

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

Publication date 03/29/2018

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# Preface

**Table 1. Revision History**

Date	Life Cycle Event
March 29, 2018	Published
March 29, 2018	Reviewed
December 8, 2017	Created
February 25, 2018	Reviewed

**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
Wall Scott, MD	Author	Assistant Professor, Cardiovascular Medicine, University of Utah; School of Medicine Staff Cardiologist, Salt Lake City VAMC
Abidov Aiden, MD	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	b098e1ee-609b-5225-b023-56083333057c	B36

---

# 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 atrial fibrillation, atrial flutter						

---

# Models

**Table 5. Model References**

Referenced Model	Description
urn:solor.io:anf-model:1.0	VA Analysis Normal Form Model

---

# Chapter 1. External Data Definitions

## Definitions

**Table 1.1. basicMetabolicPanelLabResult**

Expression: type=elm:Query Annotation: Basic Metabolic Panel Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [1421000205106  Basic metabolic panel (procedure)]
--

**Table 1.2. completeBloodCountLabResult**

Expression: type=elm:Query Annotation: Complete Blood Count Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [26604007  Complete blood count (procedure)]
---

**Table 1.3. lipidPanelLabResult**

Expression: type=elm:Query Annotation: Lipid Panel Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [16254007  Lipid panel (procedure)]
---

**Table 1.4. thyroidFunctionTestingLabResult**

Expression: type=elm:Query Annotation: Thyroid Function Testing Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [35650009  Thyroid panel (procedure)]
--

**Table 1.5. troponinLabResult**

Expression: type=elm:Query Annotation: Troponin Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [105000003  Troponin measurement (procedure)]
--

**Table 1.6. brainNatriureticPeptideLabResult**

Expression: type=elm:Query Annotation: Brain Natriuretic Peptide Lab Result Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)]elm:operand[elm:Code]: [407059007  Brain natriuretic peptide (substance)]
--

**Table 1.7. d-dimerLabResult**

Expression: type=elm:Query
----------------------------



Annotation: D-dimer Lab Result  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [70648006 |D-dimer assay (procedure)|]

**Table 1.8. resting12LeadElectrocardiogram**

Expression: type=elm:Query  
 Annotation: Resting 12-Lead Electrocardiogram Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [447113005 |12 lead electrocardiogram at rest (procedure)|]

**Table 1.9. resting12LeadElectrocardiogramInterpretation**

Expression: type=elm:Query  
 Annotation: Resting 12-Lead Electrocardiogram Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)|] ->(363702006 |Has focus (attribute))>[447113005 |12 lead electrocardiogram at rest (procedure)|]]

**Table 1.10. stressElectrocardiography**

Expression: type=elm:Query  
 Annotation: Stress Electrocardiography  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [46136006 |Electrocardiogram with exercise test (procedure)|]

**Table 1.11. stressElectrocardiographyInterpretation**

Expression: type=elm:Query  
 Annotation: Stress Electrocardiography Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)|] ->(363702006 |Has focus (attribute))>[46136006 |Electrocardiogram with exercise test (procedure)|]]

**Table 1.12. restingEchocardiogramDoppler**

Expression: type=elm:Query  
 Annotation: Resting Echocardiogram/Doppler  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [50871731-ba83-45bb-a582-a14943f1d06d |Echocardiography at rest (procedure)|]

**Table 1.13. restingEchocardiogramDopplerInterpretation**

Expression: type=elm:Query  
 Annotation: Resting Echocardiogram/Doppler Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)|]elm:operand[elm:Code]: [[370851004 |Evaluation of diagnostic study results (procedure)|] ->(363702006 |Has focus (attribute))>[50871731-ba83-45bb-a582-a14943f1d06d |Echocardiography at rest (procedure)|]]

**Table 1.14. stressEchocardiogram**

Expression: type=elm:Query  
 Annotation: Stress Echocardiogram  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [433233004 |Exercise stress echocardiography (procedure)]

**Table 1.15. stressEchocardiogramInterpretation**

Expression: type=elm:Query  
 Annotation: Stress Echocardiogram Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[433233004 |Exercise stress echocardiography (procedure)]]

**Table 1.16. stressMPI**

Expression: type=elm:Query  
 Annotation: Stress Myocardial Perfusion Imaging (MPI)  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)]

