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, CLIN0009CA**

Department of Veterans Affairs (VA)

Women's Health: Diagnostic Breast Imaging Documentation Template: Documentation Template: Conceptual Structure

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

B3 Group, Inc.

Cognitive Medical Systems, Inc.

Table of Contents

List of Tables

Preface

Table 1. Revision History

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

Table 2. Clinical White Paper Contributors

Name	Role	Affiliation
C. Yvette Williams-Harris, MD MPH	Author	Physician, 1670 Clairmont Rd Atlanta, GA 30033
Megan Gerber, MD MPH	Author	Physician, VA Boston HealthCare System, 150 South Huntington Ave Boston, MA 02130
Caitlin M. Cusack, MD MPH	Author	Contractor - Physician Informaticist, Office of Women's Health Services, 8455 Colesville Rd, 12th Floor Silver Spring, MD 20910

Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	3798c95b-e881-5871-b6b9-39f4e29ce40b	O32

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. LastScreeningMammogram

Expression: type=elm:Query
Annotation:
Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)|]elm:value[elm:Code]: [24623002 |Screening mammography (procedure)|]

Table 1.2. SurgicalHistory

Expression: type=elm:Query
Annotation:
Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)|]elm:value[elm:Code]: [TSR-NoCode]

Table 1.3. CurrentMedications

Expression: type=elm:Query
Annotation:
Codes: elm:value[elm:Code]: [398166005 |Performed (qualifier value)|]elm:value[elm:Code]: [TSR-NoCode]

Triggers

No trigger definitions are present.

Chapter 2. Expression Definitions

Table 2.1. PatientAge

Expression: type=elm:Query

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 2.2. PatientGenderFemale

Expression: type=elm:SingletonFrom

Annotation:

Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[248152002 |Female (finding)]]

Chapter 3. Reason for Visit

prompt: Patient age in years
response: Integer (Single)
initalValue: PatientAge
prompt: Reason for visit
response: String (Single)

Chapter 4. Breast Imaging History

Condition: elm:Exists (LastScreeningMammogram)	
Most Recent Screening Mammography Results	
# prompt: Date	
response: Timestamp (Single)	
initalValue: elm:Property LastScreeningMammogram	
# prompt: BI-RADS Category	
response: Code (Single)	
# prompt: General breast composition	
response: String (Single)	
# prompt: Important findings	
response: String (Single)	
# prompt: Mammography comparison to prior imaging	
response: String (Single)	
# prompt: Management recommendations	
response: String (Single)	
# prompt: Patient or Proxy notification completed?	
response: Boolean (Single)	
responseBinding: Property ("NotificationCompleted")	

#	**Condition:** elm:Property
	Notification Documentation
	# prompt: Date
	response: Timestamp (Single)
	# prompt: Method
	response: String (Single)
	# prompt: Notification recipient
	response: String (Single)

# prompt: Prior Breast Imaging?	
Enable recording of multiple prior imaging results	
response: Boolean (Single)	
responseBinding: Property ("PriorBreastImaging")	

#	**Condition:** elm:Property
	# prompt: Is a written report available?
	response: Boolean (Single)
	responseBinding: Property ("WrittenReportAvailable")

#	**Condition:** elm:Property
	# prompt: Please send a copy of the report to the radiology department to record result in electronic health record and to document result

response: Boolean (Single)

prompt: Result of written report

response: String (Single)

response range: EnumerationConstraint (List)

    item: Normal image (no evidence of malignancy)(17621005 |Normal (qualifier value)|)

    item: Abnormal image(263654008 |Abnormal (qualifier value)|)

    item: Incomplete image needing additional image

    # ❖ Additional Details

      # prompt: BI-RADS Categories

      response: String (Single)

      # prompt: Date

      response: Timestamp (Single)

      # prompt: Location

      response: String (Single)

      # prompt: Result

      response: String (Single)

Chapter 5. Focused History

#	Patient Breast Symptoms

	# prompt:	Distinct breast mass
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[89164003 |Breast lump (finding)]
	response:	Boolean (Single)

responseBinding: Property ("DistinctBreastMass")

