

Cardiology: Chest Pain/ Coronary artery disease (CAD) Documentation Template

Documentation Tem- plate: Conceptual Structure

**Contract: VA118-16-D-1008, Task Order
(TO): VA-118-16-F-1008-0007, CLIN0005AG**

Department of Veterans Affairs (VA)



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

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Cardiology: Chest Pain/Coronary artery disease (CAD) 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
March 21, 2018	Published
March 7, 2018	Pre-published
August 29, 2017	Pre-published
August 10, 2017	Created

Table 2. Clinical White Paper Contributors

Name	Role	Affiliation
Bruce Bray, MD	Author	Professor, Cardiovascular Medicine, University of Utah School of Medicine; Staff Cardiologist, Salt Lake City VA Medical Center (VAMC)
Scott Wall, MD	Author	Assistant Professor, Cardiovascular Medicine, University of Utah; School of Medicine Staff Cardiologist, Electrophysiology, Salt Lake City VAMC
Aiden Abidov, MD, PhD	Author	Professor of Medicine, Wayne State University; Section Chief, Cardiology, John Dingell VAMC

Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	cdf88754-ad05-53d2-a87d-1a959a52c8cb	B35

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
PatientAgeGroup	Population 18 years old or older			N/A	N/A
ClinicalFocus	Adult with stable chest pain being considered for cardiology consultation (excluding unstable symptoms and acute coronary syndromes)			N/A	N/A
ClinicalVenue	Outpatient			N/A	N/A
TargetUser	Provider in a Primary Care Clinic			N/A	N/A
WorkflowSetting	Primary Care			N/A	N/A

Models

Table 5. Model References

Referenced Model	Description
urn:solor.io:anf-model:0.8	VA Analysis Normal Form Model

Chapter 1. External Data Definitions

Definitions

Table 1.1. basicMetabolicProfileLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [bd01faa8-443c-4ad6-9cb6-ea50b4d7a093] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year)) high: elm:Today()
--

Table 1.2. completeBloodCountLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [26604007] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year)) high: elm:Today()
--

Table 1.3. lipidProfileLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [16254007] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year)) high: elm:Today()
--

Table 1.4. thyroidFunctionTestingLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [35650009] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year)) high: elm:Today()
--

Table 1.5. troponinLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [105000003]
--

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year))
high: elm:Today()

Table 1.6. brainNatriureticPeptideLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [390917008]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year))
high: elm:Today()

Table 1.7. dDimerLab

Expression: type=elm:Retrieve , dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [70648006]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Year))
high: elm:Today()

Table 1.8. 12LeadElectrocardiogram

Expression: type=elm:Retrieve , dataType=anf:ElectricalActivityEvaluationOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [80891009]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.9. 12LeadElectrocardiogramInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [18844-1]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.10. stressElectrocardiography

Expression: type=elm:Retrieve , dataType=anf:ElectricalActivityEvaluationOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [80891009]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.11. stressElectrocardiographyInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [76645-1]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.12. restingEchocardiogramDoppler

Expression: type=elm:Retrieve , dataType=anf:UltrasoundImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [80891009]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.13. restingEchocardiogramDopplerInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [18106-5]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.14. stressEchocardiogram

Expression: type=elm:Retrieve , dataType=anf:UltrasoundImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [80891009]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
high: elm:Today()

Table 1.15. stressEchocardiogramInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
Annotation:
Codes: elm:element[elm:Code]: [59282-4]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year)) high: elm:Today()

Table 1.16. stressMPI

Expression: type=elm:Retrieve , dataType=anf:RadionuclideImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [74281007] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year)) high: elm:Today()

Table 1.17. stressMPIInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [39730-7] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year)) high: elm:Today()
--

Table 1.18. restCoronaryMRI

Expression: type=elm:Retrieve , dataType=anf:MagneticResonanceImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [41801008] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year)) high: elm:Today()
--

Table 1.19. restCoronaryMRIInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [36009-9] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year)) high: elm:Today()
--