**Table 1.17. stressMPIInterpretation**

Expression: type=elm:Query  
 Annotation: Stress Myocardial Perfusion Imaging (MPI) Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)]]

**Table 1.18. stressMRI**

Expression: type=elm:Query  
 Annotation: Stress Magnetic Resonance Imaging (MRI)  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [737593009 |Magnetic resonance imaging of heart under stress (procedure)]

**Table 1.19. stressMRIInterpretation**

Expression: type=elm:Query  
 Annotation: Stress Magnetic Resonance Imaging (MRI) Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)||elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[737593009 |Magnetic resonance imaging of heart under stress (procedure)]]

**Table 1.20. chestCT**

Expression: type=elm:Query

Annotation: Chest CT  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [169069000 |Computed tomography of chest (procedure)]

**Table 1.21. chestCTInterpretation**

Expression: type=elm:Query  
 Annotation: Chest CT Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[169069000 |Computed tomography of chest (procedure)]]

**Table 1.22. chestCTA**

Expression: type=elm:Query  
 Annotation: Coronary/Cardiac CTA  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [419545005 |Computed tomography angiography of coronary arteries (procedure)]

**Table 1.23. cCTAInterpretation**

Expression: type=elm:Query  
 Annotation: Coronary/Cardiac CTA Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[419545005 |Computed tomography angiography of coronary arteries (procedure)]]

**Table 1.24. xRayChestInterpretation**

Expression: type=elm:Query  
 Annotation: X-Ray Chest Interpretation  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [399208008 |Plain chest X-ray (procedure)]

**Table 1.25. xRayChest**

Expression: type=elm:Query  
 Annotation: X-Ray Chest  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [[370851004 |Evaluation of diagnostic study results (procedure)] ->(363702006 |Has focus (at-  
 tribute))>[399208008 |Plain chest X-ray (procedure)]]

**Table 1.26. icdProcedure**

Expression: type=elm:Query  
 Annotation: Implantable Cardioverter-Defibrillator (ICD) Device Implantation"  
 Codes: elm:operand[elm:Code]: [398166005 |Performed (qualifier value)]elm:operand[elm:Code]:  
 [395218007 |Implantation of internal cardiac defibrillator (procedure)]

**Table 1.27. crtProcedure**

<p>Expression: type=elm:Query</p> <p>Annotation: Cardiac Resynchronization Therapy"</p> <p>Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)] elm:operand[elm:Code]: [1301000205107  Implantation of cardiac resynchronization therapy implantable pacemaker (procedure)]</p>
---

**Table 1.28. pacemakerProcedure**

<p>Expression: type=elm:Query</p> <p>Annotation: Cardiac Pacemaker Implantation"</p> <p>Codes: elm:operand[elm:Code]: [398166005  Performed (qualifier value)] elm:operand[elm:Code]: [307280005  Implantation of cardiac pacemaker (procedure)]</p>
--

**Table 1.29. cardiacDiagnosticProcedures**

<p>Expression: type=elm:List</p> <p>Annotation:</p> <p>Codes:</p>
---

---

## Chapter 2. Clinical Stability

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 Acute Coronary Syndrome ( ACS ), symptomatic hypotension, or unstable arrhythmia. Consider transferring these unstable patients to the nearest emergency department immediately.

☐ prompt: Acknowledge  
response: Boolean (Single)