#	**Condition:**elm:Property

	# prompt:	Location
	response:	String (Single)
	# prompt:	Details
	response:	String (Single)

	# prompt:	Indistinct breast tissue thickening
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[7c92d261-2f82-4a07-a9bb-b88fa7fa6ddf	Thickening of tissue of breast (finding)]
	response:	Boolean (Single)

responseBinding: Property ("IndistinctFindingThickening")

	# prompt:	Indistinct breast tissue nodularity
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[67b3628a-559f-4f45-9d84-e5dbb14b5298	Nodularity of tissue of breast (finding)]
	response:	Boolean (Single)

responseBinding: Property ("IndistinctFindingNodularity")

#	**Condition:**elm:Or (elm:Property("IndistinctFindingThickening" from: elm:ParameterRef(Responses)) elm:Property("IndistinctFindingNodularity" from: elm:ParameterRef(Responses)))

	# prompt:	Location
	response:	String (Single)
	# prompt:	Details
	response:	String (Single)

	# prompt:	Nipple discharge
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[54302000 |Discharge from nipple (disorder)]
	response:	Boolean (Single)

responseBinding: Property ("NippleDischarge")

#	**Condition:**elm:Property

	# prompt:	Type of discharge
	response:	String (Single)
	response range:	EnumerationConstraint (List)

item: Normal lactation([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[54302000 |Discharge from nipple (disorder)]- ->(42752001 |Due to (attribute))->[82374005 |Lactation normal (finding)];)

item: Nonspontaneous([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[cbf03791-769c-403d-aac6-f6581bd103c8 |Non-spontaneous discharge from nipple (disorder)])

item: Suspicious([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[c76068c5-002d-4442-8795-5ce6662261f8 |Suspicious discharge from nipple (disorder)])

prompt: Details

response: String (Single)

prompt: Skin Changes

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[115951000119105 |Breast symptom of change in skin (finding)]

response: Boolean (Single)

responseBinding: Property ("SkinChanges")

| **Condition:**elm:Property

prompt: Location

response: String (Single)

prompt: Details

response: String (Single)

prompt: Breast Pain

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[53430007 |Pain of breast (finding)]

response: Boolean (Single)

responseBinding: Property ("BreastPain")

| **Condition:**elm:Property

prompt: Cyclic

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[237453001 | Cyclical mastalgia (finding)]

response: Boolean (Single)

prompt: Focal

itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[11779c10-f86f-44d6-b7f7-38adcbf128e7 | Focal pain of breast (finding)]

response: Boolean (Single)

responseBinding: Property ("FocalBreastPain")

| **Condition:**elm:Property

prompt: Location

			response: String (Single)
			# prompt: Details
			response: String (Single)

prompt: Other breast symptoms

response: Boolean (Single)

responseBinding: Property ("OtherBreastSymptoms")

#	**Condition:**elm:Property
	# prompt: Details
	response: String (Single)

prompt: No breast symptoms

response: Boolean (Single)

| Breast Cancer Risk Factors

prompt: Risk Factors

response: String (Multiple)

response range: EnumerationConstraint (List)

item: Dense breast tissue([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[d4398d10-bdb2-4353-8dd5-63baa97ef026 |Breast tissue dense (finding)])

item: Radiation therapy to chest before age of 30 years(711299007 |Radiotherapy to thorax (procedure)|)

item: BRCA mutation carrier([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[445333001 |Breast cancer genetic marker of susceptibility positive (finding)])

item: First degree relative is a BRCA mutation carrier([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[445333001 |Breast cancer genetic marker of susceptibility positive (finding)])

item: Prior proliferative breast disease on biopsy(TSR-NoCode)

item: Personal history of breast cancer([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[254837009 | Malignant neoplasm of breast (disorder)])

item: Family history of breast cancer([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[254837009 |Malignant neoplasm of breast (disorder)])

item: Significant family history of other cancers(TSR-NoCode)

☞ item: Other

prompt: Other Details

response: String (Single)

| Overall Breast Cancer Risk

prompt: Details of overall breast cancer risk

response: String (Single)

prompt: National Cancer Institute's Breast Cancer Risk Assessment Tool

response: URL (Single)

initalValue: elm:Literal (String) https://www.cancer.gov/bcrisktool/

\# Breast Implants

> \# prompt: Has breast implants
>
> itemCode: [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[449844005 |Breast prosthesis in situ (finding)]
>
> response: Boolean (Single)

responseBinding: Property ("BreastImplants")

