Women's Health: Osteoporosis Screening Documentation Template

Documentation Template: Conceptual Structure

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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: Osteoporosis Screening Documentation Template: Documentation Template: 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 6, 2018	Published
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April 13, 2018	Reviewed
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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	7cbec1c9-a4ce-576b-872f-b11ff861f8f7	B50

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
PatientGender	Female			N/A	N/A
PatientAgeGroup	Population 18 years old or older			N/A	N/A
WorkflowSetting	Routine			N/A	N/A
TargetUser	Primary Care			N/A	N/A
TargetUser	Gynecology			N/A	N/A
ClinicalVenue	Outpatient			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

No externalData expression definitions and no trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Patient Preference for Screening

#	Patient preference for screening

	# ◆ prompt:	Preference
	response:	String (Single)
	response range:	EnumerationConstraint (List)
	item:	Screen as recommended
	item:	Screen on patient-preferred interval
	item:	Stop Screening

responseBinding: Property ("patientPreferredInterval")

Condition:elm:Equal (elm:Property("patientPreferredInterval" from: elm:ParameterRef(Responses)) elm:Literal())

	# prompt:	Interval (years between screening)
	response:	Integer (Single)
	# prompt:	Age (years)
	response:	Integer (Single)

responseBinding: Property ("patientAge")

	# ◆ prompt:	Postmenopausal?
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[76498008 |Postmenopausal state (finding)]
	response:	Boolean (Single)

responseBinding: Property ("postmenopausal")

	# ◆ prompt:	Previously diagnosed with osteoporosis?
	itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[64859006 |Osteoporosis (disorder)]
	response:	Boolean (Single)

Chapter 4. Age greater than or equal to 65 Years

Conditions
Condition:elm:GreaterOrEqual (elm:Property("patientAge" from: elm:ParameterRef(Responses)) elm:Literal())

  # Previously undergone DXA scanning?

prompt:

  re- Boolean (Single)

sponse:

 responseBinding: Property ("previouslyUndergoneDXAScanning")

#	**Condition:**elm:IsTrue (elm:Property("previouslyUndergoneDXAScanning" from: elm:Parame-terRef(Responses)))
✪ prompt:	Last DXA scan date
response:	Timestamp (Single)
✪ prompt:	Most recent T-score
itemCode:	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[3dfd49ed-a7e4-41a5-ab44-356015e345a2 |Dual energy X-ray photon absorptiometry scan T score]
response:	Code (Single)
response range:	EnumerationConstraint (List)
item:	Greater than or equal to -1.5([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[3dfd49ed-a7e4-41a5-ab44-356015e345a2 |Dual energy X-ray photon absorptiometry scan T score])
item:	Greater than -2.0 and less than -1.5([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[3dfd49ed-a7e4-41a5-ab44-356015e345a2 |Dual energy X-ray photon absorptiometry scan T score])
item:	Greater than or equal to -2.49 and less than or equal to -2([a997c-c03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[3dfd49ed-a7e4-41a5-ab44-356015e345a2 |Dual energy X-ray photon absorptiometry scan T score])

Chapter 5. Age Less Than 65 Years and Postmenopausal

Conditions
Condition:elm:And (elm:Less(elm:Property("patientAge" from: elm:ParameterRef(Responses)) elm:Literal()) elm:IsTrue(elm:Property("postmenopausal" from: elm:ParameterRef(Responses))))

#	❖	History of fragility fracture?
prompt:		
item-Code:		[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006	Has focus (attribute))->[268029009 |Pathological fracture (disorder)]
re-sponse:		Boolean (Single)

#		Body weight (pounds)
prompt:		
item-Code:		[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006	Has focus (attribute))->[107647005 |Weight finding (finding)]
re-sponse:		Integer (Single)

#	❖	Bone loss caused by medication or disease?
prompt:		
item-Code:		[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006	Has focus (attribute))->[703264005 |Secondary osteoporosis (disorder)]
re-sponse:		Boolean (Single)

responseBinding: Property ("boneLossCausedByMedicationOrDisease")

#	**Condition:**elm:IsTrue (elm:Property("boneLossCausedByMedicationOrDisease" from: elm:ParameterRef(Responses)))

# prompt:	Medications
response:	Code (Multiple)
response range:	EnumerationConstraint (List)
item:	Glucocorticoid therapy (5 mg per day for longer than 3 months) ([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[116596006 |Glucocorticoid preparation (product)])
item:	Anticonvulsant therapy greater than 2 years([416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[63094006 |Anticonvulsant (product)])
item:	Hypogonadism([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->48130008 |Hypogonadism (disorder)])
item:	Androgen deprivation therapy (ADT)(707266006 |Androgen deprivation therapy (procedure)|)

