observation Characteristic: Proportion of Edema
 - Question: Lesion Alteration Vascular Edema Proportion Category
 - Allowed Term: Lesion Alteration Vascular Edema Proportion Category
 - Characteristic Quantification:

Permissible Values

1 - 6 of 6

PV	PV Meaning	PV Meaning Concept Codes	PV Meaning Description	PV Begin Date	PV End Date	VM Public ID	VM Version
> Two Thirds	Greater than Two Thirds		Greater than Two Thirds	2011-08-16		3262723	1.0
Between Two Thirds and One Third	Between Two Thirds and One Third		Between Two Thirds and One Third	2011-08-16		3262722	1.0
Less than One Third	Less than One Third		Less than One Third	2011-08-16		3262721	1.0
Minimal	Minimal		Present in less than five percent of tissue	2011-08-16		3227238	1.0
No Contrast Enhancement	No Contrast Enhancement		No Contrast Enhancement	2011-08-16		3262719	1.0
No Contrast Injected	No Contrast Injected		It appears that contrast was not injected.	2011-08-16		3262720	1.0

Local Bioportal

gre 2 VASARI Template Vasari caDSR 1

Whole word

Value	Meaning	Description
3262723	Greater than two thirds	Greater than Two Thirds

Lexicon Term

Code Meaning : : Greater than two thirds
Code Value : 3262723
Schema Designator : caDSR
Schema Version : 1.0

(1) caDSR
 (1) Greater than two thirds
 (2) Between Two Thirds and One Third
 (2) Less than One Third
 (2) Minimal

5 OK Cancel

12. Add non-quantifiable

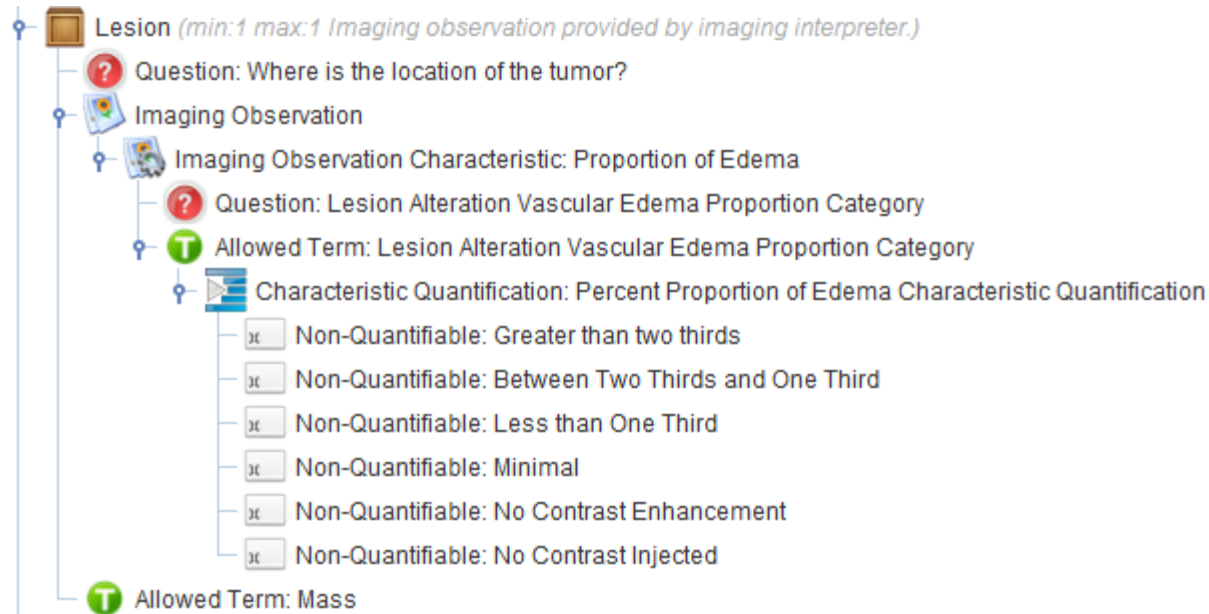


Select Term



AIM Template – Observation characteristic (cont.)

Final result



AIM Template – Inference

1. Add an “Inference” 



Template Components

- VASARI_caDSR (ver:1.0 This is an AIM template example using VASARI information from caDSR.)
- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...))
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)

2. Fill in inference information 

Label*:

Explanatory Text*:

Cardinality*: min to max
 Unlimited

Should Display*:

Authors:

Group Label:

3. Assign Inference 

4. Select

 Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)
 Inference

5. Create a question to associate with the inference 



 Question:
 Inference

Local Bioportal

elo: 2 VASARI Template 1
Whole word VASARI caDSR

Lexicon	Value	Meaning	Description
VASARI...PRI-VASA	Eloquent Brain	Select Eloquent Brain Involvement feature	
	4		

Lexicon Term

Code Meaning : Eloquent Brain
Code Value : PRI-VASARI-7343
Schema Designator : VASARI
Schema Version : 1.0
Description : Select Eloquent Bra
in Involvement feat
ure

- (1) VASARI Template
- (2) Brain Tumor Measurement
- (2) Enhancement Quality
- (2) Eloquent Brain
- (2) Speech Receptive
- (2) Speech Motor

5 OK Cancel

AIM Template – Inference (cont.)

6. Continue to add “Allowed Term”



Eloquent Brain (*min:1 max:1 Select Eloquent Brain Involvement feature*)

Question: Eloquent Brain

Inference



Local Biportal

Vis 2 VASARI Template Vasari caDSR 1

Whole word

Lexicon	Value	Meaning	Description
caDSR	C0042789	Vision 4	The faculty of vision, the perception of objects by the eye.

Lexicon Term

Code Meaning : Vision
Code Value : C0042789
Schema Designator : caDSR
Schema Version : 1.0
Description : The faculty of vision, the perception of objects by the eye.