> > \# **Condition:**elm:Property
> >
> > > \# prompt: Details
> > >
> > > response: String (Single)

\# Other Breast Surgeries or Biopsies

> \# prompt: Prior Breast Surgeries Not Addressed Above
>
> itemCode: 392090004 |Operation on breast (procedure)|
>
> response: Boolean (Single)

responseBinding: Property ("OtherSurgeries")

> \# prompt: Prior Biopsies Not Addressed Above
>
> itemCode: 122548005 |Biopsy of breast (procedure)|
>
> response: Boolean (Single)

responseBinding: Property ("OtherBiopsies")

> > \# ❖ **Condition:**elm:Or (elm:Property("OtherSurgeries" from: elm:ParameterRef(Responses)) elm:Property("OtherBiopsies" from: elm:ParameterRef(Responses)))
> >
> > > \# prompt: Procedure
> > >
> > > response: String (Single)
> > >
> > > \# prompt: Date
> > >
> > > response: Timestamp (Single)

\# Current Therapy for Breast Conditions

> \# prompt: Current Therapy for Breast Conditions
>
> response: Boolean (Single)

responseBinding: Property ("CurrentTherapy")

> > \# ❖ **Condition:**elm:Property
> >
> > > \# prompt: Diagnosis of breast condition
> > >
> > > response: String (Single)
> > >
> > > \# prompt: Current therapy for breast condition description(s)
> > >
> > > response: String (Single)
> > >
> > > \# prompt: Details
> > >
> > > response: String (Single)

\# Reproductive Status

> \# prompt: Reproductive Status
>
> response: String (Single)

	response range:	EnumerationConstraint (List)
	item:	Postmenopausal([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[76498008 |Postmenopausal state (finding)])
	item:	Pregnant([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[77386006 |Pregnant (finding)])
	item:	Premenopausal, Not pregnant(TSR-NoCode)

Contraceptive Status

	# ◆ prompt:	Contraceptive Status
	response:	String (Single)
	response range:	EnumerationConstraint (List)
	item:	Not applicable
	item:	Tubal ligation(77543007 |Ligation of fallopian tube (procedure)|)
	item:	Permanent implanted birth control([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[00baab-ba-6174-4ba0-81ac-fbf9ffe0bd28 |Permanent implanted contraception (finding)])
	item:	Using contraceptives([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[762650003 |Uses contraception (finding)])
	item:	Attempting to conceive([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[169449001 |Trying to conceive (finding)])
	item:	Not attempting to conceive([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[169449001 |Trying to conceive (finding)])
	item:	Not using contraception([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[762650003 |Uses contraception (finding)])

responseBinding: Property ("ContraceptiveStatus")

	#	**Condition:**elm:Or (elm:Equal(elm:Property("ContraceptiveStatus" from: elm:ParameterRef(Responses)) elm:Literal()) elm:Equal(elm:Property("ContraceptiveStatus" from: elm:ParameterRef(Responses)) elm:Literal()))
	# ◆ prompt:	Details
	response:	String (Single)

Chapter 6. Problem List

prompt: Problem List
 response: String (Single)
prompt: Relevant comorbidities to breast cancer risk
 response: String (Single)

Chapter 7. Surgical History

prompt: Relevant Surgical History Not Addressed Above

response: Tuple (Single)

initalValue: SurgicalHistory

Chapter 8. Medication List

prompt: Current Medication List

response: Tuple (Single)

initalValue: CurrentMedications

Chapter 9. Clinical Breast Exam

Include Location and Distance from Nipple for Positive Findings

\# prompt: Appearance
response: String (Single)

\# prompt: Findings on breast palpation
response: String (Single)

\# prompt: Lymph node findings
response: String (Single)

\# prompt: Other findings
response: String (Single)