Table 1.20. stressCoronaryMRI

Expression: type=elm:Retrieve , dataType=anf:MagneticResonanceImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime Annotation: Codes: elm:element[elm:Code]: [41801008] dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))

high: elm:Today()

Table 1.21. stressCoronaryMRIInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [36009-9]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
--

high: elm:Today()

Table 1.22. chestCT

Expression: type=elm:Retrieve , dataType=anf:ComputedTomographyOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
--

Annotation:

Codes: elm:element[elm:Code]: [51185008]
--

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
--

high: elm:Today()

Table 1.23. chestCTInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [24627-2]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
--

high: elm:Today()

Table 1.24. coronaryCTA

Expression: type=elm:Retrieve , dataType=anf:ComputedTomographyOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
--

Annotation:

Codes: elm:element[elm:Code]: [41801008]
--

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
--

high: elm:Today()

Table 1.25. coronaryCTAInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime

Annotation:

Codes: elm:element[elm:Code]: [79073-3]

dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
--

high: elm:Today()

Table 1.26. xRayChest

Expression: type=elm:Retrieve , dataType=anf:RadiographicImagingOfBodyStructureAction, codeProperty=topicFocus, dateProperty=dateTime
 Annotation:
 Codes: elm:element[elm:Code]: [51185008]
 dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
 high: elm:Today()

Table 1.27. xRayChestInterpretation

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
 Annotation:
 Codes: elm:element[elm:Code]: [30745-4]
 dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-1 Year))
 high: elm:Today()

Table 1.28. priorCardiacDiagnosticProcedures

Expression: type=elm:Retrieve , dataType=anf:InterpretationOfRecordArtifactAction, codeProperty=topicFocus, dateProperty=dateTime
 Annotation:
 Codes: elm:element[elm:Code]: [80994-7]

Triggers

No trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Clinical Stability Assessment

This documentation template is not applicable for unstable patients

Ongoing resting chest pain for > 20 minutes with ST elevation or depression on ECG
prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("ongoingRestingChestPain")

Onset of new resting chest pain episodes within the past week
prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("onsetOfNewRestingChestPain")

New onset, recurrent chest pain with minimal exertion over the past 2 months
prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("onsetOfRecurrentChestPain")

Previously stable exertional angina now occurring with minimal activity over the past 2 months
prompt:

re- Boolean (Single)

sponse:

responseBinding: Property ("previouslyStableExertionalAngina")

Condition:elm:Or (elm:And(elm:Property("ongoingRestingChestPain" from: elm:ParameterRef(Responses)) elm:Property("onsetOfNewRestingChestPain" from: elm:ParameterRef(Responses))) elm:And(elm:Property("onsetOfRecurrentChestPain" from: elm:ParameterRef(Responses)) elm:Property("previouslyStableExertionalAngina" from: elm:ParameterRef(Responses))))

This documentation template is not applicable for use with patients who are unstable based on clinician judgement. Examples of unstable patients include, but are not limited to, patients with chest pain pattern suggestive of ACS (e.g., those with new onset resting CP, CP with minimal exertion, new unstable angina pattern, ST-segment elevation, non-ST-segment elevation myocardial infarction on ECG, or suspected aortic dissection), and patients with any of the following symptoms or findings:

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

topicFocus: Hospital-based outpatient emergency care center 73770003

The user will complete this section for a patient determined to be unstable.

prompt: Rationale for determining that the patient was unstable, noting that the patient was transferred to the nearest emergency department immediately.

response: String (Single)

| **responseBinding:** Property ("patientWasUnstable")

Chapter 4. Consult Request, Stable Patient

Conditions
Condition: elm:IsNull (elm:Property("patientWasUnstable" from: elm:ParameterRef(Responses)))

