

Women's Health: Breast Cancer Screening Rule

Rule: Conceptual Structure

**Contract: VA118-16-D-1008, Task Order
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Department of Veterans Affairs (VA)



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

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Women's Health: Breast Cancer Screening Rule: Rule: Conceptual Structure

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

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Preface

Table 1. Revision History

Date	Life Cycle Event
June 8, 2018	Published
April 17, 2018	Published
April 17, 2018	Reviewed
February 16, 2018	Created

Table 2. Clinical White Paper Contributors

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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	18bf1fa5-e352-5edb-8dd8-bc872a65d326	O4

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
PatientAgeGroup	Female outpatients ≥ 40 and < 45 years of age.			N/A	N/A
ClinicalFocus	Breast Cancer Screening			N/A	N/A
ClinicalVenue	Primary Care			N/A	N/A
ClinicalVenue	Obstetrics/Gynecology			N/A	N/A
ClinicalVenue	Women's Health			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. PatientGender

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)]]
--

Table 1.2. MammographyProcedure

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [71651007 Mammography (procedure)] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-12 Month)) high: elm:Today()
--

Table 1.3. EarlyChestRadiotherapy

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [108290001 Radiation oncology AND/OR radiotherapy (procedure)] dateRange[elm:Interval] low: () high: elm:Add(PatientAge elm:Quantity(30 Year))
--

Table 1.4. MammographyScreeningInterval

Expression: type=elm:Query Annotation: Codes: elm:value[elm:Code]: [398166005 Performed (qualifier value)]elm:value[elm:Code]: [268547008 Screening for malignant neoplasm of breast (procedure)]

Table 1.5. GeneticMarker

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[1e53d17c-cd1c-4251-ae9a-f7b999178c90 Breast cancer genetic marker of susceptibility finding]]elm:element[elm:Code]: [[a997cc03-3e99-40eb-833a-6374c7750a3a Observation procedure (procedure)] ->(363702006 Has focus (attribute))->[1e53d17c-cd1c-4251-ae9a-f7b999178c90 Breast cancer genetic marker of susceptibility finding (finding)]]

Table 1.6. ScreeningDueDate

Expression: type=elm:Query
Annotation:
Codes: elm:value[elm:Code]: [398166005 Performed (qualifier value)]elm:value[elm:Code]: [268547008 Screening for malignant neoplasm of breast (procedure)]elm:value[elm:Code]: [385643006 To be done (qualifier value)]

Table 1.7. ScreeningScheduleDate

Expression: type=elm:Query
Annotation:
Codes: elm:value[elm:Code]: [398166005 Performed (qualifier value)]elm:value[elm:Code]: [268547008 Screening for malignant neoplasm of breast (procedure)]elm:value[elm:Code]: [416151008 Scheduled - procedure status (qualifier value)]

Triggers

Table 1.8. duringEncounter

Trigger: type=DataEventTrigger, DataElementAccessed
Expression: type=elm:Instance
Annotation: Opening of the patient record during an encounter in either a primary care clinic, an OB/GYN or during a women's health outpatient visit
Codes:

Table 1.9. Activation of the breast cancer screening order set ECA rule

Trigger: type=DataEventTrigger, DataElementAdded
Expression: type=elm:Instance
Annotation: Activation of the breast cancer screening order set ECA rule.
Codes: elm:value[elm:Code]: [TSR-NoCode]

Table 1.10. EveryMonth

Trigger: type=PeriodicEventTrigger,
Expression: type=elm:Instance
Annotation:
Codes: elm:value[elm:Code]: [TSR-NoCode]

Chapter 2. Expression Definitions

Table 2.1. 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)]]