Chapter 10. Patient/Proxy Discussion

# prompt:	Imaging results reviewed, and next steps/plan of care discussed with:
re-sponse:	String (Single)
re-sponse range:	EnumerationConstraint (List)
item:	Patient(116154003 |Patient (person)|)
item:	Proxy(451171000124107 |Appointed healthcare surrogate (person)|)
responseBinding:	Property ("DiscussionTarget")
# **Condition:**	elm:Equal (elm:Property("DiscussionTarget" from: elm:ParameterRef(Responses)) elm:Literal())

Proxy Information

# prompt:	Relationship
response:	String (Single)
response range:	EnumerationConstraint (List)
item:	Spouse(127848009 |Spouse (person)|)
item:	Significant other(262043009 |Partner in relationship (person)|)
item:	Medical power of attorney(57a30df3-8aea-4038-a55b-c1a245666f4e |Medical power of attorney (record artifact)|)
☞ item:	Other
# prompt:	Other Details
response:	String (Single)
# prompt:	Legal status, if applicable
response:	String (Single)
# prompt:	Details
response:	String (Single)

# prompt:	Potential need for extended follow-up addressed?
	Patient aware of need for extended follow-up?
re-sponse:	Boolean (Single)
responseBinding:	Property ("ExtendedFollowupAddressed")
# **Condition:**	elm:Property

# prompt:	Is patient likely to be available for extended follow up?
response:	Boolean (Single)
responseBinding:	Property ("PatientAvailable")
# **Condition:**	elm:IsFalse (elm:Property("PatientAvailable" from: elm:Parameter-Ref(Responses)))
# prompt:	Details

| | response: String (Single) |

Patient/Proxy Preferences Discussed?

prompt:

re- Boolean (Single)
sponse:

responseBinding: Property ("PreferencesDiscussed")

Condition: elm:Property

prompt: Patient Preferences:

response: String (Single)

response range: EnumerationConstraint (List)

item: Active pursuit of diagnosis(TSR-NoCode)

item: Monitoring only(182777000 |Monitoring of patient (regime/therapy)|)

item: Aggressive treatment(133877004 | Therapeutic regimen (regime/therapy))

item: Palliation only(103735009 |Palliative care (regime/therapy)|)

☞ item: Other

prompt: Other Details

response: String (Single)

Patient Contact Preference

prompt:

re- String (Multiple)
sponse:

re- EnumerationConstraint (List)
sponse
range:

item: Phone call

item: In person

item: Non-registered letter

item: Secure messaging

☞ Other
item:

Other Details
prompt:

re- String (Single)
sponse:

Chapter 11. Plan of Care

Continue Standard Screening Mammography

prompt:

Recommended for BI-RADS Category 1 or 2 Screening Mammography result.

re-
sponse: Boolean (Single)

responseBinding: Property ("ContinueStandardScreeningMammography")

Condition: elm:Property

> # prompt: Date next mammogram due
>
> response: Timestamp (Single)

Diagnostic Mammography in 6 months from today

prompt:

Recommended for evaluation of BI-RADS Category 3 Screening Mammography result.

re-
sponse: Boolean (Single)

responseBinding: Property ("DiagnosticMammography6")

Condition: elm:Property

> # prompt: Date next mammogram due
>
> response: Timestamp (Single)

initalValue: elm:AddDefault value is today + 6 months. elm:Today() elm:Quantity(6 months)

Diagnostic Mammography Now

prompt:

Recommended for Patients Age 30 Years or Older with a Breast Mass, Asymmetric Thickening or Nodularity, Persistent Focal Breast Pain, Skin Changes, or Suspicious Nipple Discharge; an Option for Patients Younger than Age 30 Years with Asymmetric Thickening or Nodularity, Skin Changes, or Suspicious Nipple Discharge.

re-
sponse: Boolean (Single)

responseBinding: Property ("DiagnosticMammographyNow")

Condition: elm:Property

> # prompt: Details
>
> response: String (Single)

Breast Ultrasound Imaging Now

prompt:

Recommended for Patients Younger Than Age 30 Years with a Breast Mass, Asymmetric Thickening or Nodularity, Persistent Focal Breast Pain, Skin Changes, or Suspicious Nipple Discharge; Recommended in Conjunction with Diagnostic Mammography for Patients Age 30 Years or Older with Asymmetric Thickening or Nodularity, Skin Changes, or Suspicious Nipple Discharge; an Option in Conjunction with Diagnostic Mammography for Patients Age 30 Years or Older with Persistent Focal Breast Pain; an Option as the Initial Diagnostic Evaluation for Patients Age 30 to 39 Years Old with a Suspected Cyst or a Breast Mass or Asymmetric Thickening or Nodularity Where the Clinical Suspicion is Low.

