Chest Pain (CP) / Coronary Artery Disease (CAD) Documentation Template

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

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Table of Contents

List of Tables

Preface

Table 1. Revision History

Date	Life Cycle Event
March 21, 2018	Published
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Table 2. Clinical White Paper Contributors

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Bruce Bray, MD	Author	Professor, Cardiovascular Medicine, University of Utah School of Medicine; Staff Cardiologist, Salt Lake City VA Medical Center (VAMC)
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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 Name	Code System	Code	Code System Version	Value Set	Value Set Version
PatientAgeGroup	Population 18 years old or older						
ClinicalFocus	Adult with stable chest pain being considered for cardiology consultation (excluding unstable symptoms and acute coronary syndromes)						
ClinicalVenue	Outpatient						
TargetUser	Provider in a Primary Care Clinic						
WorkflowSetting	Primary Care						

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

Table 1.1. basicMetabolicProfileLab

Expression: type=elm:Retrieve, dataType=anf:MeasurementOfLaboratoryTestAction, codeProperty=topicFocus, dateProperty=dateTime	
Annotation:	
Codes: elm:List	
	element[elm:Code]: Basic Metabolic Profile Lab Result 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:List	
	element[elm:Code]: Complete Blood Count Lab Result 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:List	
	element[elm:Code]: Lipid Profile Lab Result 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:List	
	element[elm:Code]: Thyroid Function Testing Lab Result 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:List	
	element[elm:Code]: Troponin Lab Result 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:List	
	element[elm:Code]: Brain Natriuretic Peptide Lab Result 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:List	
	element[elm:Code]: D-dimer Lab Result 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:List	
	element[elm:Code]: Heart structure 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:List	
	element[elm:Code]: EKG impression Narrative 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:List	
	element[elm:Code]: Heart structure 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:List	
	element[elm:Code]: Cardiac stress test EKG study Type [L] 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:List	
	element[elm:Code]: Heart structure 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:List	
	element[elm:Code]: Cardiac echo study Procedure 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:List	
	element[elm:Code]: Ultrasound imaging 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:List	
	element[elm:Code]: Stress cardiac echo study 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:List	
	element[elm:Code]: Myocardium structure 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:List	
	element[elm:Code]: NM Heart perfusion W stress and W radionuclide IV 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:List	
	element[elm:Code]: Coronary artery structure 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:List	
	element[elm:Code]: MRA Heart 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:List	
	element[elm:Code]: Coronary artery structure 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:List	
	element[elm:Code]: MRA Heart 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:List	
	element[elm:Code]: Thoracic structure 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:List	
	element[elm:Code]: Chest CT 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:List	
	element[elm:Code]: Coronary artery structure 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:List	
	element[elm:Code]: CTA Heart and Coronary arteries W contrast IV 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:List	
	element[elm:Code]: Thoracic structure 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:List	
	element[elm:Code]: X-Ray Chest 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:List
element[elm:Code]: Coronary angiography performed 80994-7

Chapter 2. Clinical Stability Assessment

This documentation template is not applicable for unstable patients

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

response: Boolean (Single)

responseBinding: Property ("ongoingRestingChestPain")

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

response: Boolean (Single)

responseBinding: Property ("onsetOfNewRestingChestPain")

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

response: Boolean (Single)

responseBinding: Property ("onsetOfRecurrentChestPain")

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

response: Boolean (Single)

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"

(Codes: 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 3. 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 Caclulator 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)

initalValue: 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

prompt: Basic Metabolic Profile Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: basicMetabolicProfileLab

prompt: Complete Blood Count Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: completeBloodCountLab

prompt: Lipid Profile Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: lipidProfileLab

prompt: Thyroid Function Testing Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: thyroidFunctionTestingLab

prompt: Troponin Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: troponinLab

prompt: Brain Natriuretic Peptide Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: brainNatriureticPeptideLab

prompt: D-dimer Lab Result between now and up-to 2 years ago

response: Tuple (Multiple)

initalValue: dDimerLab

Imaging and Diagnostic Studies

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.