#	Coronary Artery Disease Risk
#	Provide a link to the American Heart Association Risk Calculator ([AHA Risk Calc]) American Heart Association Risk Calculator link [http://static.heart.org/riskcalc/app/index.html#!/baseline-risk] # For this documentation template, please assess the patient's 10-year cardiovascular disease risk using either clinical judgement or a risk calculator such as that provided by the AHA. Patient's 10-Year Cardiovascular Disease Risk prompt: Patient's 10-Year Cardiovascular Disease Risk response: String (Single)
#	History and Physical
	# prompt: History, Brief - describing symptoms, HPI response: String (Single) # prompt: History of prior cardiac evaluations (e.g., prior hospitalization or evaluations for: chest pain, rule/out MI, angina, heart failure, etc.) response: String (Single) # prompt: Results of prior cardiac diagnostic procedures performed (resting ECG, echocardiogram, stress testing (echo, nuclear, MRI), CCT or angiography) response: Tuple (Multiple) initialValue: priorCardiacDiagnosticProcedures # prompt: Physical Exam, Pertinent Positive and Negative Findings response: Code (Multiple) # prompt: Details of previous invasive diagnostic procedures and resulting interventions (e.g., angiography, PCI/Stents, or CABG) response: Code (Multiple)
#	Treatment Provided
	# prompt: Pharmacologic Therapy response: Code (Multiple) # prompt: Other Pertinent Therapy response: String (Single)
#	Laboratory Studies
	Each item in this section needs to include an expression, and a model (phenomenon testing result, thyroid result testing function measurement date within an interval of now to two years ago)

	<p># prompt: Basic Metabolic Profile Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	basicMetabolicProfileLab
	<p># prompt: Complete Blood Count Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	completeBloodCountLab
	<p># prompt: Lipid Profile Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	lipidProfileLab
	<p># prompt: Thyroid Function Testing Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	thyroidFunctionTestingLab
	<p># prompt: Troponin Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	troponinLab
	<p># prompt: Brain Natriuretic Peptide Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	brainNatriureticPeptideLab
	<p># prompt: D-dimer Lab Result between now and up-to 2 years ago</p> <p>response: Tuple (Multiple)</p>
initalValue:	dDimerLab
#	Imaging and Diagnostic Studies
	<p>Images and diagnostic studies older than one year are not considered for inclusion in this documentation template. For this documentation template, the following information should be included, if available from the prior 1 year. Image and result text should be attached automatically if they are is provided for the 12-Lead Electrocardiogram Interpretation field.</p>
	Attach or link results: 12-Lead Electrocardiogram Interpretation
	<p># prompt: resting 12-Lead Electrocardiogram Interpretation</p> <p>response: Tuple (Multiple)</p>
initalValue:	12LeadElectrocardiogramInterpretation
	Attach or link images: 12-Lead Electrocardiogram
	<p># prompt: resting 12-Lead Electrocardiogram</p> <p>response: Tuple (Multiple)</p>
initalValue:	12LeadElectrocardiogram
	Attach or link results: Stress Electrocardiography Interpretation
	<p># prompt: Stress Electrocardiography Interpretation</p> <p>response: Tuple (Multiple)</p>
initalValue:	stressElectrocardiographyInterpretation

Attach or link images: Stress Electrocardiography
prompt: Stress Electrocardiography response: Tuple (Multiple) initialValue: stressElectrocardiography
Attach or link results: Resting Echocardiogram/Doppler Interpretation
prompt: Resting Echocardiogram/Doppler Interpretation response: Tuple (Multiple) initialValue: restingEchocardiogramDopplerInterpretation
Attach or link images: Resting Echocardiogram/Doppler
prompt: Resting Echocardiogram/Doppler response: Tuple (Multiple) initialValue: restingEchocardiogramDoppler
Attach or link results: Stress Echocardiogram Interpretation
prompt: Stress Echocardiogram Interpretation response: Tuple (Multiple) initialValue: stressEchocardiogramInterpretation
Attach or link images: Stress Echocardiogram
prompt: Stress Echocardiogram response: Tuple (Multiple) initialValue: stressEchocardiogram
Attach or link results: Stress MPI Interpretation
prompt: Stress Myocardial Perfusion Imaging (MPI) Interpretation response: Tuple (Multiple) initialValue: stressMPIInterpretation
Attach or link images: Stress MPI
prompt: Stress Myocardial Perfusion Imaging (MPI) response: Tuple (Multiple) initialValue: stressMPI
Attach or link results: Rest MRI Interpretation
prompt: Rest Magnetic Resonance Imaging (MRI) Interpretation response: Tuple (Multiple) initialValue: restCoronaryMRIInterpretation
Attach or link images: Rest MRI
prompt: Rest Magnetic Resonance Imaging (MRI) response: Tuple (Multiple) initialValue: restCoronaryMRI
Attach or link results: Stress MRI Interpretation
prompt: Stress Magnetic Resonance Imaging (MRI) Interpretation response: Tuple (Multiple) initialValue: stressCoronaryMRIInterpretation