re- Boolean (Single)

sponse:

responseBinding: Property ("BreastUltrasoundImagingNow")

| **Condition:** elm:Property

> # prompt: Details
>
> response: String (Single)

Referral for Breast Biopsy Now

prompt:

Recommended for Evaluation of BI-RADS Category 4 or 5 Screening Mammography Result; Recommended for Evaluation of BI-RADS Category 3 Screening Mammography Result in Patients Unlikely to Return for Follow-Up; an Option for Evaluation of BI-RADS Category 3 Screening Mammography Result in Patients with a Strong Preference for More Immediate Evaluation.

re- Boolean (Single)

sponse:

responseBinding: Property ("BreastBxReferralNow")

| **Condition:** elm:Property

> # prompt: Details
>
> response: String (Single)

Reassurance and Patient Education with or without Symptomatic Therapy

prompt:

Recommended for Patients with Cyclic, Diffuse Pain, Whose Clinical Breast Exams Are Otherwise Normal and Whose Mammograms Are Up-to-Date and Normal.

re- Boolean (Single)

sponse:

responseBinding: Property ("ReassuranceEducation")

| **Condition:** elm:Property

> # prompt: Details
>
> response: String (Single)

Observation and Patient Education

prompt:

Recommended for Patients with Bilateral or Multiple-Duct Nonspontaneous Nipple Discharge Whose Clinical Breast Exams Are Otherwise Normal and Whose Screening Mammograms, If Recommended, Are Up-to-Date and Normal.

re- Boolean (Single)

sponse:

Observation and Patient Education

prompt:

Recommended for Patients Younger Than Age 30 Years with a Palpable Breast Mass or Asymmetric Thickening or Nodularity Where the Clinical Suspicion Is Low.

re- Boolean (Single)

sponse:

Evaluate Medications for Potential Causes of Galactorrhea

prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("EvaluateMeds")

#	**Condition:**elm:Property
	# prompt: Details
	response: String (Single)

Obtain Prior External Breast Imaging Results and/or Films

prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("ObtainPrior")

#	**Condition:**elm:Property
	# prompt: Details
	response: String (Single)

Plan Reviewed with and Agreed to by Patient/Proxy

prompt:

re- Boolean (Single)

sponse:

Other

prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("OtherPlan")

#	**Condition:**elm:Property
	# prompt: Details
	response: String (Single)

Chapter 12. Tabular List

Terminology Service Request (TSR) Mappings

Table 12.1. Terminology Versions

Name	Identifer	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

Table 12.2. Terminology References

System	Code	Display Text[a]	References[b]
SNOMED CT	103735009 |Palliative care (regime/therapy)|	Palliation only	1
SNOMED CT	116154003 |Patient (person)|	Patient	1
SNOMED CT	122548005 |Biopsy of breast (procedure)|	Precoordinated Expression	1
SNOMED CT	127848009 |Spouse (person)|	Spouse	1
SNOMED CT	133877004	Therapeutic regimen (regime/therapy)	Aggressive treatment	1
SNOMED CT	133936004 |Adult (person)|	Adult	1
SNOMED CT	17621005 |Normal (qualifier value)|	Normal image (no evidence of malignancy)	1
SNOMED CT	182777000 |Monitoring of patient (regime/therapy)|	Monitoring only	1
SNOMED CT	24623002 |Screening mammography (procedure)|	Precoordinated Expression	1
SNOMED CT	248152002 |Female (finding)|	Female	1
SNOMED CT	262043009 |Partner in relationship (person)|	Significant other	1
SNOMED CT	263654008 |Abnormal (qualifier value)|	Abnormal image	1
SNOMED CT	33022008 |Hospital-based outpatient department (environment)|	Outpatient	1
SNOMED CT	392090004 |Operation on breast (procedure)|	Postcoordinated Expression	1
SNOMED CT	398166005 |Performed (qualifier value)|	Precoordinated Expression	4

