

# **Women's Health: Diagnostic Breast Imaging Documentation Template**

## **Documentation Template: Conceptual Structure**

**Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0005AF**

**Department of Veterans Affairs (VA)**



**Knowledge Based Systems (KBS)  
Office of Informatics and Information Governance (OIIG)  
Clinical Decision Support (CDS)**

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by Knowledge Based Systems (KBS), Office of Informatics and Information Governance (OIIG), and Clinical Decision Support (CDS)

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## Abstract

Diagnostic Breast Imaging

### B3 Group, Inc.

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# Preface

**Table 1. Revision History**

Date	Life Cycle Event
June 18, 2018	Published
May 24, 2018	Published
May 24, 2018	Reviewed
April 19, 2018	Pre-published
April 19, 2018	Created

**Table 2. Clinical White Paper Contributors**

Name	Role	Affiliation
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**Table 3. Artifact Identifier**

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	cf64ef14-25fa-53f4-b32d-a128163e3482	B44

---

# Artifact Applicability

**Table 4. Applicability Foci, Description and Codes**

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Primary Care Provider	SNOMED CT	453231000124104  Primary care provider (occupation)	N/A	N/A
TargetUser	Gynecologist			N/A	N/A
ClinicalVenue	Outpatient	SNOMED CT	33022008   Hospital-based outpatient department (environment)	N/A	N/A
ClinicalFocus	Primary Care, Gynecology, Interventional Radiology, Pathology, Oncology, Surgery			N/A	N/A
PatientGender	Female	SNOMED CT	248152002  Female (finding)	N/A	N/A
PatientAgeGroup	Adult	SNOMED CT	133936004  Adult (person)	N/A	N/A

---

# Models

**Table 5. Model References**

Referenced Model	Description
urn:solor.io:anf-model:1.0	VA Analysis Normal Form Model

---

# Chapter 1. External Data Definitions

## Definitions

**Table 1.1. PatientAge**

Expression: type=elm:SingletonFrom Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value) elm:value[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[105726004  Age AND/OR growth finding (finding)]]
--

**Table 1.2. PatientGender**

Expression: type=elm:SingletonFrom Annotation: Codes: elm:value[elm:Code]: [398166005  Performed (qualifier value) elm:value[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a  Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[248152002  Female (finding)]]
---

**Table 1.3. ScreeningMammogram\_FullReport**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: Codes: elm:element[elm:Code]: [TSR-NoCode]
---

**Table 1.4. ScreeningMammogram\_Images**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: Codes: elm:element[elm:Code]: [24623002  Screening mammography (procedure)]
--

**Table 1.5. ScreeningMammogram\_BIRADSCategory**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: Codes: elm:element[elm:Code]: [[386053000  Evaluation procedure (procedure)]- ->(363702006   Has focus (attribute))->[397137005  Mammography assessment finding (finding)]- ->(363714003   Interprets (attribute))->[96b3834d-b84e-4e41-baf6-87898c70d399  Breast Imaging Reporting and Data System category (observable entity)];]
---

**Table 1.6. ScreeningMammogram\_GeneralBreastComposition**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: Codes: elm:element[elm:Code]: [[386053000  Evaluation procedure (procedure)]- ->(363702006   Has focus (attribute))->[397137005  Mammography assessment finding (finding)]- ->(363714003   Interprets (attribute))->[96b3834d-b84e-4e41-baf6-87898c70d399  Breast Imaging Reporting and Data System category (observable entity)];]
---



**Table 1.7. ScreeningMammogram\_ImportantFindings**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [[24623002 |Screening mammography (procedure)] ->(363702006 |Has focus (attribute))>[129714008 |Mammography finding (finding)]]

**Table 1.8. ScreeningMammogram\_ComparisonToPriorImaging**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.9. ScreeningMammogram\_ManagementRecommendations**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.10. DiagnosticMammogram\_FullReport**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.11. DiagnosticMammogram\_Images**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [71651007 |Mammography (procedure)]

**Table 1.12. DiagnosticMammogram\_BIRADSCategory**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [[386053000 |Evaluation procedure (procedure)]- ->(363702006 |Has focus (attribute))>[397137005 |Mammography assessment finding (finding)]- ->(363714003 |Interprets (attribute))>[96b3834d-b84e-4e41-baf6-87898c70d399 |Breast Imaging Reporting and Data System category (observable entity)];]