# Chapter 3. History and Physical

History		
<input type="checkbox"/> prompt: History, Brief response: String (Single)		
<input type="checkbox"/> 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)		
<input type="checkbox"/> prompt: Results of prior cardiac diagnostic procedures performed (resting ECG, echocardiogram, stress testing (echo, nuclear, MRI), Cardiac CT ( CCT ) and Coronary CT Angiography ( CCTA ) response: Tuple (Single)		
<b>initialValue:</b> cardiacDiagnosticProcedures		
<input type="checkbox"/> prompt: Physical Exam, Pertinent Positive and Negative Findings response: String (Single)		
<input type="checkbox"/> prompt: Family History of response: Code (Single)		
response range: EnumerationConstraint (List)		
item: Sudden Unexplained Death(90049009   Unexplained sudden death (event)  )		
item: Drowning(40947009   Drowning (event)  )		
<input type="checkbox"/> prompt: Prior Radiofrequency Catheter Ablation response: Boolean (Single)		
Implanted Device History		
	If a device is selected, then enter Current arrhythmia device programmer interrogation report.	
		<input checked="" type="checkbox"/> prompt: Select at most one: response: Code (Single)
		response range: EnumerationConstraint (List)
		item: Prior Implantable Cardioverter-Defibrillator (ICD) Device Implantation(395218007   Implantation of internal cardiac defibrillator (procedure))
		item: Prior Cardiac Resynchronization Therapy plus Implantable Cardioverter-Defibrillator (CRT-D) Device Implantation(1301000205107   Implantation of cardiac resynchronization therapy implantable pacemaker (procedure))
		item: Prior Cardiac Pacemaker Implantation(307280005   Implantation of cardiac pacemaker (procedure))
	prompt: Current arrhythmia device programmer interrogation report	

|                      |                      response: String (Single)

---

## Chapter 4. Treatment Provided

- ☐ prompt: Pharmacologic Therapy  
response: String (Single)
- ☐ prompt: Other Pertinent Treatment  
response: String (Single)



---

# Chapter 5. Laboratory Studies

- ☐ prompt: Basic Metabolic Panel Lab Result  
response: Tuple (Single)  
**initialValue:** basicMetabolicPanelLabResult
- ☐ prompt: Complete Blood Count Lab Result  
response: Tuple (Single)  
**initialValue:** completeBloodCountLabResult
- ☐ prompt: Lipid Panel Lab Result  
response: Tuple (Single)  
**initialValue:** lipidPanelLabResult
- ☐ prompt: Thyroid Function Testing Lab Result  
response: Tuple (Single)  
**initialValue:** thyroidFunctionTestingLabResult
- ☐ prompt: Troponin Lab Result  
response: Tuple (Single)  
**initialValue:** troponinLabResult
- ☐ prompt: Brain Natriuretic Peptide Lab Result  
response: Tuple (Single)  
**initialValue:** brainNatriureticPeptideLabResult
- ☐ prompt: D-dimer Lab Result  
response: Tuple (Single)  
**initialValue:** d-dimerLabResult

---

# Chapter 6. Imaging and Diagnostic Studies

For this documentation template, the following information should be included, if available from the prior year.

Attach or link Results: 12-Lead Electrocardiogram

---

☐ prompt: Resting 12-Lead Electrocardiogram Interpretation  
response: Tuple (Multiple)

**initialValue:** resting12LeadElectrocardiogramInterpretation

Attach or link Images: 12-Lead Electrocardiogram

---

☐ prompt: Resting 12-Lead Electrocardiogram  
response: Tuple (Multiple)

**initialValue:** resting12LeadElectrocardiogram

Link results: Stress Electrocardiography

---

☐ prompt: Stress Electrocardiography Interpretation  
response: Tuple (Multiple)

**initialValue:** stressElectrocardiographyInterpretation

Link images: Stress Electrocardiography

---

☐ prompt: Stress Electrocardiography  
response: Tuple (Multiple)

**initialValue:** stressElectrocardiography

Link results: Resting Echocardiogram/Doppler

---

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

**initialValue:** restingEchocardiogramDopplerInterpretation

Link images: Resting Echocardiogram/Doppler

---

☐ prompt: Resting Echocardiogram/Doppler  
response: Tuple (Multiple)

**initialValue:** restingEchocardiogramDoppler

Link results: Stress Echocardiogram

---

☐ prompt: Stress Echocardiogram Interpretation  
response: Tuple (Multiple)

**initialValue:** stressEchocardiogramInterpretation

Link images: Stress Echocardiogram

---

☐ prompt: Stress Echocardiogram  
response: Tuple (Multiple)

**initialValue:** stressEchocardiogram

Link results: Stress MPI Interpretation

---

☐ prompt: Stress Myocardial Perfusion Imaging (MPI) Interpretation

response: Tuple (Multiple)

**initialValue:** stressMPIInterpretation

Link images: Stress MPI

---

☐ prompt: Stress Myocardial Perfusion Imaging (MPI)

response: Tuple (Multiple)