5

- (2) Mass
- (2) Motor
- (2) New Lexicon Entry
- (2) Vision
- (2) None

6

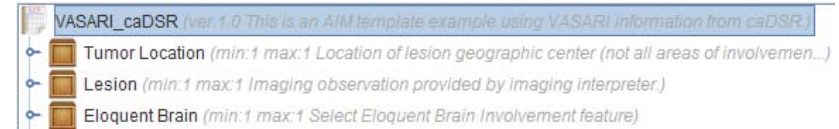
Value	Meaning
86	Speech Motor
87	Speech Receptive
C0042789	Vision
C0549184	None
C1513492	Motor

7

OK Cancel

AIM Template – Markup – Longest Diameter

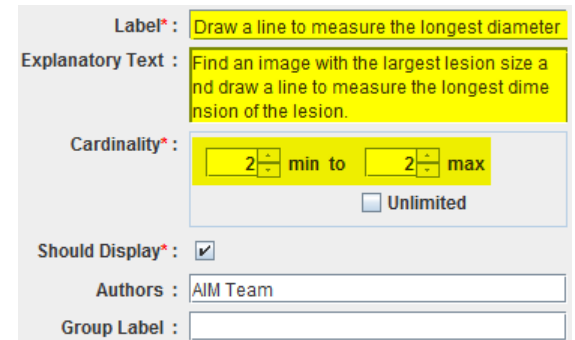
1. Add a “Component”



VASARI_caDSR (ver: 1.0 This is an AIM template example using VASARI information from caDSR)

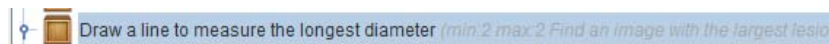
- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)

2. Fill in markup information and “Save”



Label*: Draw a line to measure the longest diameter
Explanatory Text: Find an image with the largest lesion size and draw a line to measure the longest dimension of the lesion.
Cardinality*: 2 min to 2 max
 Unlimited
Should Display*:
Authors: AIM Team
Group Label:

3. Select



Draw a line to measure the longest diameter (min:2 max:2 Find an image with the largest lesion)

4. Add markup



5. Select multi point



Shape Type*: MultiPoint

6. Create a question to associate with the markup



Draw a line for longest diameter (min:2 max:2 Find an image with the largest lesion size)
Question:
Geometric Shape: MultiPoint

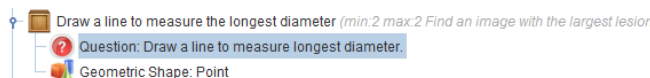


Select Term

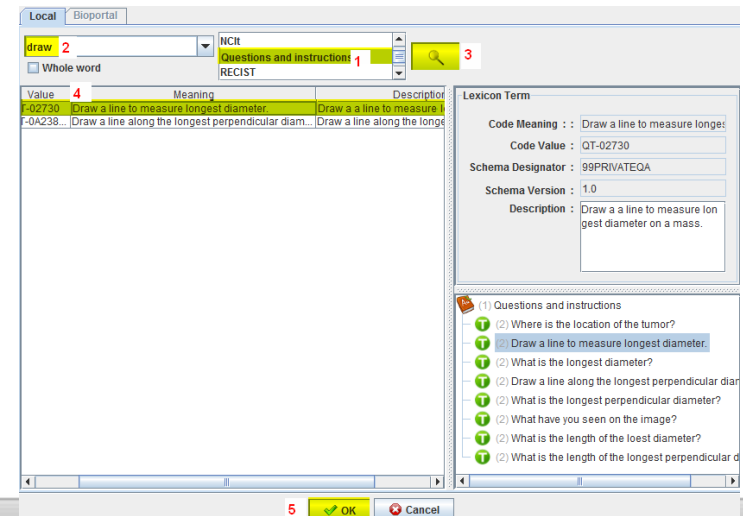


7. Click “Save”

8. Result



Draw a line to measure the longest diameter (min:2 max:2 Find an image with the largest lesion)
Question: Draw a line to measure longest diameter.
Geometric Shape: Point



Local Biportal

draw 2 NCI
Whole word Questions and instructions 1 RECI 3

Value	4	Meaning	Description
-02730	Draw a line to measure longest diameter.	Draw a line to measure l...	
-0A238...	Draw a line along the longest perpendicular diam...	Draw a line along the lon...	

Lexicon Term

Code Meaning : Draw a line to measure longes
Code Value : QT-02730
Schema Designator : 99PRIVATEQA
Schema Version : 1.0
Description : Draw a line to measure longes diameter on a mass.

(1) Questions and instructions

- (2) Where is the location of the tumor?
- (2) Draw a line to measure longest diameter.
- (2) What is the longest diameter?
- (2) Draw a line along the longest perpendicular diam...
- (2) What is the longest perpendicular diameter?
- (2) What have you seen on the image?
- (2) What is the length of the longest diameter?
- (2) What is the length of the longest perpendicular d...

5 OK Cancel

AIM Template – Markup – Longest Perpendicular Diameter

1. Add a “Component”



VASARI_caDSR (ver 1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)
- Draw a line for longest diameter (min:2 max:2 Find an image with the largest lesion size and draw

2. Fill in markup information



Label*: Draw a line to measure a longest perpendicu

Explanatory Text*: Draw a line to measure the longest perpendic ular diameter to the first line.

Cardinality*: 2 min to 2 max
 Unlimited

Should Display*:

Authors: AIM Team

Group Label:

3. Select

Draw longest perpendicular diameter (min:2 max:2 Measure the longest perpendicular diameter

Question: Draw longest perpendicular diameter

4. Add markup



5. Select multi point

Shape Type*: MultiPoint

6. Create a question to associate with the markup



Draw longest perpendicular diameter (min:2 max:2 Measure the longest perpendicular diameter

Question:

Geometric Shape: MultiPoint



Select Term



7. Click “Save”

8. Result



Draw longest perpendicular diameter (min:2 max:2 Measure the longest perpendicular diameter

Question: Draw longest perpendicular diameter

Geometric Shape: MultiPoint

Local Bioportal

Draw 2

Whole word

NCIT Questions and instructions 1

RECIST 3

Lexicon	Value	Meaning	Desc
Quesio	QT-02730	Draw a line to measure longest diameter.	Draw a line to mea
Quesio	QA-0A238	Draw a line along the longest perpendicular.	Draw a line along the

4

Lexicon Term

Code Meaning : Draw a line along the long

Code Value : QA-0A23891

Schema Designator : PRIVATE

Schema Version : 1.0

Description : Draw a line along the longest perpendicular diameter

(1) Questions and instructions

(2) Where is the location of the tumor?