**Table 1.13. DiagnosticMammogram\_GeneralBreastComposition**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
 Annotation:  
 Codes: elm:element[elm:Code]: [[71651007 |Mammography (procedure)] ->(363702006 |Has focus (attribute))>[129715009 |Mammographic breast composition finding (finding)]]

**Table 1.14. DiagnosticMammogram\_ImportantFindings**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[71651007 |Mammography (procedure)] ->(363702006 |Has focus (attribute))->[129714008 |Mammography finding (finding)]]

### Table 1.15. DiagnosticMammogram\_ComparisonToPriorImaging

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

### Table 1.16. DiagnosticMammogram\_ManagementRecommendations

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

### Table 1.17. BreastUltrasound\_FullReport

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

### Table 1.18. BreastUltrasound\_Images

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [47079000 |Ultrasonography of breast (procedure)]

### Table 1.19. BreastUltrasound\_BIRADSCategory

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[386053000 |Evaluation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[397137005 |370380004 |Ultrasound scan finding (finding)]- ->(363714003 |Interprets (attribute))->[96b3834d-b84e-4e41-baf6-87898c70d399 |Breast Imaging Reporting and Data System category (observable entity)]]

### Table 1.20. BreastUltrasound\_GeneralBreastComposition

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[47079000 |Ultrasonography of breast (procedure)] ->(363702006 |Has focus (attribute))->[96f9de2e-3f7f-4381-8ce7-27e7575b18d4 |Ultrasonographic breast composition (finding)]]

### Table 1.21. BreastUltrasound\_ImportantFindings

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[47079000 |Ultrasonography of breast (procedure)] ->(363702006 |  
Has focus (attribute))->[397137005 |370380004 |Ultrasound scan finding (finding)]]

**Table 1.22. BreastUltrasound\_ComparisonToPriorImaging**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.23. BreastUltrasound\_ManagementRecommendations**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.24. LastBreastBxReport**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.25. LastBreastBxImages**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [122548005 |Biopsy of breast (procedure)]

**Table 1.26. LastBreastBxType**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.27. LastBreastBxGrossDx**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.28. LastBreastBxMicroscopicDx**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic  
Annotation:  
Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.29. AbnormalImagingResultBiRadsCategory4**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[397144001 |Mammography assessment (Category 4) - Suspicious abnormality, biopsy should be considered (finding)]]

**Table 1.30. AbnormalImagingResultBiRadsCategory5**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[397145000 |Mammography assessment (Category 5) - Highly suggestive of malignancy (finding)]]

**Table 1.31. AbnormalImagingResultWithSymptoms**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[198116001 |Breast signs and symptoms (finding)]]

**Table 1.32. ExamFindingRequiringUrgentEvaluation**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.33. BreastImagingAbnormalResult**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

**Table 1.34. PriorBreastImagingResults**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic

Annotation:

Codes: elm:element[elm:Code]: [TSR-NoCode]

#### Triggers

No trigger definitions are present.

---

# Chapter 2. Expression Definitions

No expression definitions are present.

---

# Chapter 3. Consult Request: Radiology

For review of outside breast imaging study or studies please provide the following information.

# Consult: Radiology  
prompt:  
response: Boolean (Single)  
**responseBinding:** Property ("RadiologyConsult")

#	<b>Condition:</b> elm:Property
	# prompt: Screening mammogram interpretation response: Boolean (Single) <b>responseBinding:</b> Property ("ScreeningMammogram_Interpretation")
	# <b>Condition:</b> elm:Property
	# prompt: Priority-Routine response: Code (Single) <b>initialValue:</b> elm:Code
	# prompt: Full report response: Tuple (Single) <b>initialValue:</b> ScreeningMammogram_FullReport
	# prompt: Images response: Tuple (Single) <b>initialValue:</b> ScreeningMammogram_Images
	# prompt: Date response: Timestamp (Single) <b>initialValue:</b> elm:Property ScreeningMammogram_Images
	# prompt: BI-RADS category response: Code (Single) <b>initialValue:</b> ScreeningMammogram_BIRADSCategory
	# prompt: General breast composition response: String (Single) <b>initialValue:</b> ScreeningMammogram_GeneralBreastComposition
	# prompt: Important findings response: String (Single) <b>initialValue:</b> ScreeningMammogram_ImportantFindings
	# prompt: Comparison to prior imaging response: String (Single) <b>initialValue:</b> ScreeningMammogram_ComparisonToPriorImaging
	# prompt: Management recommendations response: String (Single) <b>initialValue:</b> ScreeningMammogram_ManagementRecommendations