**initialValue:** stressMPI

Link results: Rest/Stress Magnetic Resonance Imaging (MRI) Interpretation

---

☐ prompt: Rest/Stress Magnetic Resonance Imaging (MRI) Interpretation

response: Tuple (Multiple)

**initialValue:** stressMRIInterpretation

Link images: Rest/Stress Magnetic Resonance Imaging (MRI)

---

☐ prompt: Rest/Stress Magnetic Resonance Imaging (MRI)

response: Tuple (Multiple)

**initialValue:** stressMRI

Link results: Chest CT

---

☐ prompt: Chest CT Interpretation

response: Tuple (Multiple)

**initialValue:** chestCTInterpretation

Link images: Chest CT

---

☐ prompt: Chest CT

response: Tuple (Multiple)

**initialValue:** chestCT

☐ prompt: Coronary/Cardiac CTA Interpretation

response: Tuple (Multiple)

**initialValue:** cCTAInterpretation

Link images: Coronary/Cardiac CTA

---

☐ prompt: Coronary/Cardiac CTA

response: Tuple (Multiple)

**initialValue:** chestCTA

Link results: X-Ray Chest

---

☐ prompt: X-Ray Chest Interpretation

response: Tuple (Multiple)

**initialValue:** xRayChestInterpretation

Link images: X-Ray Chest

---

☐ prompt: X-Ray Chest

response: Tuple (Multiple)

**initialValue:** xRayChest

---

# Chapter 7. Reason for Cardiology Arrhythmia Consult

Select one.

◉ prompt: Reason for consult:

response: Code (Single)

response EnumerationConstraint (List)

range:

item: Atrial Fibrillation Evaluation([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[49436004 |Atrial fibrillation (disorder)])

item: Atrial Flutter Evaluation([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[5370000 |Atrial flutter (disorder)])

item: Supraventricular Tachycardia Evaluation([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[5370000 |Atrial flutter (disorder)])

item: Syncope Evaluation([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[271594007 |Syncope (disorder)])

item: Presyncope Evaluation([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[271594007 |Syncope (disorder)])

☞ item: Other Arrhythmia Evaluation

Enter evaluation type

---

item: Pacemaker followup(1221000205105 |Cardiology consultation and report (procedure))

item: ICD follow-up(1221000205105 |Cardiology consultation and report (procedure))

item: Pacemaker generator change([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[3515001 |Replacement of electronic heart device, pulse generator (procedure)])

item: ICD generator change([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[395218007 |Implantation of internal cardiac defibrillator (procedure)])

item: Primary prevention pacemaker([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[307280005 |Implantation of cardiac pacemaker (procedure)])

item: ICD Implant([1221000205105 |Cardiology consultation and report (procedure)] ->(363702006 |Has focus (attribute))->[395218007 |Implantation of internal cardiac defibrillator (procedure)])

---

# Chapter 8. Stroke and Bleeding Risk

Ask the following questions and check any of the following that apply to the patient.

- ☐ prompt: Active problem of congestive heart failure or active problem of left ventricular systolic dysfunction?  
response: Boolean (Single)
- ☐ prompt: Active problem of hypertension?  
response: Boolean (Single)
- ☐ prompt: Age  $\geq 75$  years?  
response: Boolean (Single)
- ☐ prompt: Active problem of diabetes mellitus?  
response: Boolean (Single)
- ☐ prompt: History of stroke or of problem of transient ischemic attack or thromboembolism?  
response: Boolean (Single)
- ☐ prompt: Active problem of vascular disease?  
response: Boolean (Single)
- ☐ prompt: Age  $\geq 65$  years and age  $\leq 74$  years?  
response: Boolean (Single)
- ☐ prompt: Female?  
response: Boolean (Single)