(2) Draw a line to measure longest diameter.

(2) What is the longest diameter?

(2) Draw a line along the longest perpendicular diameter

(2) What is the longest perpendicular diameter?

5 OK Cancel

AIM Template – Label Template for Searching Purposes (Body Part)

1. Add a “Tag”



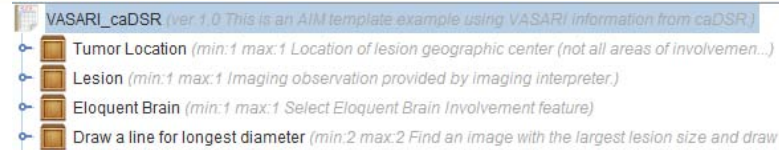
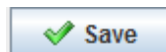
2. Select Term



3. Search for term

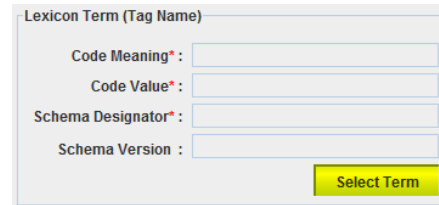


4. Enter “Brain”



VASARI_caDSR (ver: 1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvemem...))
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)
- Draw a line for longest diameter (min:2 max:2 Find an image with the largest lesion size and draw



Lexicon Term (Tag Name)

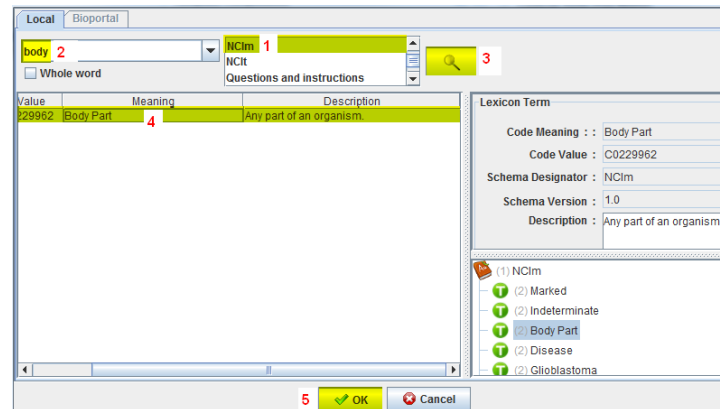
Code Meaning* :

Code Value* :

Schema Designator* :

Schema Version :

Select Term



Local | Biportal

body 2 | NCIIm 1 | NCIit

Whole word | Questions and instructions

Value	Meaning	Description
229962	Body Part	Any part of an organism.

Lexicon Term

Code Meaning : Body Part

Code Value : C0229962

Schema Designator : NCIIm

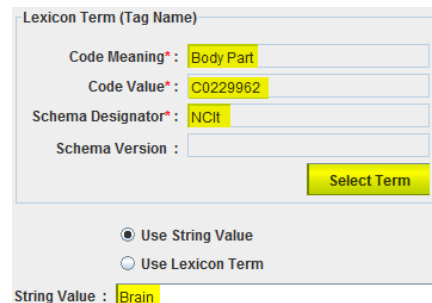
Schema Version : 1.0

Description : Any part of an organism.

(1) NCIIm

- (2) Marked
- (2) Indeterminate
- (2) Body Part
- (2) Disease
- (2) Glioblastoma

5 OK Cancel



Lexicon Term (Tag Name)

Code Meaning* : Body Part

Code Value* : C0229962

Schema Designator* : NCIit

Schema Version :

Select Term

Use String Value

Use Lexicon Term

String Value : Brain

AIM Template – Label Template for Searching Purposes (Disease)

1. Add a “Tag”



2. Select Term



3. Search for term



4. Select Term



VASARI_caDSR (ver: 1.0 This is an AIM template example using VASARI information from caDSR.)

- Tumor Location (min:1 max:1 Location of lesion geographic center (not all areas of involvem...))
- Lesion (min:1 max:1 Imaging observation provided by imaging interpreter.)
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involvement feature)
- Draw a line for longest diameter (min:2 max:2 Find an image with the largest lesion size and draw

Lexicon Term (Tag Name)

Code Meaning* :

Code Value* :

Schema Designator* :

Schema Version :

Select Term

Local Bioportal

dise 2 NCI 1

Whole word NCI

Questions and instructions

Value	Meaning	Description
12634	Disease	Any abnormal condition of the body or min...

Lexicon Term

Code Meaning : Disease

Code Value : C0012634

Schema Designator : NCI

Schema Version : 1.0

Description : Any abnormal condition of the body or mind that

Marked (2)

Indeterminate (2)

Body Part (2)

Disease (2)

5 OK Cancel

Use String Value

Use Lexicon Term 1

String Value :

Lexicon Term (Tag Value)

Code Meaning* :

Code Value* :

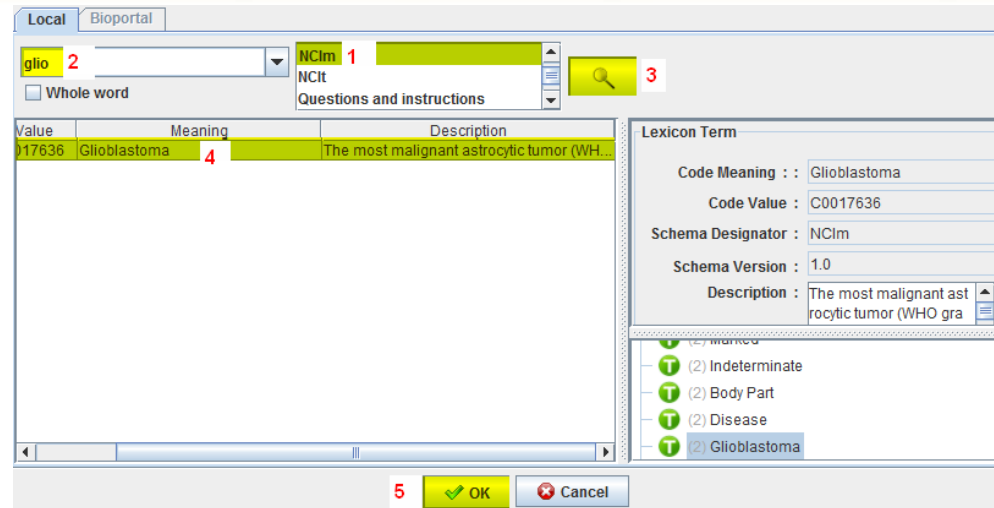
Schema Designator* :

Schema Version :

2 Select Term

AIM Template – Label Template for Searching Purposes (Disease, cont.)