# prompt: Diagnostic mammogram interpretation	
response: Boolean (Single)	
<b>responseBinding:</b> Property ("DiagnosticMammogram_Interpretation")	
# <b>Condition:</b> elm:Property	
# prompt: Priority-Routine	
response: Code (Single)	
<b>initialValue:</b> elm:Code	
# prompt: Full report	
response: Tuple (Single)	
<b>initialValue:</b> DiagnosticMammogram_FullReport	
# prompt: Images	
response: Tuple (Single)	
<b>initialValue:</b> DiagnosticMammogram_Images	
# prompt: Date	
response: Timestamp (Single)	
<b>initialValue:</b> elm:Property DiagnosticMammogram_Images	
# prompt: BI-RADS category	
response: Code (Single)	
<b>initialValue:</b> DiagnosticMammogram_BIRADSCategory	
# prompt: General breast composition	
response: String (Single)	
<b>initialValue:</b> DiagnosticMammogram_GeneralBreastComposition	
# prompt: Important findings	
response: String (Single)	
<b>initialValue:</b> DiagnosticMammogram_ImportantFindings	
# prompt: Comparison to prior imaging	
response: String (Single)	
<b>initialValue:</b> DiagnosticMammogram_ComparisonToPriorImaging	
# prompt: Management recommendations	
response: String (Single)	
<b>initialValue:</b> DiagnosticMammogram_ManagementRecommendations	
# prompt: Breast ultrasound interpretation	
response: Boolean (Single)	
<b>responseBinding:</b> Property ("BreastUltrasound_Interpretation")	
# <b>Condition:</b> elm:Property	
# prompt: Priority-Routine	
response: Code (Single)	
<b>initialValue:</b> elm:Code	
# prompt: Full report	
response: Tuple (Single)	

	<b>initialValue:</b> BreastUltrasound_FullReport # prompt: Images response: Tuple (Single)
	<b>initialValue:</b> BreastUltrasound_Images # prompt: Date response: Timestamp (Single)
	<b>initialValue:</b> elm:Property BreastUltrasound_Images # prompt: BI-RADS category response: Code (Single)
	<b>initialValue:</b> BreastUltrasound_BIRADSCategory # prompt: General breast composition response: String (Single)
	<b>initialValue:</b> BreastUltrasound_GeneralBreastComposition # prompt: Important findings response: String (Single)
	<b>initialValue:</b> BreastUltrasound_ImportantFindings # prompt: Comparison to prior imaging response: String (Single)
	<b>initialValue:</b> BreastUltrasound_ComparisonToPriorImaging # prompt: Management recommendations response: String (Single)
	<b>initialValue:</b> BreastUltrasound_ManagementRecommendations # prompt: Other breast imaging interpretation response: Boolean (Single)
<b>responseBinding:</b>	Property ("OtherBreastImaging_Interpretation")
	# <b>Condition:</b> elm:Property
	# prompt: Priority-Routine response: Code (Single)
	<b>initialValue:</b> elm:Code # prompt: Full report response: Tuple (Single)
	# prompt: Images response: Tuple (Single)
	# prompt: Date response: Timestamp (Single)
	# prompt: BI-RADS category response: Code (Single)
	# prompt: General breast composition response: String (Single)
	# prompt: Important findings



		response: String (Single)
		# prompt: Comparison to prior imaging
		response: String (Single)
		# prompt: Management recommendations
		response: String (Single)

---

# Chapter 4. Consult Request: Pathology

For review of outside specimen(s) please provide the following information.

