

# **Cardiology: EP Arrhythmias- Syncope/Bradycardia Order Set**

## **Order Set: Conceptual Structure**

**Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007,  
CLIN0004AE**

**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: EP Arrhythmias-Syncope/Bradycardia Order Set: Order Set: Conceptual Structure**

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

Publication date 03/26/2018

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# Preface

**Table 1. Revision History**

Date	Life Cycle Event
March 26, 2018	Published
March 25, 2018	Reviewed
February 25, 2018	Reviewed
July 18, 2017	Created

**Table 2. Clinical White Paper Contributors**

Name	Role	Affiliation
Bray Bruce, MD	Author	Professor, Cardiovascular Medicine, University of Utah School of Medicine; Staff Cardiologist, Salt Lake City VA Medical Center
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**Table 3. Artifact Identifier**

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	2f1da8f8-1c06-575a-b49a-9c7be74cb440	B8

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# 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	Adult outpatient needing Cardiology consult for arrhythmia evaluation						
ClinicalVenue	Primary Care Clinic						
TargetUser	Clinical Providers in Primary Care Clinic						
WorkflowSetting	Cardiology Consultation						
WorkflowTask	Ensure a minimum workup is initiated prior to a Cardiology Consultation for adult patients who present to a Primary Care Clinic for evaluation of bradycardia, syncope, or near syncope						

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# Models

**Table 5. Model References**

Referenced Model	Description
urn:solor.io:anf-model:0.9	VA Analysis Normal Form Model

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# Chapter 1. Expression Definitions

**Table 1.1. 12LeadElectrocardiogram**

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic, dateProperty=datetime
Annotation:
Codes: elm:element[elm:Code]: [447113005  12 lead electrocardiogram at rest (procedure)]
dateRange[elm:Interval] low: elm:Add(elm:Today() elm:Quantity(-2 Month) )
high: elm:Today()

**Table 1.2. 12LeadElectrocardiogramPerformance**

Expression: type=elm:Query
Annotation: Resting 12-lead electrocardiogram to evaluate for arrhythmia
Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]



# Chapter 2. Bradycardia

## Consults and Referrals

Consider other consult modalities which may be available (e.g., e-consult or other rapidly iterative consult method). A simple consult is included here as the overarching clinical intent.

⊗ Referral to cardiology to evaluate bradycardia

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 183519002 | Referral to cardiology service (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[48867003 |Bradycardia (finding)])

⊗ Specific goal of the cardiology consultation (e.g., cardiology to manage patient, cardiology to risk stratify and recommend management, etc.)

⊗ prompt: Goal of cardiology consultation

response: String (Single)

## Imaging and ECG

Consider ordering prior to the cardiology consultation. Resting 12-lead electrocardiogram is required if it has not been obtained within the past two months.

**Condition:**elm:Not ( elm:Exists( 12LeadElectrocardiogramPerformance ) )

☐ Resting 12-lead electrocardiogram to evaluate for arrhythmia now

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 447113005 |12 lead electrocardiogram at rest (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[698247007 |Cardiac arrhythmia (disorder)] 49499008 |Stat (qualifier value)|)

☐ Echocardiogram to evaluate for left ventricular function now

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 40701008 |Echocardiography (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[366188009 |Finding of left ventricular function (finding)] 49499008 |Stat (qualifier value)|)

☐ Holter monitor to evaluate for bradycardia now

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

	<p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"</p> <p>(Codes: 385644000  Requested (qualifier value)  427047002   Holter extended electrocardiographic recording (procedure)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[48867003  Bradycardia (finding)] 49499008  Stat (qualifier value) )</p> <hr/> <p><input type="checkbox"/> Cardiac event monitor to evaluate for bradycardia now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"</p> <p>(Codes: 385644000  Requested (qualifier value)  395148004   Cardiac event recording (regime/therapy)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[48867003  Bradycardia (finding)] 49499008  Stat (qualifier value) )</p> <hr/> <p><input type="checkbox"/> X-ray chest to evaluate for heart failure now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"</p> <p>(Codes: 385644000  Requested (qualifier value)  399208008   Plain chest X-ray (procedure)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[84114007   Heart failure (disorder)] 49499008  Stat (qualifier value) )</p> <hr/>
Laboratory Tests	<p>Consider the following tests to be completed prior to the cardiology consultation.</p> <hr/> <p><input type="checkbox"/> Basic metabolic panel now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"</p> <p>(Codes: 385644000  Requested (qualifier value)  bd01faa8-443c-4ad6-9cb6-ea50b4d7a093  Basic metabolic profile (procedure) 49499008  Stat (qualifier value) )</p> <hr/> <p><input type="checkbox"/> Complete blood count now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"</p> <p>(Codes: 385644000  Requested (qualifier value)  26604007  Complete blood count (procedure)  49499008  Stat (qualifier value) )</p> <hr/> <p><input type="checkbox"/> Lipid panel now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"</p>