Chapter 3. Actions

General information
<p># prompt: Patient declines early breast cancer screening. response: Boolean (Single)</p> <p>responseBinding: Property ("declinesEarlyScreening")</p> <p># prompt: Patient declines breast cancer screening. response: Boolean (Single)</p> <p>responseBinding: Property ("declinesScreening")</p> <p># prompt: Patient desires to continue breast cancer screening. response: Boolean (Single)</p> <p>responseBinding: Property ("continueScreening")</p> <p># prompt: Patient has a personal history of breast cancer. response: Boolean (Single)</p> <p>responseBinding: Property ("hasPersonalHistoryOfBreastCancer")</p> <p># prompt: Patient has a life expectancy of greater than 10 years. response: Boolean (Single)</p> <p>responseBinding: Property ("hasExtendedLifeExpectancy")</p> <p># prompt: Auto generated patient notifications. response: Boolean (Single)</p> <p>responseBinding: Property ("autoGeneratedPatientNotifications")</p> <p>Condition:elm:And (elm:GreaterOrEqual(PatientAge elm:Quantity(40)) elm:Less(PatientAge elm:Quantity(45)))</p> <p>Condition:elm:Not (elm:Property("declinesEarlyScreening" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(MammographyScreeningInterval))</p> <p>Condition:elm:Not (elm:Exists(MammographyProcedure))</p> <p>Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(EarlyChestRadiotherapy))</p> <p>Condition:elm:Not (elm:Exists(GeneticMarker))</p>
Outpatient Visit, Age >=40 to <45 Years, Desires Early Breast Cancer Screening
<p># Set screening interval to annual.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression 268547008 Screening for malignant neoplasm of breast (procedure) </p> <p>result.lowerBound: 12</p> <p>result.upperBound: 12</p> <p>result.includeLowerBound: true</p>

```

        result.includeUpperBound: true
        result.resolution: 12
        result.measureSemantic: Precoordinated Expression 258706009 |month
        (qualifier value)|

# Notify the provider that options for breast cancer screening should be discussed with patient
and that the discussion should be documented.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
        statementType: Precoordinated Expression 385644000 |Requested (qual-
        ifier value)|
        topic: Postcoordinated Expression [409073007 |Education (procedure)] -
        >(363702006 |Has focus (attribute))->[268547008 |Screening for malign-
        ant neoplasm of breast (procedure)]

# Activate the breast cancer screening history section of the documentation template.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
        statementType: Precoordinated Expression 385644000 |Requested (qual-
        ifier value)|
        topic: Precoordinated Expression TSR-NoCode

# Activate the breast cancer risk assessment of the documentation template.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
        statementType: Precoordinated Expression 385644000 |Requested (qual-
        ifier value)|
        topic: Precoordinated Expression TSR-NoCode

# Activate the breast cancer screening order set ECA rule.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
        statementType: Precoordinated Expression 385644000 |Requested (qual-
        ifier value)|
        topic: Precoordinated Expression TSR-NoCode

Condition:elm:And (elm:GreaterOrEqual( PatientAge elm:Quantity(40 )) elm:Less( PatientAge
elm:Quantity(45 )))
Condition:elm:IsTrue (elm:Property("declinesEarlyScreening" from: elm:ParameterRef(Re-
sponses)))
Condition:elm:Not (elm:Exists( MammographyScreeningInterval ))
Condition:elm:Not (elm:Exists( MammographyProcedure ))
Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:Parameter-
Ref(Responses)))
Condition:elm:Not (elm:Exists( EarlyChestRadiotherapy ))
Condition:elm:Not (elm:Exists( GeneticMarker ))

```

Outpatient Visit, Age >=40 to <45 Years, No Desire for Early Breast Cancer Screening

```

# Activate declines breast cancer screening section of the documentation template.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
        statementType: Precoordinated Expression 385644000 |Requested (qual-
        ifier value)|
        topic: Precoordinated Expression TSR-NoCode

```

Set screening interval to declines early breast cancer screening.

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 268547008 |Screening for malignant neoplasm of breast (procedure)|

result.status: Precoordinated Expression 410528005 |Not wanted (qualifier value)|

Condition:elm:And (elm:GreaterOrEqual(PatientAge elm:Quantity(45)) elm:Less(PatientAge elm:Quantity(55)))

Condition:elm:Not (elm:Exists(MammographyProcedure))

Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:Parameter-Ref(Responses)))

Condition:elm:Not (elm:Exists(EarlyChestRadiotherapy))

Condition:elm:Not (elm:Exists(GeneticMarker))

Outpatient Visit, Age >=45 to <55 Years

Set screening interval to annual.

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 268547008 |Screening for malignant neoplasm of breast (procedure)|

result.lowerBound: 12

result.upperBound: 12

result.includeLowerBound: true

result.includeUpperBound: true

result.resolution: 12

result.measureSemantic: Precoordinated Expression 258706009 |month (qualifier value)|

Notify the provider that options for breast cancer screening should be discussed with patient and that the discussion should be documented.

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [409073007 |Education (procedure)] - >(363702006 |Has focus (attribute))->[268547008 |Screening for malignant neoplasm of breast (procedure)]

Activate the breast cancer screening history section of the documentation template.