---

# Chapter 9. Tabular List

## *Terminology Service Request (TSR) Mappings*

**Table 9.1. Terminology References**

System	Code	Display Text	References
SNOMED CT	105000003  Troponin measurement (procedure)	Precoordinated Expression	1
SNOMED CT	1221000205105  Cardiology consultation and report (procedure)	Pacemaker followup	2
SNOMED CT	1301000205107  Implantation of cardiac resynchronization therapy implantable pacemaker (procedure)	Precoordinated Expression	2
SNOMED CT	1421000205106  Basic metabolic panel (procedure)	Precoordinated Expression	1
SNOMED CT	16254007  Lipid panel (procedure)	Precoordinated Expression	1
SNOMED CT	16545191000119100  Radionuclide myocardial perfusion stress study (procedure)	Precoordinated Expression	1
SNOMED CT	169069000  Computed tomography of chest (procedure)	Precoordinated Expression	1
SNOMED CT	26604007  Complete blood count (procedure)	Precoordinated Expression	1
SNOMED CT	307280005  Implantation of cardiac pacemaker (procedure)	Precoordinated Expression	2
SNOMED CT	35650009  Thyroid panel (procedure)	Precoordinated Expression	1
SNOMED CT	395218007  Implantation of internal cardiac defibrillator (procedure)	Precoordinated Expression	2
SNOMED CT	398166005  Performed (qualifier value)	Precoordinated Expression	28
SNOMED CT	399208008  Plain chest X-ray (procedure)	Precoordinated Expression	1
SNOMED CT	407059007  Brain natriuretic peptide (substance)	Precoordinated Expression	1
SNOMED CT	40947009   Drowning (event)	Drowning	1

System	Code	Display Text	References
SNOMED CT	419545005  Computed tomography angiography of coronary arteries (procedure)	Precoordinated Expression	1
SNOMED CT	433233004  Exercise stress echocardiography (procedure)	Precoordinated Expression	1
SNOMED CT	447113005  12 lead electrocardiogram at rest (procedure)	Precoordinated Expression	1
SNOMED CT	46136006  Electrocardiogram with exercise test (procedure)	Precoordinated Expression	1
SNOMED CT	50871731-ba83-45bb-a582-a14943f1d06d   Echocardiography at rest (procedure)	Precoordinated Expression	1
SNOMED CT	70648006  D-dimer assay (procedure)	Precoordinated Expression	1
SNOMED CT	737593009   Magnetic resonance imaging of heart under stress (procedure)	Precoordinated Expression	1
SNOMED CT	90049009   Unexplained sudden death (event)	Sudden Unexplained Death	1
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] ->(363702006  Has focus (attribute))->[271594007   Syncope (disorder)]	Syncope Evaluation	2
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] ->(363702006  Has focus (attribute))->[307280005  Implantation of cardiac pacemaker (procedure)]	Primary prevention pacemaker	1
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] ->(363702006  Has focus (attribute))->[3515001   Replacement of electronic heart device, pulse generator (procedure)]	Pacemaker generator change	1
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] -	ICD generator change	2

System	Code	Display Text	References
	>(363702006  Has focus (attribute))->[395218007  Implantation of internal cardiac defibrillator (procedure)]		
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] - >(363702006  Has focus (attribute))->[49436004  Atrial fibrillation (disorder)]	Atrial Fibrillation Evaluation	1
SNOMED CT	[1221000205105  Cardiology consultation and report (procedure)] - >(363702006  Has focus (attribute))->[5370000  Atrial flutter (disorder)]	Atrial Flutter Evaluation	2
SNOMED CT	[370851004  Evaluation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[399208008  Plain chest X-ray (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evaluation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[419545005  Computed tomography angiography of coronary arteries (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evaluation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[433233004  Exercise stress echocardiography (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evaluation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[447113005  12 lead electrocardiogram at rest (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evaluation of diagnostic study	Postcoordinated Expression	1



System	Code	Display Text	References
	results (procedure)] - >(363702006  Has focus (attribute))->[46136006   Electrocardiogram with ex- ercise test (procedure)]		
SNOMED CT	[370851004  Evalu- ation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[50871731- ba83-45bb-a582- a14943f1d06d  Echocar- diography at rest (proce- dure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evalu- ation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[737593009   Magnetic resonance imag- ing of heart under stress (procedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evaluation of diagnostic study results (procedure)] ->(363702006  Has focus (at- tribute))->[16545191000119100  Radionuclide myocardial perfusion stress study (pro- cedure)]	Postcoordinated Expression	1
SNOMED CT	[370851004  Evalu- ation of diagnostic study results (procedure)] - >(363702006  Has focus (attribute))->[169069000   Computed tomography of chest (procedure)]	Postcoordinated Expression	1

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# Chapter 10. Behavior Symbols

**Table 10.1. 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 10.2. 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 10.3. 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 10.4. 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 10.5. 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 10.6. 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.