1. Search for term



Local Bioportal

glio 2 NCI 1

Whole word

Value	Meaning	Description
C0017636	Glioblastoma 4	The most malignant astrocytic tumor (WH...

Lexicon Term

Code Meaning : Glioblastoma

Code Value : C0017636

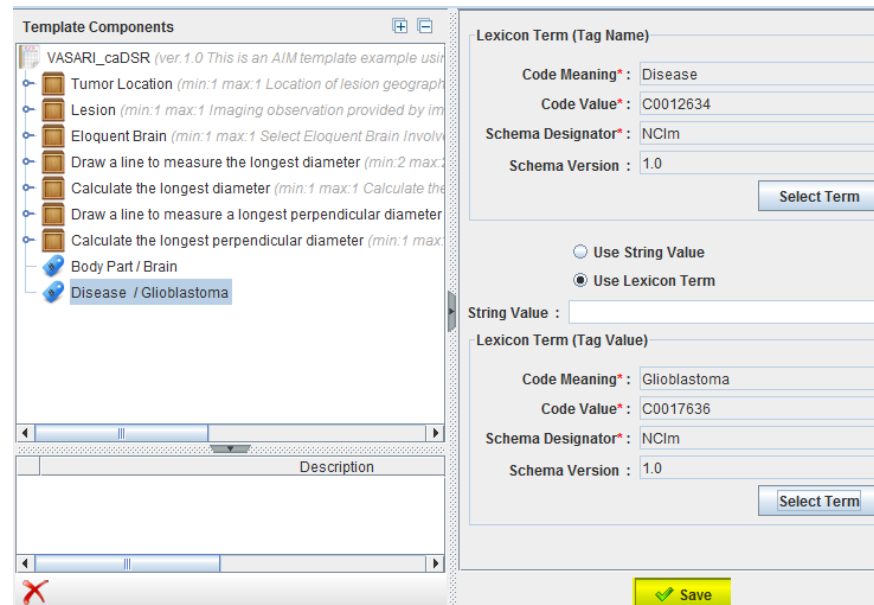
Schema Designator : NCI

Schema Version : 1.0

Description : The most malignant ast...
rocytic tumor (WHO gra

5 OK Cancel

2. Click “Save”



Template Components

- VASARI_caDSR (ver.1.0 This is an AIM template example usin
- Tumor Location (min:1 max:1 Location of lesion geograph
- Lesion (min:1 max:1 Imaging observation provided by im
- Eloquent Brain (min:1 max:1 Select Eloquent Brain Involv
- Draw a line to measure the longest diameter (min:2 max:2
- Calculate the longest diameter (min:1 max:1 Calculate the
- Draw a line to measure a longest perpendicular diameter
- Calculate the longest perpendicular diameter (min:1 max:1
- Body Part / Brain
- Disease / Glioblastoma

Lexicon Term (Tag Name)

Code Meaning* : Disease

Code Value* : C0012634

Schema Designator* : NCI

Schema Version : 1.0

Select Term

Use String Value
Use Lexicon Term

String Value :

Lexicon Term (Tag Value)

Code Meaning* : Glioblastoma

Code Value* : C0017636

Schema Designator* : NCI

Schema Version : 1.0

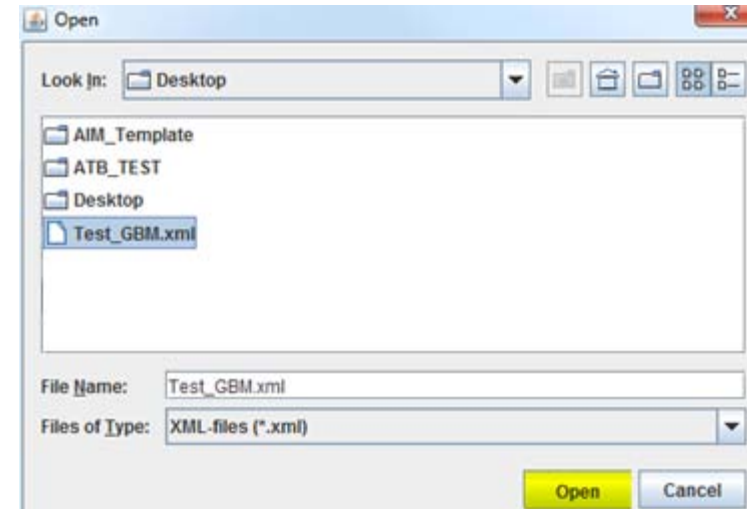
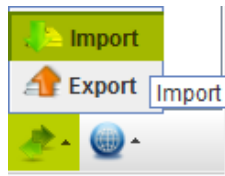
Select Term