Attach or link results: 12-Lead Electrocardiogram Interpretation

prompt: resting 12-Lead Electrocardiogram Interpretation

response: Tuple (Multiple)

initalValue: 12LeadElectrocardiogramInterpretation

Attach or link images: 12-Lead Electrocardiogram

prompt: resting 12-Lead Electrocardiogram

response: Tuple (Multiple)

initalValue: 12LeadElectrocardiogram

Attach or link results: Stress Electrocardiography Interpretation

prompt: Stress Electrocardiography Interpretation

response: Tuple (Multiple)

initalValue: stressElectrocardiographyInterpretation

Attach or link images: Stress Electrocardiography

prompt: Stress Electrocardiography
response: Tuple (Multiple)
initalValue: stressElectrocardiography

Attach or link results: Resting Echocardiogram/Doppler Interpretation

prompt: Resting Echocardiogram/Doppler Interpretation
response: Tuple (Multiple)
initalValue: restingEchocardiogramDopplerInterpretation

Attach or link images: Resting Echocardiogram/Doppler

prompt: Resting Echocardiogram/Doppler
response: Tuple (Multiple)
initalValue: restingEchocardiogramDoppler

Attach or link results: Stress Echocardiogram Interpretation

prompt: Stress Echocardiogram Interpretation
response: Tuple (Multiple)
initalValue: stressEchocardiogramInterpretation

Attach or link images: Stress Echocardiogram

prompt: Stress Echocardiogram
response: Tuple (Multiple)
initalValue: stressEchocardiogram

Attach or link results: Stress MPI Interpretation

prompt: Stress Myocardial Perfusion Imaging (MPI) Interpretation
response: Tuple (Multiple)
initalValue: stressMPIInterpretation

Attach or link images: Stress MPI

prompt: Stress Myocardial Perfusion Imaging (MPI)
response: Tuple (Multiple)
initalValue: stressMPI

Attach or link results: Rest MRI Interpretation

prompt: Rest Magnetic Resonance Imaging (MRI) Interpretation
response: Tuple (Multiple)
initalValue: restCoronaryMRIInterpretation

Attach or link images: Rest MRI

prompt: Rest Magnetic Resonance Imaging (MRI)
response: Tuple (Multiple)
initalValue: restCoronaryMRI

Attach or link results: Stress MRI Interpretation

prompt: Stress Magnetic Resonance Imaging (MRI) Interpretation
response: Tuple (Multiple)
initalValue: stressCoronaryMRIInterpretation

Attach or link images: Stress MRI

prompt: Stress Magnetic Resonance Imaging (MRI)
response: Tuple (Multiple)
initalValue: stressCoronaryMRI

Attach or link results: Chest CT results

prompt: Chest CT Interpretation
response: Tuple (Multiple)
initalValue: chestCTInterpretation

Attach or link images: Chest CT images

prompt: Chest CT
response: Tuple (Multiple)
initalValue: chestCT

Attach or link results: Coronary/Cardiac CTA Interpretation

prompt: Coronary/Cardiac CTA Interpretation
response: Tuple (Multiple)
initalValue: coronaryCTAInterpretation

Attach or link images: Coronary/Cardiac CTA

prompt: Coronary/Cardiac CTA
response: Tuple (Multiple)
initalValue: coronaryCTA

Attach or link results: X-Ray Chest Interpretation

prompt: X-Ray Chest Interpretation
response: Tuple (Multiple)
initalValue: xRayChestInterpretation

Attach or link images: X-Ray Chest

prompt: X-Ray Chest
response: Tuple (Multiple)
initalValue: xRayChest

Chapter 4. Tabular List

Terminology Service Request (TSR) Mappings

Table 4.1. Terminology References

System	Code	Display Text	References
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

Chapter 5. Behavior Symbols

Table 5.1. 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 5.2. 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 5.3. Required Behavior

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

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

Table 5.4. 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 5.5. 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 5.6. 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.

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] *Chest Pain (CP) / Coronary Artery Disease (CAD) Conceptual Structure*

[KVRpt] *Chest Pain (CP) / Coronary Artery Disease (CAD) KNART Validation Report*

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

Supporting Evidence

[Framingham Heart Study] *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*

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[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])

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[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])

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