	(Codes: 385644000  Requested (qualifier value)  16254007  Lipid panel (procedure)  49499008  Stat (qualifier value) )
<input type="checkbox"/> Thyroid function testing now	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression" (Codes: 385644000  Requested (qualifier value)  35650009  Thyroid panel (procedure)  49499008  Stat (qualifier value) )
<input type="checkbox"/> Troponin now	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression" (Codes: 385644000  Requested (qualifier value)  105000003  Troponin measurement (procedure)  49499008  Stat (qualifier value) )
<input type="checkbox"/> Brain natriuretic peptide now	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression" (Codes: 385644000  Requested (qualifier value)  390917008  Brain natriuretic peptide measurement (procedure)  49499008  Stat (qualifier value) )
<input type="checkbox"/> D-dimer now	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression" (Codes: 385644000  Requested (qualifier value)  70648006  D-dimer assay (procedure)  49499008  Stat (qualifier value) )
Medications	
Consider discontinuation of nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.).	
<input type="checkbox"/> Discontinue nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.)	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Postcoordinated Expression topic:Postcoordinated Expression , unstructured[0]: Nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.)" (Codes: 385644000  Requested (qualifier value)  4701000124104  Recommendation to discontinue medication (procedure) )

# Chapter 3. Syncope/Presyncope

## Consults and Referrals

- ☐ Referral to cardiology to evaluate syncope

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 183519002 |Referral to cardiology service (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[271594007 |Syncope (disorder)])

- ☐ Referral to cardiology to evaluate presyncope

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 183519002 |Referral to cardiology service (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[427461000 |Near syncope (disorder)])

## Imaging and ECG

- ☐ Resting 12-lead electrocardiogram to evaluate for syncope/presyncope now

- ☐ Echocardiogram to evaluate for left ventricular function now

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , purpose[1]:Postcoordinated Expression , priority:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 447113005 |12 lead electrocardiogram at rest (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[271594007 |Syncope (disorder)] [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[427461000 |Near syncope (disorder)] 49499008 |Stat (qualifier value))

- ☐ Holter monitor to evaluate for syncope/presyncope now

⊙ prompt: Obtain Holter Monitor Evaluation Duration in Hours

response: Integer (Single)

response range: EnumerationConstraint (List)

item: 24 Hours

item: 48 Hours

⊗ item: Other duration of evaluation

**responseBinding:** Property ("holterMonitorDuration")

- ⊙ Holter monitor to evaluate for syncope/presyncope now

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , purpose[1]:Postcoordinated Expression , priority:Postcoordinated Expression , repetition.periodStart.in-

	<p>cludeLowerBound: TRUE , repetition.periodStart.lowerBound: now() , repetition.periodStart.includeUpperBound: FALSE , repetition.periodStart.upperBound: holterMonitorDuration , repetition.periodStart.measureSemantic:"</p> <p>(Codes: 385644000  Requested (qualifier value)  427047002  Holter extended electrocardiographic recording (procedure)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[271594007  Syncope (disorder)] [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[427461000  Near syncope (disorder)] 49499008  Stat (qualifier value)  258703001  day (qualifier value) )</p>
<input type="checkbox"/>	<p>Cardiac event monitor to evaluate for syncope/presyncope now</p> <hr/> <p>⊙ prompt: Other duration of evaluation  response: Integer (Single)  response range: EnumerationConstraint (List)  item: 24 Hours  item: 48 Hours  ☞ item: Other duration of evaluation</p> <p><b>responseBinding:</b> Property ("cardiacEventMonitorDuration")</p> <p>⊙ Cardiac event monitor to evaluate for syncope/presyncope now</p> <p>actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]</p> <p>"statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , purpose[1]:Postcoordinated Expression , priority:Postcoordinated Expression , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.lowerBound: now() , repetition.periodStart.includeUpperBound: FALSE , repetition.periodStart.upperBound: cardiacEventMonitorDuration , repetition.periodStart.measureSemantic:"</p> <p>(Codes: 385644000  Requested (qualifier value)  395148004  Cardiac event recording (regime/therapy)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[271594007  Syncope (disorder)] [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[427461000  Near syncope (disorder)] 49499008  Stat (qualifier value)  258703001  day (qualifier value) )</p>
<input type="checkbox"/>	<p>X-ray chest to evaluate for heart failure now</p> <hr/> <p>⊙ prompt: X-ray chest views  response: String (Single)  response range: EnumerationConstraint (List)  item: PA and lateral views  ☞ item: Other views</p>

	<p>⊙ X-ray chest to evaluate for heart failure now</p> <pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , purpose[0]:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  399208008  Plain chest X-ray (procedure)  [386053000  Evaluation procedure (procedure)] -&gt;(363702006  Has focus (attribute))-&gt;[84114007  Heart failure (disorder)] 49499008  Stat (qualifier value) ) </pre>
Laboratory Tests	
Consider the following tests to be completed prior to the cardiology consultation.	
<input type="checkbox"/> Basic metabolic panel now	<pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  bd01faa8-443c-4ad6-9cb6-ea50b4d7a093  Basic metabolic profile (procedure) 49499008  Stat (qualifier value) ) </pre>
<input type="checkbox"/> Complete blood count now	<pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  26604007  Complete blood count (procedure)  49499008  Stat (qualifier value) ) </pre>
<input type="checkbox"/> Lipid panel now	<pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  16254007  Lipid panel (procedure)  49499008  Stat (qualifier value) ) </pre>
<input type="checkbox"/> Thyroid function testing now	<pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  35650009  Thyroid panel (procedure)  49499008  Stat (qualifier value) ) </pre>
<input type="checkbox"/> Troponin now	<pre> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]     "statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"     (Codes: 385644000  Requested (qualifier value)  105000003  Troponin measurement (procedure)  49499008  Stat (qualifier value) ) </pre>
<input type="checkbox"/> Brain natriuretic peptide now	