Save

ATB Import and Export

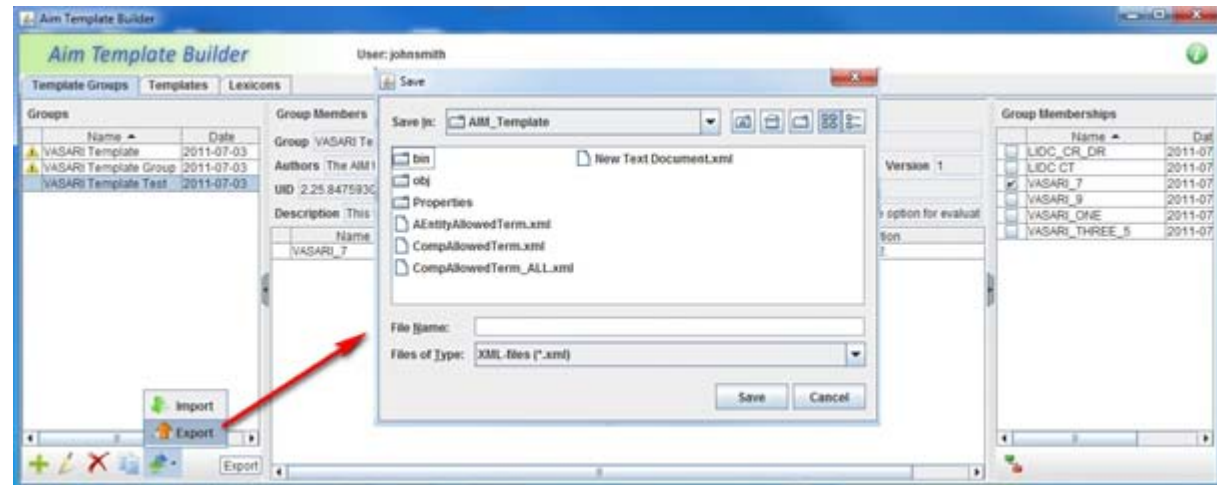
- **Import AIM templates from local computer**

- Select a template group to import



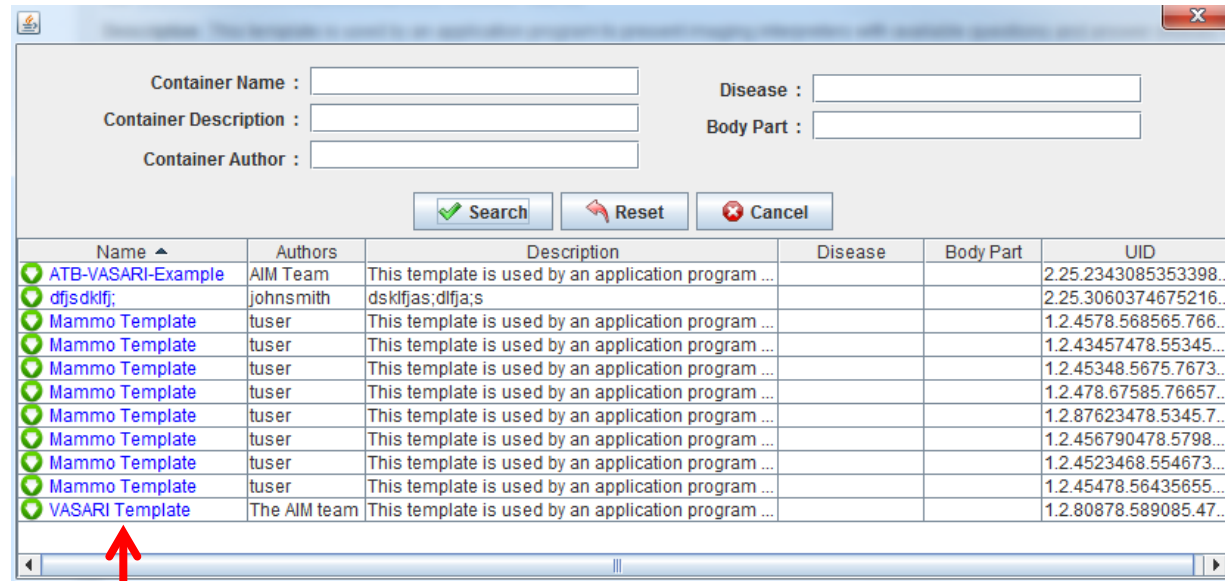
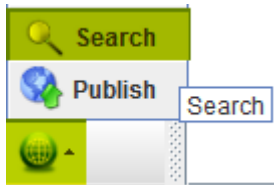
- **Store AIM templates on local computer**

- Select a template group to export
- Export template groups



Working with ATB and ATS – Search

- Search AIM templates from ATS



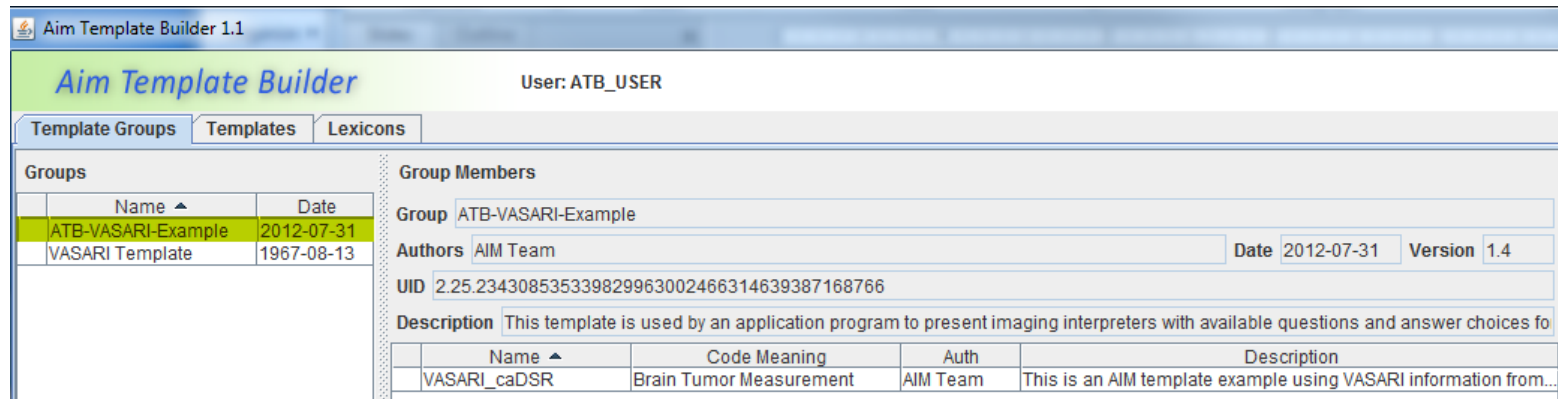
A search results window with a search form at the top and a table of results below. The search form includes fields for Container Name, Container Description, Container Author, Disease, and Body Part, along with Search, Reset, and Cancel buttons. The table lists various templates with columns for Name, Authors, Description, Disease, Body Part, and UID.