# Consult: Pathology

prompt:

response: Boolean (Single)

**responseBinding:** Property ("PathologyConsult")

#	<b>Condition:</b> elm:Property	
	# prompt: Breast biopsy interpretation	
	response: Boolean (Single)	
	<b>responseBinding:</b> Property ("BreastBiopsy_Interpretation")	
	#	<b>Condition:</b> elm:Property
		# prompt: Full pathology report: Breast biopsy
		response: Tuple (Single)
		<b>initalValue:</b> LastBreastBxReport
		# prompt: Pathology images: Breast biopsy
		response: Tuple (Single)
		<b>initalValue:</b> LastBreastBxImages
		# prompt: Priority-Routine
		response: Code (Single)
		<b>initalValue:</b> elm:Code
		# prompt: Date
		response: Timestamp (Single)
		# prompt: Biopsy type
		response: Code (Single)
		<b>initalValue:</b> LastBreastBxType
		# prompt: Gross description
		response: String (Single)
		<b>initalValue:</b> LastBreastBxGrossDx
		# prompt: Microscopic description
		response: String (Single)
		<b>initalValue:</b> LastBreastBxMicroscopicDx
		# prompt: Concordant with imaging?
		response: Boolean (Single)
		<b>responseBinding:</b> Property ("ConcordantWithImaging")
	#	<b>Condition:</b> elm:Not (elm:Property("ConcordantWithImaging"))
		# prompt: Details
		response: String (Single)
		# prompt: Additional details

	response: String (Single)
# ❖	Additional Breast Biopsies
	# prompt: Type of biopsy
	response: String (Single)
	# prompt: Location
	response: String (Single)
	# prompt: Date
	response: Timestamp (Single)
	# prompt: Key findings
	response: String (Single)
	# prompt: Concordance with imaging
	response: Boolean (Single)
	# prompt: Additional detail as appropriate
	response: String (Single)

---

# Chapter 5. Consult Request: Evaluation of Abnormal Breast Imaging

<b>Conditions</b>
<b>Condition:</b> elm:AnyTrue

For abnormal imaging result BI-RADS Category 4 or 5, or abnormal result with symptoms or exam finding requiring urgent evaluation.

# Consult specialty  
prompt:  
response: String (Multiple)  
response EnumerationConstraint (List)  
range:  
item: Oncology  
item: Surgery  
item: Interventional Radiology  
**responseBinding:** Property ("ConsultSpecialty")

#	<b>Condition:</b> elm:NotEqual (elm:Property("ConsultSpecialty") elm:Null())
	<p># prompt: Reason for Consult response: String (Single) <b>initialValue:</b> elm:Literal (String) Evaluate for abnormal breast imaging</p> <p># ♦ prompt: Goal of Consult response: String (Single) response range: EnumerationConstraint (List) item: Provide recommendation and return to primary care provider (PCP) for therapy item: Start treatment and return to PCP for follow up and maintenance item: Start treatment, monitor for effect and when on stable therapy return to PCP item: Provide recommendations and treat as long as necessary (or indefinitely)</p> <p># prompt: Priority-Urgent response: Code (Single) <b>initialValue:</b> elm:Code</p> <p># prompt: Date desired response: Timestamp (Single) # prompt: Referring physician response: String (Single) # prompt: Referring physician contact information response: String (Single)</p>

	# prompt: Most recent breast imaging abnormal result
	response: Tuple (Single)
<b>initialValue:</b>	elm:Indexer BreastImagingAbnormalResult elm:Literal()
	# prompt: Prior breast imaging results
	response: Tuple (Single)
<b>initialValue:</b>	PriorBreastImagingResults
	# prompt: Relevant clinical history
	response: String (Single)

---

# Chapter 6. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 6.1. Terminology Versions**

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

**Table 6.2. Terminology References**

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
SNOMED CT	122548005  Biopsy of breast (procedure)	Precoordinated Expression	1
SNOMED CT	133936004  Adult (person)	Adult	1
SNOMED CT	24623002  Screening mammography (procedure)	Precoordinated Expression	1
SNOMED CT	248152002  Female (finding)	Precoordinated Expression	2
SNOMED CT	33022008  Hospital-based outpatient department (environment)	Outpatient	1
SNOMED CT	398166005  Performed (qualifier value)	Precoordinated Expression	2
SNOMED CT	453231000124104  Primary care provider (occupation)	Primary Care Provider	1
SNOMED CT	47079000  Ultrasonography of breast (procedure)	Precoordinated Expression	1
SNOMED CT	71651007  Mammography (procedure)	Precoordinated Expression	1
SNOMED CT	TSR-NoCode <sup>c</sup>	Precoordinated Expression	16
SNOMED CT	[24623002  Screening mammography (procedure)] ->(363702006  Has focus (attribute))->[129714008  Mammography finding (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000  Evaluation procedure (procedure)]->(363702006  Has focus (attribute))->[397137005  370380004  Ultrasound scan finding	Postcoordinated Expression	1