Attach or link images: Stress MRI
<p># prompt: Stress Magnetic Resonance Imaging (MRI)</p> <p>response: Tuple (Multiple)</p> <p>initialValue: stressCoronaryMRI</p>
Attach or link results: Chest CT results
<p># prompt: Chest CT Interpretation</p> <p>response: Tuple (Multiple)</p> <p>initialValue: chestCTInterpretation</p>
Attach or link images: Chest CT images
<p># prompt: Chest CT</p> <p>response: Tuple (Multiple)</p> <p>initialValue: chestCT</p>
Attach or link results: Coronary/Cardiac CTA Interpretation
<p># prompt: Coronary/Cardiac CTA Interpretation</p> <p>response: Tuple (Multiple)</p> <p>initialValue: coronaryCTAInterpretation</p>
Attach or link images: Coronary/Cardiac CTA
<p># prompt: Coronary/Cardiac CTA</p> <p>response: Tuple (Multiple)</p> <p>initialValue: coronaryCTA</p>
Attach or link results: X-Ray Chest Interpretation
<p># prompt: X-Ray Chest Interpretation</p> <p>response: Tuple (Multiple)</p> <p>initialValue: xRayChestInterpretation</p>
Attach or link images: X-Ray Chest
<p># prompt: X-Ray Chest</p> <p>response: Tuple (Multiple)</p> <p>initialValue: xRayChest</p>

Chapter 5. Tabular List

Terminology Service Request (TSR) Mappings

Table 5.1. Terminology Versions

Name	Identifier	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 5.2. Terminology References

System	Code	Display Text ^a	References ^b
LOINC	18106-5	Cardiac echo study Procedure	1
LOINC	18844-1	EKG impression Narrative	1
LOINC	24627-2	Chest CT	1
LOINC	30745-4	X-Ray Chest	1
LOINC	36009-9	MRA Heart	2
LOINC	39730-7	NM Heart perfusion W stress and W radionuclide IV	1
LOINC	59282-4	Stress cardiac echo study	1
LOINC	76645-1	Cardiac stress test EKG study Type [L]	1
LOINC	79073-3	CTA Heart and Coronary arteries W contrast IV	1
LOINC	80994-7	Coronary angiography performed	1
SNOMED CT	105000003	Troponin Lab Result	1
SNOMED CT	16254007	Lipid Profile Lab Result	1
SNOMED CT	26604007	Complete Blood Count Lab Result	1
SNOMED CT	35650009	Thyroid Function Testing Lab Result	1
SNOMED CT	390917008	Brain Natriuretic Peptide Lab Result	1
SNOMED CT	41801008	Coronary artery structure	3
SNOMED CT	51185008	Thoracic structure	2
SNOMED CT	70648006	D-dimer Lab Result	1
SNOMED CT	73770003	Hospital-based outpatient emergency care center	1
SNOMED CT	74281007	Myocardium structure	1
SNOMED CT	80891009	Heart structure	4
SNOMED CT	bd01faa8-443c-4ad6-9cb6-ea50b4d7a093	Basic Metabolic Profile Lab Result	1

^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.