5

☞ item: Other

Details
___

\# prompt: Disease

response: Code (Multiple)

response range: EnumerationConstraint (List)

item: History of gastrectomy(53442002 |Gastrectomy (procedure)|)

item: History of malabsorption([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[32230006 |Malabsorption syndrome (disorder)])

item: History of celiac disease([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[396331005 |Celiac disease (disorder)])

item: History of metabolic surgery([a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[430715008 |Bariatric operative procedure (procedure)])

☞ item: Other

Details
___

\# ❖ Parental history of fragility fracture?
prompt:

item- [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |
Code: Has focus (attribute))->[268029009 |Pathological fracture (disorder)]

re- Boolean (Single)
sponse:

\# ❖ Current tobacco smoker?
prompt:

item- [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |
Code: Has focus (attribute))->[77176002 |Smoker (finding)]

re- Boolean (Single)
sponse:

\# ❖ Alcoholism?
prompt:

item- [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |
Code: Has focus (attribute))->[7200002 |Alcoholism (disorder)]

re- Boolean (Single)
sponse:

\# ❖ Rheumatoid arthritis?
prompt:

item- [a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |
Code: Has focus (attribute))->[69896004 |Rheumatoid arthritis (disorder)]

re- Boolean (Single)
sponse:

Chapter 6. Tabular List

Terminology Service Request (TSR) Mappings

Table 6.1. Terminology Versions

Name	Identifer	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301
RXNorm	2.16.840.1.113883.6.88	5-Mar-18
LOINC	2.16.840.1.113883.6.1	2.61

Table 6.2. Terminology References

System	Code	Display Text[a]	References[b]
SNOMED CT	53442002 |Gastrectomy (procedure)|	History of gastrectomy	1
SNOMED CT	707266006 |Androgen deprivation therapy (procedure)|	Androgen deprivation therapy (ADT)	1
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004	Direct substance (attribute))->[116596006	Glucocorticoid preparation (product)]	Glucocorticoid therapy (5 mg per day for longer than 3 months)	1
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004	Direct substance (attribute))->[63094006 |Anticonvulsant (product)]	Anticonvulsant therapy greater than 2 years	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->48130008	Hypogonadism (disorder)]	Hypogonadism	1
SNOMED CT	[a997cc03-3e99-40eb-833a-6374c7750a3a	Postcoordinated Expression	2

System	Code	Display Text[a]	References[b]
	|Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[268029009 | Pathological fracture (disorder)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[32230006 | Malabsorption syndrome (disorder)]	History of malabsorption	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[396331005 | Celiac disease (disorder)]	History of celiac disease	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[3dfd49ed-a7e4-41a5-ab44-356015e345a2 |Dual energy X-ray photon absorptiometry scan T score]	Greater than or equal to -1.5	4
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[430715008 | Bariatric operative procedure (procedure)]	History of metabolic surgery	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[64859006 | Osteoporosis (disorder)]	Postcoordinated Expression	1
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))->[69896004 | Rheumatoid arthritis (disorder)]		
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[703264005 |Secondary osteoporosis (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[7200002 |Alcoholism (disorder)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[76498008 |Postmenopausal state (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)] ->(363702006 |Has focus (attribute))->[77176002 | Smoker (finding)]	Postcoordinated Expression	1
SNOMED CT	[a997cc03-3e99-40e-b-833a-6374c7750a3a |Observation procedure (procedure)]- ->(363702006 |Has focus (attribute))->[107647005 | Weight finding (finding)]	Postcoordinated Expression	1

[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.

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.

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 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.

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: Osteoporosis Screening Clinical Content White Paper*

[CSD] *Women's Health: Osteoporosis Screening Documentation Template Conceptual Structure Document*

[KVRpt] *Women's Health: Osteoporosis Screening Documentation Template KNART Validation Report*

Supporting Evidence

[AGOG, 2012] *Committee on Practice Bulletins-Gynecology, ACOG. AGOG Practice Bulletin N. 129. Osteoporosis. Obstet Gynecol. 2012;120(3):718-734* (link [https://doi.org/10.1097/AOG.0b013e31826dc446])

[Cosman, 2014] *Cosman F, de Beur S.J., LeBoff M.S., Lewiecki E.M., Tanner B, Randall S, Lindsay R. Clinician's Guide to Prevention and Treatment of Osteoporosis. Osteoporosis International. 2014;25(10):2359-2381* (link [http://doi.org/10.1007/s00198-014-2794-2])

[Gourlay, 2012] *Gourlay ML, Fine JP, Preisser JS, May RC, Li C, Lui LY, Ransohoff DF, Cauley JA, Ensrud KE. Bone-density testing interval and transition to osteoporosis in older women. New England Journal of Medicine. 2012 Jan;19(366):225-33* (link [https://dx.doi.org/10.1056%2FNEJMoa1107142])

[NIH, 2017] *National Institutes of Health. Calcium Fact Sheet for Health Professionals. Accessed August 2017.* (link [https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/])

[USPSTF 2015] *USPSTF. Final Update Summary: Osteoporosis: U.S. Preventive Services Task Force website. Reviewed July 2015* (link [https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/osteoporosis-screening])