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
	(finding)]- -(363714003  Interprets (attribute))->[96b3834d-b84e-4e41-baf6-87898c70d399  Breast Imaging Reporting and Data System category (observable entity)];		
SNOMED CT	[386053000  Evaluation procedure (procedure)]- -(363702006  Has focus (attribute))->[397137005  Mammography assessment finding (finding)]- -(363714003  Interprets (attribute))->[96b3834d-b84e-4e41-baf6-87898c70d399  Breast Imaging Reporting and Data System category (observable entity)];	Postcoordinated Expression	3
SNOMED CT	[47079000  Ultrasonography of breast (procedure)] -(363702006  Has focus (attribute))->[397137005  370380004  Ultrasound scan finding (finding)]	Postcoordinated Expression	1
SNOMED CT	[47079000  Ultrasonography of breast (procedure)] -(363702006  Has focus (attribute))->[96f9de2e-3f7f-4381-8ce7-27e7575b18d4  Ultrasonographic breast composition (finding)]	Postcoordinated Expression	1
SNOMED CT	[71651007  Mammography (procedure)] -(363702006  Has focus (attribute))->[129714008  Mammography finding (finding)]	Postcoordinated Expression	1
SNOMED CT	[71651007  Mammography (procedure)] -(363702006  Has focus (attribute))->[129715009  Mammographic breast composition finding (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40eb-833a-034c775d034c  Observation procedure (procedure)] -(363702006  Has focus (attribute))->[129715009  Mammographic breast composition finding (finding)]	Postcoordinated Expression	1

System	Code	Display Text <sup>a</sup>	References <sup>b</sup>
	[Has focus (attribute))->[105726004  Age AND/OR growth finding (finding)]		
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c0755026    Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[198116001  Breast signs and symptoms (finding)]	Coordinated Expression	1
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c0755026    Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[248152002  Female (finding)]	Coordinated Expression	1
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c0755026    Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[397144001   Mammography assessment (Category 4) - Suspicious abnormality, biopsy should be considered (finding)]	Coordinated Expression	1
SNOMED CT	[a997cc03-3e99-40eb-833a-0354c0755026    Observation procedure (procedure)] ->(363702006  Has focus (attribute))->[397145000   Mammography assessment (Category 5) - Highly suggestive of malignancy (finding)]	Coordinated Expression	1

<sup>a</sup>If a code is used multiple times in the KNART, only the display text of the first instance is shown.

<sup>b</sup>Count of the number of times the given code system and code pair is used in the KNART.

<sup>c</sup>TSR-NoCode is a placeholder indicating a code was requested, but was not provided.



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# Chapter 7. Behavior Symbols

**Table 7.1. Group Organizational Behavior**

Symbol	Name	Definition
#	Sentence Group	A group of related alternative actions is a sentence group if the item referenced by the action is the same in all the actions, and each action simply constitutes a different variation on how to specify the details for that item. For example, two actions that could be in a SentenceGroup are "aspirin, 500 mg, 2 times per day" and "aspirin, 300 mg, 3 times per day". In both cases, aspirin is the item referenced by the action, and the two actions represent two different options for how aspirin might be ordered for the patient. Note that a SentenceGroup would almost always have an associated selection behavior of "AtMostOne", unless it's a required action, in which case, it would be "ExactlyOne".
#	Logical Group	A group with this behavior logically groups its sub-elements, and may be shown as a visual group to the end user, but it is not required to do so.
►	Visual Group	Any group marked with this behavior should be displayed as a visual group to the end user.

**Table 7.2. Group Selection Behavior**

Symbol	Name	Definition
#	Any	Any number of the items in the group may be chosen, from zero to all.
#	All	All the items in the group must be selected as a single unit.
#	AllOrNone	All the items in the group are meant to be chosen as a single unit: either all must be selected by the end user, or none may be selected.
#	ExactlyOne	The end user must choose one and only one of the selectable items in the group. The user may not choose none of the items in the group.
★	AtMostOne	The end user may choose zero or at most one of the items in the group.
✱	OneOrMore	The end user must choose a minimum of one, and as many additional as desired.