Chapter 6. Behavior Symbols

Table 6.1. 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 6.2. 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 6.3. 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 6.4. 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 6.5. 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 6.6. 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 6.7. 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] *Cardiology: Chest Pain (CP) / Coronary Artery Disease (CAD) Clinical Content White Paper*

[CSD] *Cardiology: Chest Pain/Coronary artery disease (CAD) Documentation Template Conceptual Structure Document*

[KVRpt] *Cardiology: Chest Pain/Coronary artery disease (CAD) Documentation Template KNART Validation Report*

[AHA Risk Calc] *American Heart Association Risk Calculator* (link [<http://static.heart.org/riskcalc/app/index.html#!/baseline-risk>])

Supporting Evidence

[URL] *Cardiovascular disease (10-year risk) [Internet].: Framingham Heart Study; cited 2017]. Cardiovascular Disease (10-year risk). Available from: <https://www.framinghamheartstudy.org/risk-functions/cardiovascular-disease/10-year-risk.php>. (link [<https://www.framinghamheartstudy.org/risk-functions/cardiovascular-disease/10-year-risk.php>])*

[D'Agostino 2008] D'Agostino RB S, Vasan RS, Pencina MJ, Wolf PA, Cobain M, Massaro JM, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. *Circulation*. 2008 February 12;117(6):743-53 (link [<http://circ.ahajournals.org/content/117/6/743.long>])

[Fihn 2015] Fihn SD, Blankenship JC, Alexander KP, Bittl JA, Byrne JG, Fletcher BJ, et al. 2014 ACC/AHA/AATS/PCNA/SCAI/STS focused update of the guideline for the diagnosis and management of patients with stable ischemic heart disease: A report of the American college of cardiology/American heart association task force on practice guidelines, and the American association for thoracic surgery, preventive cardiovascular nurses association, society for cardiovascular angiography and interventions, and society of thoracic surgeons. *J Thorac Cardiovasc Surg*. 2015 March 01;149(3):5

[Gibbons 2002] Gibbons RJ, Balady GJ, Bricker JT, Chaitman BR, Fletcher GF, Froelicher VF, et al. ACC/AHA 2002 guideline update for exercise testing: summary article: A report of the American college of cardiology/American heart association task force on practice guidelines (committee to update the 1997 exercise testing guidelines). *Circulation*. 2002 October 01;106(14):1883-92.

[NLM 2017a] LABEL: ASPIRIN 81 MG- aspirin tablet, coated [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b4064039-2345-4227-b83d-54dc13a838d3>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b4064039-2345-4227-b83d-54dc13a838d3>])

[NLM 2017b] LABEL: CLOPIDOGREL- clopidogrel bisulfate tablet, film coated [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=edae8df1-caf9-ff72-1304-5ae8b355f8e7>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=edae8df1-caf9-ff72-1304-5ae8b355f8e7>])

- [NLM 2017c] LABEL: LIPITOR- atorvastatin calcium tablet, film coated [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=7fe85155-bc00-406b-b097-e8aece187a8a>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=7fe85155-bc00-406b-b097-e8aece187a8a>])
- [NLM 2017d] LABEL: METOPROLOL SUCCINATE EXTENDED-RELEASE - metoprolol succinate tablet, film coated, extended release [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2d948600-35d8-4490-983b-918bdce488c8>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2d948600-35d8-4490-983b-918bdce488c8>])
- [NLM 2017e] LABEL: NITROGLYCERIN- nitroglycerin tablet [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=67bf2a15-b115-47ac-ae28-ce2dafd6b5c9>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=67bf2a15-b115-47ac-ae28-ce2dafd6b5c9>])
- [NLM 2017f] LABEL: NORVASC- amlodipine besylate tablet [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=abd6a2ca-40c2-485c-bc53-db1c652505ed>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=abd6a2ca-40c2-485c-bc53-db1c652505ed>])
- [NLM 2017g] LABEL: SIMVASTATIN - simvastatin tablet [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5c1c694c-4b08-469e-b538-08e69df06146>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5c1c694c-4b08-469e-b538-08e69df06146>])
- [Skinner 2010] Skinner JS, Smeeth L, Kendall JM, Adams PC, Timmis A, Chest Pain Guideline Development Group. NICE guidance. Chest pain of recent onset: assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin. *Heart*. 2010 June 01;96(12):974-8. (link [<http://heart.bmj.com/content/96/12/974.long>])