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression TSR-NoCode

Activate the breast cancer risk assessment of the documentation template.

```

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |Requested (qual-
    ifier value)|
    topic: Precoordinated Expression TSR-NoCode
    # Activate the breast cancer screening order set ECA rule.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |Requested (qual-
    ifier value)|
    topic: Precoordinated Expression TSR-NoCode
Condition:elm:And (elm:GreaterOrEqual( PatientAge elm:Quantity(55 )) elm:Less( PatientAge
elm:Quantity(75 )))
Condition:elm:Not (elm:Exists( MammographyProcedure ))
Condition:elm:Not (elm:Exists( MammographyScreeningInterval ))
Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:Parameter-
Ref(Responses)))
Condition:elm:Not (elm:Exists( EarlyChestRadiotherapy ))
Condition:elm:Not (elm:Exists( GeneticMarker ))
Outpatient Visit, Age gt;=55 to <75 Years
    # Set screening interval to biennial.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |Requested (qual-
    ifier value)|
    topic: Precoordinated Expression 268547008 |Screening for malignant
    neoplasm of breast (procedure)|
    result.lowerBound: 24
    result.upperBound: 24
    result.includeLowerBound: true
    result.includeUpperBound: true
    result.resolution: 24
    result.measureSemantic: Precoordinated Expression 258706009 |month
    (qualifier value)|
    # Notify the provider that options for breast cancer screening should be discussed with patient
    and that the discussion should be documented.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |Requested (qual-
    ifier value)|
    topic: Postcoordinated Expression [409073007 |Education (procedure)] -
    >(363702006 |Has focus (attribute))->[268547008 |Screening for malig-
    nant neoplasm of breast (procedure)]
    # Activate the breast cancer screening history section of the documentation template.
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
    statementType: Precoordinated Expression 385644000 |Requested (qual-
    ifier value)|

```

<p>topic: Precoordinated Expression TSR-NoCode</p> <p># Activate the breast cancer screening documentation template.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p># Activate the breast cancer screening order set ECA rule.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p>Condition:elm:GreaterOrEqual (PatientAge elm:Quantity(75))</p> <p>Condition:elm:IsTrue (elm:Property("hasExtendedLifeExpectancy" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:IsTrue (elm:Property("continueScreening" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(MammographyProcedure))</p> <p>Condition:elm:Not (elm:Contains(MammographyScreeningInterval elm:Code()))</p> <p>Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(EarlyChestRadiotherapy))</p> <p>Condition:elm:Not (elm:Exists(GeneticMarker))</p>
<p>Outpatient Visit, Age >=75 Years, Desires to Continue Screening</p>
<p># Set screening interval to biennial.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression 268547008 Screening for malignant neoplasm of breast (procedure) </p> <p>result.lowerBound: 24</p> <p>result.upperBound: 24</p> <p>result.includeLowerBound: true</p> <p>result.includeUpperBound: true</p> <p>result.resolution: 24</p> <p>result.measureSemantic: Precoordinated Expression 258706009 month (qualifier value) </p> <p># Notify the provider that options for breast cancer screening should be discussed with patient and that the discussion should be documented.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Postcoordinated Expression [409073007 Education (procedure)] ->(363702006 Has focus (attribute))->[268547008 Screening for malignant neoplasm of breast (procedure)]</p>

<p># Activate the breast cancer screening history section of the documentation template.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p># Activate the breast cancer screening documentation template.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p># Activate the breast cancer screening order set ECA rule.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p>Condition:elm:GreaterOrEqual (PatientAge elm:Quantity(75))</p> <p>Condition:elm:IsTrue (elm:Property("hasExtendedLifeExpectancy" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:IsFalse (elm:Property("continueScreening" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(MammographyProcedure))</p> <p>Condition:elm:Not (elm:Contains(MammographyScreeningInterval elm:Code()))</p> <p>Condition:elm:Not (elm:Property("hasPersonalHistoryOfBreastCancer" from: elm:ParameterRef(Responses)))</p> <p>Condition:elm:Not (elm:Exists(EarlyChestRadiotherapy))</p> <p>Condition:elm:Not (elm:Exists(GeneticMarker))</p>
<p>Outpatient Visit, Age >=75 Years, Desires to Stop Screening</p>
<p># Set screening interval to stop screening.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression 268547008 Screening for malignant neoplasm of breast (procedure) </p> <p>result.status: Precoordinated Expression 410546004 Discontinued (qualifier value) </p> <p>Condition:elm:Exists (Activation of the breast cancer screening order set ECA rule)</p> <p>Condition:elm:Before (ScreeningDueDate elm:Add(elm:Now() elm:Quantity(60 days)))</p> <p>Condition:elm:IsFalse (elm:Exists(ScreeningScheduleDate))</p> <p>Condition:elm:Not (elm:Property("declinesScreening" from: elm:ParameterRef(Responses)))</p>
<p>Breast Cancer Screening Order Set ECA Rule</p>
<p># Activate the breast cancer screening order set.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p>