Name	Authors	Description	Disease	Body Part	UID
ATB-VASARI-Example	AIM Team	This template is used by an application program ...			2.25.2343085353398...
dfjsdklfj;	johnsmith	dsklfjas;dlfja;s			2.25.3060374675216...
Mammo Template	tuser	This template is used by an application program ...			1.2.4578.568565.766...
Mammo Template	tuser	This template is used by an application program ...			1.2.43457478.55345...
Mammo Template	tuser	This template is used by an application program ...			1.2.45348.5675.7673...
Mammo Template	tuser	This template is used by an application program ...			1.2.478.67585.76657...
Mammo Template	tuser	This template is used by an application program ...			1.2.87623478.5345.7...
Mammo Template	tuser	This template is used by an application program ...			1.2.456790478.5798...
Mammo Template	tuser	This template is used by an application program ...			1.2.4523468.554673...
Mammo Template	tuser	This template is used by an application program ...			1.2.45478.56435655...
VASARI Template	The AIM team	This template is used by an application program ...			1.2.80878.589085.47...


Click to import a template

Working with ATB and ATS – Publish

- Select a template group



The screenshot shows the 'Aim Template Builder' application window. The title bar reads 'Aim Template Builder 1.1'. The main window has a header with 'Aim Template Builder' and 'User: ATB_USER'. Below the header are three tabs: 'Template Groups', 'Templates', and 'Lexicons'. The 'Template Groups' tab is active, showing a table of groups. The 'ATB-VASARI-Example' group is selected and highlighted in yellow. To the right of the table is a 'Group Members' section with fields for 'Group', 'Authors', 'Date', 'Version', and 'UID'. Below these fields is a 'Description' field. At the bottom, there is a table with columns for 'Name', 'Code Meaning', 'Auth', and 'Description'.

Name ^	Date
ATB-VASARI-Example	2012-07-31
VASARI Template	1967-08-13

Group Members

Group: ATB-VASARI-Example

Authors: AIM Team Date: 2012-07-31 Version: 1.4

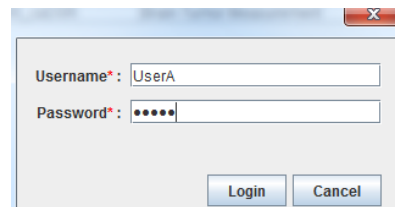
UID: 2.25.234308535339829963002466314639387168766

Description: This template is used by an application program to present imaging interpreters with available questions and answer choices for

Name ^	Code Meaning	Auth	Description
VASARI_caDSR	Brain Tumor Measurement	AIM Team	This is an AIM template example using VASARI information from...

- Publish the selected template to ATS

- Authentication

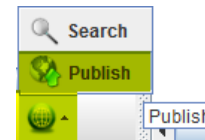


A dialog box for authentication with the following fields and buttons:

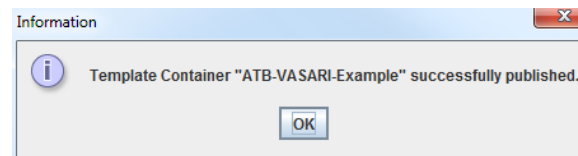
Username*:

Password*:

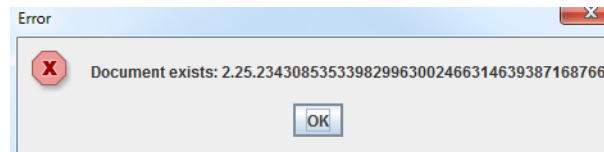
Buttons: Login, Cancel



- Successful submission



- Failed submission



AIM Template Service (ATS)

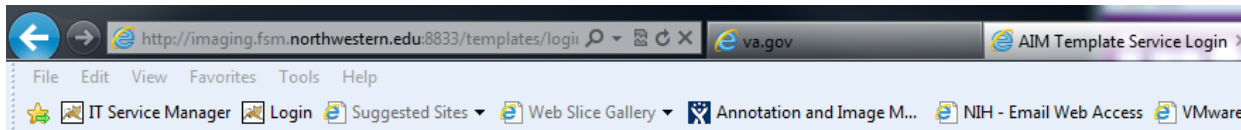
AIM Template Service is an Internet application created for storing, downloading, sharing and searching AIM templates. It has a web browser interface for users to interact with.

ATS will be hosted at <http://imaging.fsm.northwestern.edu>.

ATS – Web Interface – Login

- **Web browser access**

- Use an account



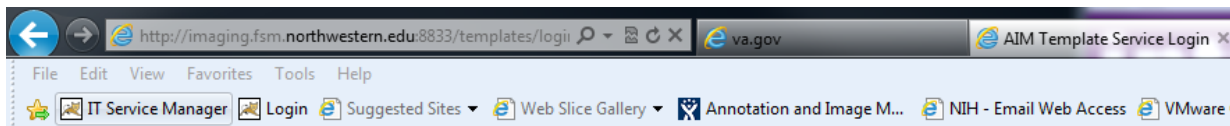
AIM Template Service

Username:

Password:

Login as guest

- Login as Guest



AIM Template Service

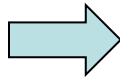
Username:

Password:

Login as guest

ATS – Publish a Template

• **Select a template** →



login name: UserA | [Sign out](#)