**Table 7.3. Required Behavior**

Symbol	Name	Definition
◆	Must	An action with this behavior must be included in the actions processed by the end user; the end user may not choose not to include this action.
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.

Symbol	Name	Definition
➤	MustUnlessDocumented	An action with this behavior must be included in the set of actions processed by the end user, unless the end user provides documentation as to why the action was not included.

**Table 7.4. Precheck Behavior**

Symbol	Name	Definition
▲	Yes	An action with this behavior is one of the most frequent actions that is, or should be, included by an end user, for the particular context in which the action occurs. The system displaying the action to the end user should consider "pre-checking" such an action as a convenience for the user.
#	No	An action with this behavior is one of the less frequent actions included by the end user, for the particular context in which the action occurs. The system displaying the actions to the end user would typically not "pre-check" such an action.

**Table 7.5. Cardinality Behavior**

Symbol	Name	Definition
◆	Single	An action with this behavior may only be completed once.
❖	Multiple	An action with this behavior may be repeated multiple times.

**Table 7.6. Item Flags**

Symbol	Name	Definition
☞	fillIn	This item, in a list entry, allows the user to enter a fill in value that is not present in the set of presented choices.

**Table 7.7. Read Only Behavior**

Symbol	Name	Definition
#	true	For a particular action or action group, specifies whether the elements are read only.

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# Appendix A. References

This appendix contains the list of related resources and supporting documents used in creating this KNART.

## List of References

## Related Resources

[CCWP] *Women's Health: Diagnostic Breast Imaging Clinical Content White Paper*

[CSD] *Women's Health: Diagnostic Breast Imaging Documentation Template Conceptual Structure Document*

[KVRpt] *Women's Health: Diagnostic Breast Imaging Documentation Template KNART Validation Report*

## Supporting Evidence

[ACS 2017] *American Cancer Society. Lifetime Probability of Developing and Dying from Cancer, 2011-2013. American Cancer Society, Surveillance Research, 2017. Cancer Facts & Figures 2017 website.* (link [<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2017/lifetime-probability-of-developing-and-dying-from-cancer-2011-2013.pdf>])

[ACR 2013] *American College of Radiology, Quality and Safety Resources – Breast Imaging - Reporting and Data Systems (BI-RADS) Atlas. 5th edition. 2013.* (link [<https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Bi-Rads>])

[ACR 5TIER] *Radiopedia - 5-tier American College of Radiology (ACR) system of radiologic breast findings.* (link [<https://radiopaedia.org/articles/5-tier-acr-system-of-radiologic-breast-findings>])

[BIRADS FINAL] *Radiology Assistant - BI-RADS Final Assessment.* (link [<http://www.radiologyassistant.nl/en/p53b4082c92130/bi-rads-for-mammography-and-ultrasound-2013.html#in53b4389d91374>])

[BIRADS Mammography] *American College of Radiology. ACR BI-RADS Atlas 5th Edition – Mammography: Reporting System. American College of Radiology website.* (link [<https://www.acr.org/-/media/ACR/Files/RADS/BI-RADS/Mammography-Reporting.pdf>])

[BIRADS Ultrasound] *American College of Radiology. ACR BI-RADS Atlas 5th Edition – Ultrasound: Reporting System. American College of Radiology website.* (link [<https://www.acr.org/-/media/ACR/Files/RADS/BI-RADS/US-Reporting.pdf>])

[NCCN 2017] *National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Breast Cancer Screening and Diagnosis, Version 1.2017. National Comprehensive Cancer Network Guidelines website.* (link [[https://www.nccn.org/professionals/physician\\_gls/pdf/breast-screening.pdf](https://www.nccn.org/professionals/physician_gls/pdf/breast-screening.pdf)])

[Oeffinger 2015] *KC Oeffinger, ETH Fontham, R Etzioni, and et al. Breast Cancer Screening for Women at Average Risk: 2015 Guideline Update from the American Cancer Society. JAMA. 2015;314(15):1599-1614* (link [<https://doi.org/10.1001/jama.2015.12783>])