	<p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p>Condition:elm:Exists (EveryMonth)</p> <p>Condition:elm:In (ScreeningDueDate elm:Interval())</p> <p>Condition:elm:IsFalse (elm:Exists(ScreeningScheduleDate))</p> <p>Condition:elm:Not (elm:Property("declinesScreening" from: elm:ParameterRef(Responses)))</p>
Periodic System Run	
	<p>Condition:elm:IsTrue (elm:Property("autoGeneratedPatientNotifications" from: elm:ParameterRef(Responses)))</p>
	<p># Notify the patient of their Breast Cancer Screening due date.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p> <p>Condition:elm:IsFalse (elm:Property("autoGeneratedPatientNotifications" from: elm:ParameterRef(Responses)))</p>
	<p># Add the patient to the report of patients due for breast cancer screening with their Breast Cancer Screening due date.</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>statementType: Precoordinated Expression 385644000 Requested (qualifier value) </p> <p>topic: Precoordinated Expression TSR-NoCode</p>

Chapter 4. Tabular List

Terminology Service Request (TSR) Mappings

Table 4.1. Terminology Versions

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

Table 4.2. Terminology References

System	Code	Display Text ^a	References ^b
SNOMED CT	108290001 Radiation oncology AND/OR radiotherapy (procedure)	Precoordinated Expression	1
SNOMED CT	258706009 month (qualifier value)	Precoordinated Expression	4
SNOMED CT	268547008 Screening for malignant neoplasm of breast (procedure)	Precoordinated Expression	9
SNOMED CT	385643006 To be done (qualifier value)	Precoordinated Expression	1
SNOMED CT	385644000 Requested (qualifier value)	Precoordinated Expression	26
SNOMED CT	398166005 Performed (qualifier value)	Precoordinated Expression	4
SNOMED CT	410528005 Not wanted (qualifier value)	Precoordinated Expression	1
SNOMED CT	410546004 Discontinued (qualifier value)	Precoordinated Expression	3
SNOMED CT	416151008 Scheduled - procedure status (qualifier value)	Precoordinated Expression	1
SNOMED CT	71651007 Mammography (procedure)	Precoordinated Expression	1
SNOMED CT	TSR-NoCode ^c	Precoordinated Expression	18
SNOMED CT	[409073007 Education (procedure)] - >(363702006 Has focus (attribute))->[268547008 Screening for malignant neoplasm of breast (procedure)]	Postcoordinated Expression	4
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] -	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
	>(363702006 Has focus (attribute))->[1e53d17c-cd1c-4251-ae9a-f7b999178c90 Breast cancer genetic marker of susceptibility finding (finding)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a Observation procedure (procedure)] - >(363702006 Has focus (attribute))->[1e53d17c-cd1c-4251-ae9a-f7b999178c90 Breast cancer genetic marker of susceptibility finding]	Postcoordinated Expression	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))->[248152002 Female (finding)]	Postcoordinated Expression	2

^aIf a code is used multiple times in the KNART, only the display text of the first instance is shown.

^bCount of the number of times the given code system and code pair is used in the KNART.

^cTSR-NoCode is a placeholder indicating a code was requested, but was not provided.

Chapter 5. Behavior Symbols

Table 5.1. Group Organizational Behavior

Sym- bol	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 5.2. Group Selection Behavior

Sym- bol	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 5.3. Required Behavior

Sym- bol	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.

Sym- bol	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 5.4. Precheck Behavior

Sym- bol	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 5.5. Cardinality Behavior

Sym- bol	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 5.6. Item Flags

Sym- bol	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 5.7. Read Only Behavior

Sym- bol	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: Breast Cancer Screening Clinical Content White Paper*

[CSD] *Women's Health: Breast Cancer Screening Rule Conceptual Structure Document*

[KVRpt] *Women's Health: Breast Cancer Screening Rule KNART Validation Report*

Supporting Evidence

[Nelson 2009] *H. D. Nelson et al., Screening for Breast Cancer A Systematic Review to Update the 2009 U.S. Preventive Services Task Force Recommendation, Agency for Healthcare Research and Quality, USA, Jan. 2016.* (link [<https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening>])

[Oeffinger 2015] *Oeffinger, 2015. Oeffinger KC, Fontham ETH, Etzioni R, 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>])

[Pearlman 2017] *Pearlman, 2017. Pearlman M, Jeudy M, Chelmow D. Breast Cancer Risk Assessment and Screening in Average-Risk Women. OBSTETRICS AND GYNECOLOGY. 2017 Jul 1;130(1):E1-6* (link [<https://doi.org/10.1097/AOG.0000000000002158>])

[ACS 2017] *American Cancer Society Breast Cancer Screening Guidelines. American Cancer Society [Internet]. 2018 [cited 2018 Jan 24].* (link [<https://www.cancer.org/health-care-professionals/american-cancer-society-prevention-early-detection-guidelines/breast-cancer-screening-guidelines.html>])