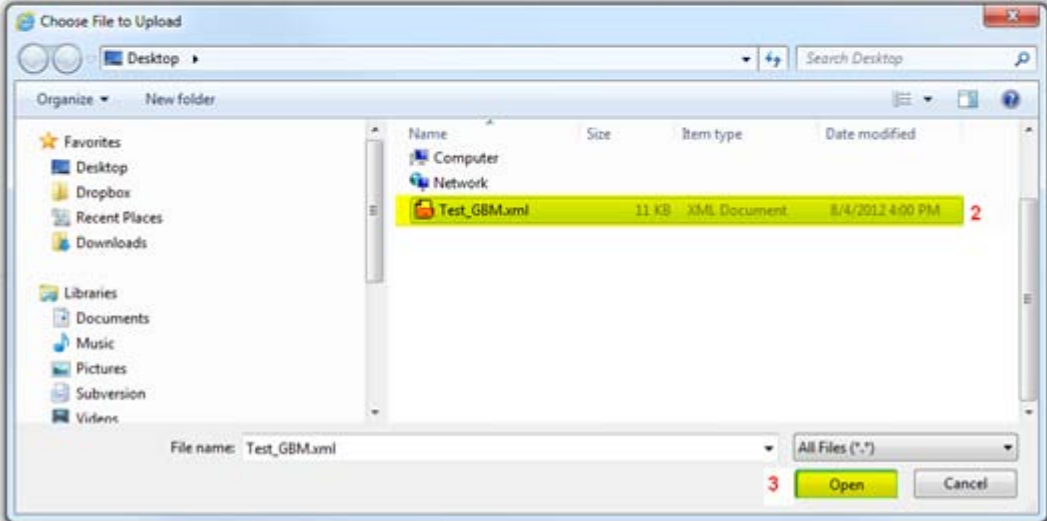
Publish

[Publish](#) [Search Template Groups](#) [Search Template](#) [Administration](#)

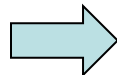
Upload an AIM Template XML file: [Browse...](#)

* ATS supports AIM Template schema version v1.rv23

4 [Submit](#) [Reset](#)



• **Submit a template** →



Upload an AIM Template XML file: [Browse...](#)

* ATS supports AIM Template schema versions v1.rv23

[Submit](#) [Reset](#)

Added to collection ats_test.dbxml. Files added: Test_GBM.xml

Given template document(s) already exist

ATS – Search and Download a Template Group

- Search a template

Template Group Search

Publish Search Template Groups Search Template Administration

Container Name: Disease:
Container Description: Body Part:
Container Author: AIM 1

2 Search Reset

Template Name	Authors	Template Description	Disease	Body Part	Download Template
ATB-VASARI-Example	AIM Team	This template is used by an application program to present imaging interpreters with available questions and answer choices for evaluating brain tumor studies.	Glioblastoma	Brain	download 3

- Download a template

- Browser setting dependence

Template Name	Authors	Template Description	Disease	Body Part	Download Template
ATB-VASARI-Example	AIM Team	This template is used by an application program to present imaging interpreters with available questions and answer choices for evaluating brain tumor studies.	Glioblastoma	Brain	download 1

2
Do you want to open or save Test_GBM.xml (10.9 KB) from imaging.fsm.northwestern.edu? Open Save Cancel x

ATS – Search and Download a Template

- Search a template

Template Search

Publish Search Template Groups Search Template Administration

Template Name:	<input type="text"/>	Disease:	Glioblastoma ¹ <input type="text"/>
Template Code Desc:	<input type="text"/>	Body Part:	<input type="text"/>
Template Description:	<input type="text"/>	Modality:	<input type="text"/>
Template Author:	<input type="text"/>		

² Search Reset

Template Name	Authors	Template Description	Disease	Body Part	Modality	Download Template
VASARI_caDSR	AIM Team	This is an AIM template example using VASARI information from caDSR.	Glioblastoma	Brain	MR	download ³

- Download a template

- Browser setting dependence

Template Name	Authors	Template Description	Disease	Body Part	Modality	Download Template
VASARI_caDSR	AIM Team	This is an AIM template example using VASARI information from caDSR.	Glioblastoma	Brain	MR	download ¹ <input type="text"/>

Do you want to open or save **template_2.25.248576217325677268603117050771746797241.xml** (9.79 KB) from **imaging.fsm.northwestern.edu**? ²

Open Save Cancel

ATS – Administrative Function

Edit Permissions

[Publish](#)
[Search Template Groups](#)
[Search Template](#)
[Administration](#)

Access Permission
Delete

XML

Name	Owner	Publish Date	Permissions	Allowed Users	Change	View
Mammo Template_1.xml	UserA	7/24/12 1:58 PM	public		Change	View
Mammo Template_2.xml	UserA	7/24/12 1:58 PM	public		Change	View
Mammo Template_5.xml	UserA	7/24/12 2:47 PM	public		Change	View
Mammo Template_6.xml	UserA	7/24/12 2:47 PM	public		Change	View
Mammo Template_8.xml	UserA	7/24/12 2:47 PM	public		Change	View
Mammo Template_9.xml	UserA	7/24/12 2:47 PM	public		Change	View
Mammo Template_10.xml	UserA	7/24/12 2:47 PM	public		Change	View
Mammo Template_11.xml	UserA	7/24/12 2:47 PM	public		Change	View
Test_GBM.xml	UserA	8/4/12 4:51 PM	public		Change	View

- Share a template (defaults to “public”)

login name: UserA | Sign out

Change Template Group Mammo Template_1.xml

Permission: Public

Allowed Users:

[Change](#) [Reset](#) [Cancel](#)

[Delete Template](#)

login name: UserA | Sign out

Change Template Group Mammo Template_1.xml

Permission: Private

Allowed Users: UserB, guest2

[Change](#) [Reset](#) [Cancel](#)

[Delete Template](#)

- Delete a template



Feature Requests and Bug Reporting

- **AIM Workstation JIRA**
 - <https://tracker.nci.nih.gov/browse/AIMWS>
- **AIM Template Builder and Service JIRA**
 - <https://tracker.nci.nih.gov/browse/AIMES>
- **HELP ?**
 - FAQ
 - <https://cabig-kc.nci.nih.gov/Imaging/forums/>

Annotation and Image Markup



End User Discussions

This forum hosts questions and discussions related to user experiences with AIM and AIM-related tools.
Moderator: fossettj



Developer Discussions

This forum hosts questions and discussions related to software development with AIM and AIM-related tools.
Moderator: fossettj

Imaging Workstations



End User Discussions

This forum hosts questions and discussions related to user experiences with the ClearCanvas and Osirix workstations.
Moderator: fossettj



Developer Discussions

This forum hosts questions and discussions related to software development related to the ClearCanvas and Osirix workstations.
Moderator: fossettj

AIM Template Builder (ATB)



End User Discussions

This forum hosts questions and discussions related to user experiences with the ATB.
Moderator: fossettj