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 390917008 |Brain natriuretic peptide measurement (procedure)| 49499008 |Stat (qualifier value)|)

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☐ D-dimer now

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , priority:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 70648006 |D-dimer assay (procedure)| 49499008 |Stat (qualifier value)|)

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Medications

Consider discontinuation of nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.).

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☐ Remove: Discontinue nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.)

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

"statementType:Postcoordinated Expression topic:Postcoordinated Expression , unstructured[0]: Nonessential negative chronotropic drugs (e.g., beta-blockers, calcium channel blockers, etc.)"

(Codes: 385644000 |Requested (qualifier value)| 4701000124104 |Recommendation to discontinue medication (procedure)|)

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# Chapter 4. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 4.1. Terminology References**

System	Code	Display Text	References
SNOMED CT	105000003  Troponin measurement (procedure)	Postcoordinated Expression	2
SNOMED CT	16254007  Lipid panel (procedure)	Postcoordinated Expression	2
SNOMED CT	183519002  Referral to cardiology service (procedure)	Postcoordinated Expression	3
SNOMED CT	258703001  day (qualifier value)		2
SNOMED CT	26604007  Complete blood count (procedure)	Postcoordinated Expression	2
SNOMED CT	35650009  Thyroid panel (procedure)	Postcoordinated Expression	2
SNOMED CT	385644000  Requested (qualifier value)	Postcoordinated Expression	28
SNOMED CT	390917008  Brain natriuretic peptide measurement (procedure)	Postcoordinated Expression	2
SNOMED CT	395148004  Cardiac event recording (regime/therapy)	Postcoordinated Expression	2
SNOMED CT	398166005  Performed (qualifier value)		1
SNOMED CT	399208008  Plain chest X-ray (procedure)	Postcoordinated Expression	2
SNOMED CT	40701008  Echocardiography (procedure)	Postcoordinated Expression	1
SNOMED CT	427047002  Holter extended electrocardiographic recording (procedure)	Postcoordinated Expression	2
SNOMED CT	447113005  12 lead electrocardiogram at rest (procedure)	Postcoordinated Expression	3
SNOMED CT	4701000124104  Recommendation to discontinue medication (procedure)	Postcoordinated Expression	2
SNOMED CT	49499008  Stat (qualifier value)	Postcoordinated Expression	23
SNOMED CT	70648006  D-dimer assay (procedure)	Postcoordinated Expression	2



System	Code	Display Text	References
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[271594007  Syncope (disorder)]	Postcoordinated Expression	2
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[366188009  Finding of left ventricular function (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[427461000  Near syncope (disorder)]	Postcoordinated Expression	2
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[48867003  Bradycardia (finding)]	Postcoordinated Expression	3
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[698247007  Cardiac arrhythmia (disorder)]	Postcoordinated Expression	1
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[84114007  Heart failure (disorder)]	Postcoordinated Expression	2
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[271594007  Syncope (disorder)]	Postcoordinated Expression	2
SNOMED CT	[386053000  Evaluation procedure (procedure)] ->(363702006  Has focus (attribute))->[427461000  Near syncope (disorder)]	Postcoordinated Expression	2
SNOMED CT	bd01faa8-443c-4ad6-9cb6-ea50b4d7a093  Basic metabolic profile (procedure)	Postcoordinated Expression	2

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# 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.

---

# 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: Electrophysiology (EP) Arrhythmias Clinical Content White Paper*

[CSD] *Cardiology: Electrophysiology (EP) Arrhythmias Conceptual Structure Document*

[KVRpt] *Cardiology: Electrophysiology (EP) Arrhythmias KNART Validation Report*

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

## Supporting Evidence

[Heidenreich 2016] *Heidenreich, P., Solis, P., Estes, M., Fonarow, G., Jurgens, C., Marine, J., McManus, D., McNamara, R. 2016 ACC/AHA Clinical Performance and Quality Measures for Adults With Atrial Fibrillation or Atrial Flutter. (2016) A Report of the American College of Cardiology/American Heart Association Task Force on Performance Measures* (link [<https://doi.org/10.1161/HQ.000000000000018>])

[Holbrook 2012] *Holbrook, A., Schulman, S., Witt, D., Vandvik, P., Fish, J., Kovacs, M., Svensson, P., Veenstra, D., Crowther, M., Guyatt, G., et al. Evidence-Based Management of Anticoagulant Therapy (2012). Official Publication of the American College of Chest Physicians. 2012 February 12;141(2):e152S-e184S* (link [<http://dx.doi.org/10.1378/chest.11-2295>])

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