System	Code	Display Text[a]	References[b]
SNOMED CT	451171000124107 |Appointed healthcare surrogate (person)|	Proxy	1
SNOMED CT	453231000124104 |Primary care provider (occupation)|	Primary Care Provider	1
SNOMED CT	57a30df3-8aea-4038-a55b-c1a245666f4e |Medical power of attorney (record artifact)|	Medical power of attorney	1
SNOMED CT	711299007 |Radiotherapy to thorax (procedure)|	Radiation therapy to chest before age of 30 years	1
SNOMED CT	77543007 |Ligation of fallopian tube (procedure)|	Tubal ligation	1
SNOMED CT	TSR-NoCode[c]	Precoordinated Expression	6
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[00baab-ba-6174-4ba0-81ac-fbf9ffe0b-d28 |Permanent implanted contraception (finding)]	Permanent implanted birth control	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[105726004 |Age AND/OR growth finding (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[115951000119105 |Breast symptom of change in skin (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[11779c10-f86f-44d6-b7f7-38ad-	Postcoordinated Expression	1

System	Code	Display Text[a]	References[b]
	cbf128e7	Focal pain of breast (finding)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[169449001 |Trying to conceive (finding)]	Attempting to conceive	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[237453001 |Cyclical mastalgia (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[248152002 | Female (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[254837009 |Malignant neoplasm of breast (disorder)]	Personal history of breast cancer	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[445333001 |Breast cancer genetic marker of susceptibility positive (finding)]	BRCA mutation carrier	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[449844005 |Breast prosthesis in situ (finding)]	Postcoordinated Expression	1

System	Code	Display Text[a]	References[b]
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation proce-dure (procedure)] ->(363702006 |Has focus (attribute))->[53430007 | Pain of breast (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation proce-dure (procedure)] ->(363702006 |Has focus (attribute))->[54302000 |Discharge from nipple (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Ob-servation procedure (pro-cedure)] ->(363702006 |Has focus (at-tribute))->[67b3628a-559f-4f45-9d84-e5dbb14b5298 |Nodulari-ty of tissue of breast (find-ing)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation proce-dure (procedure)] ->(363702006 |Has focus (attribute))->[762650003 | Uses contraception (find-ing)]	Using contraceptives	2
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation proce-dure (procedure)] ->(363702006 |Has focus (attribute))->[76498008 |Postmenopausal state (finding)]	Postmenopausal	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation proce-dure (procedure)] ->(363702006 |Has focus (attribute))->[77386006 | Pregnant (finding)]	Pregnant	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Ob-servation procedure (pro-	Postcoordinated Expression	1

System	Code	Display Text[a]	References[b]
	cedure)] ->(363702006 |Has focus (attribute))->[7c92d261-2f82-4a07-a9bb-b88fa7fa6ddf |Thickening of tissue of breast (finding)]		
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[89164003 | Breast lump (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[c76068c5-002d-4442-8795-5ce6662261f8 |Suspicious discharge from nipple (disorder)]	Suspicious	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[cbf03791-769c-403d-aac6-f6581bd103c8 |Nonspontaneous discharge from nipple (disorder)]	Nonspontaneous	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[d4398d10-bdb2-4353-8d-d5-63baa97ef026 |Breast tissue dense (finding)]	Dense breast tissue	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[54302000 |Discharge from nipple (disorder)]- ->(42752001 |Due to (at-	Normal lactation	1

System	Code	Display Text[a]	References[b]
	tribute))->[82374005 |Lactation normal (finding)];		

[a]If a code is used multiple times in the KNART, only the display text of the first instance is shown.

[b]Count of the number of times the given code system and code pair is used in the KNART.

[c]TSR-NoCode is a placeholder indicating a code was requested, but was not provided.

Chapter 13. Behavior Symbols

Table 13.1. 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 13.2. 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 13.3. 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.

Symbol	Name	Definition
✧	Could	An action with this behavior may be included in the set of actions processed by the end user.
➢	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 13.4. 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 13.5. 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 13.6. 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 13.7. Read Only Behavior

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

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])

[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])