Developer Discussions

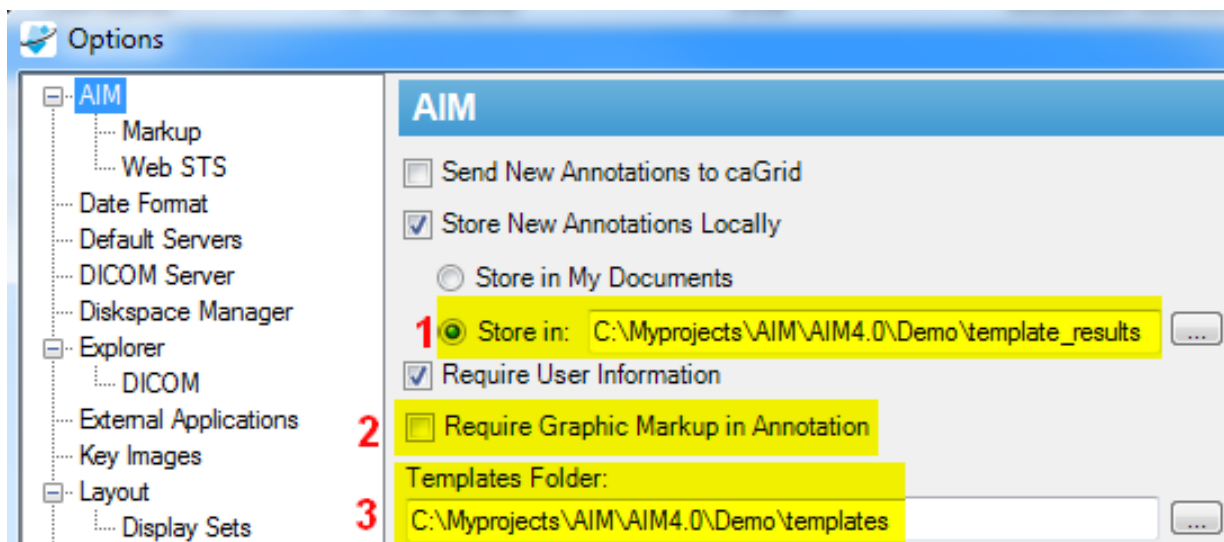
This forum hosts questions and discussions related to software development on the ATB.
Moderator: fossettj

AIM workstation 3.0.x is a reference implementation of AIM 3.0 model on an open source ClearCanvas workstation version 2 SP1. It can import AIM templates created by ATB. It is capable of creating AIM Image Annotation from an AIM template and stores it as AIM XML or AIM DICOM SR documents.

- Software download
 - https://gforge.nci.nih.gov/frs/download.php/9706/AIM_WS_3.0.4.3.rar
- User's manual
 - <https://wiki.nci.nih.gov/display/AIM/AIM+on+ClearCanvas+Workstation+User%27s+Guide>
- Windows XP or above (32-bit mode)
- Existing ClearCanvas workstation needs to be removed
- Install the software as system administrator
- Support AIM version 3.0 model
- Support AIM Template schemas version 1 revisions 18, 19 and 23
 - https://gforge.nci.nih.gov/frs/download.php/9544/AIMTemplate_v1rv23.zip
 - https://gforge.nci.nih.gov/frs/download.php/9551/AIMTemplate_v1rv19.zip
 - https://gforge.nci.nih.gov/frs/download.php/9133/AIMTemplate_v1rv18.rar
- Update AIM Template GUI to support AIM Template schema revision 23
 - Display calculations and geometric shapes (markups)

• Configuration (Tools -> Options)

- #1 stores AIM XML documents in a user-defined location
- #2 requires user to create markups with each annotation
- #3 specifies default folder to search for AIM Templates



AIM on ClearCanvas 3.0.4 (cont.)

Creating AIM

- A. Open a study
- B. Select an image
- C. Create Markup ?
- D. #1 Activate AIM
- E. #2 Import a new template document
- F. #3 Select a template
- G. Fill in the template
- H. #4 Set user info ?
- I. #5 Create AIM annotation document

AIM on ClearCanvas 3.0.4 (cont.)

TCGA-02-0027 [AIM on ClearCanvas Workstation 3.0]

File Edit View Tools Annotation Help

TCGA-02-0027

TCGA-02-0027 F FSE T2
28-Mar-1999
Acq: 09:20:32
Se: 3/14
Im: 15/17
Loc: H34.2

TCGA-02-0027_NU_2012-08-05 22:56 PM 5.18 cm

TCGA-02-0027_NU_2012-08-05 22:56 PM 2.80 cm

320 x 256
ET: 24
TR: 5200.00 ms
TE: 99.00 ms
8HRBRAIN
Thk: 5.0 mm
Zoom: 1.21x
W:3357 L:1678 (Auto)

3.0T
SIGNA EXCITE
DFOV: 24.0 x 24.0 cm

AIM Annotation

AIM Template: Brain Tumor Measurement(PRI-VASARI-1)

Annotation Name: TCGA-02-0027_NU_2012-08-05 22:56 PM

Frontal lobe
Confidence: 1.00

Side of Tumor Center: Right

Where is the location of the tumor?
Lesion Alteration Vascular Edema Proportion Category
Name: Percent Proportion of Edema Characteristic Quantifi
Greater than two thirds

Elloquent Brain: None

Draw a line to measure longest diameter.
MultiPoint Min: 2 Max: 2

What is the longest diameter?

Draw a line along the longest perpendicular diameter
MultiPoint Min: 2 Max: 2

What is the longest perpendicular diameter?

Create Annotation User Info

Questions and Answers

E-mail: aimteam@northwestern.edu

Acknowledgement

- **Justin Kirby and John Freymann (NCI, Cancer Imaging Program)**
 - 26 readers across 3 different multi-site TCGA projects
 - AIM Template contribution (a breast study)
 - Uploaded to ATS
 - Brain and renal study
- **AIM Developers**
 - Vladimir Kleper and Skip Talbot (ATB, ATS, AIM toolkit, AIM Workstation)
 - Alan Snyder (ATB 1.0 and ATS 1.0)