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# 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: (EP) Arrhythmias Clinical Content White Paper*

[CSD] *(EP) Arrhythmias Conceptual Structure Document*

[KVRpt] *(EP) Arrhythmias KNART Validation Report*

## 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. *Circulation: Cardiovascular Quality and Outcomes*. 2016;9:443-488 Originally published June 27, 2016. doi:10.1161/HCQ.000000000000018 (link [<https://doi.org/10.1161/HCQ.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>])

[January 2014] January, C. T., Wann, L. S., Alpert, J. S., Calkins, H., Cigarroa, J. E., Cleveland, J. C., ... Yancy, C. W. (2014). 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: Executive summary: A report of the American College of cardiology/American heart association task force on practice guidelines and the heart rhythm society. *Circulation*, 130(23), 2071-2104 (link [<https://doi.org/10.1161/CIR.000000000000040>])

[Kearon 2016] Kearon, C., Aki, E., Ornelas, J., Blaivas, A., Jimenez, D., Bounameaux, H., et al. Antithrombotic therapy for VTE disease: CHEST guideline and expert panel report. (2016) *HEST Journal, Official Publication of the College of Chest Physicians* 2016 February 149(2) 315–352 (link [<http://dx.doi.org/10.1016/j.chest.2015.11.026>])

[Page 2016] Page, R., Joglar, J., Caldwell, M., Calkins, H., Conti, J., Deal, B., Estes, M., Field, M., Goldberger, Z., Hammill, S., Indik, J., Lindsay, B., et al. 2015 ACC/AHA/HRS Guideline for the Management of Adult Patients With Supraventricular Tachycardia. (2016) *Journal of the American College of Cardiology Volume 67, Issue 13, April 2016* (link [[http://www.onlinejacc.org/content/67/13/e27?\\_ga=1.87330320.984974867.1480494374](http://www.onlinejacc.org/content/67/13/e27?_ga=1.87330320.984974867.1480494374)])

[Shen 2017] Shen, W.K., Sheldon, R., Benditt, D., Cohen, M., Forman, D., Goldberger, Z., Grubb, B., Field, M., Goldberger, Z., Hamdan, M., Krahn, A., Link, M., Olshansky, B., et al. 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, and the Heart Rhythm Society.. August 2017 Volume 14, Issue 8, Pages e155–e21 (link [<http://dx.doi.org/10.1016/j.hrthm.2017.03.004>])

[NLM 2017a] LABEL: AMIODARONE HCL- amiodarone hydrochloride tablet [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=08641e51-ab->

- ca-4c1c-ba19-d24435332018*. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=08641e51-abca-4c1c-ba19-d24435332018>])
- [NLM 2017b] 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-54d-c13a838d3>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b4064039-2345-4227-b83d-54d-c13a838d3>])*
- [NLM 2016a] LABEL: *CARDIZEM- diltiazem hydrochloride tablet, coated [Internet].: National Library of Medicine; 2016. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f3e7ecef-f360-4987-a4f5-933214130ab2>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f3e7ecef-f360-4987-a4f5-933214130ab2>])*
- [NLM 2017c] LABEL: *CLOPIDOGREL- clopidogrel bisulfate tablet, film coated, [Internet].: National Library of Medicine; 2016. 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 2017d] LABEL: *COUMADIN- warfarin sodium tablet, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/lookup.cfm?setid=d91934a0-902e-c26c-23ca-d5acc4151b6>. (link [<https://dailymed.nlm.nih.gov/dailymed/lookup.cfm?setid=d91934a0-902e-c26c-23ca-d5acc4151b6>])*
- [NLM 2016b] LABEL: *DIGOXIN- digoxin tablet, [Internet].: National Library of Medicine; 2016. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=dfac7f13-28be-423d-9389-9089da29da17>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=dfac7f13-28be-423d-9389-9089da29da17>])*
- [NLM 2016c] LABEL: *DILTIAZEM HCL CD- diltiazem hydrochloride capsule, coated, extended release, [Internet].: National Library of Medicine; 2016. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5e39be50-ea17-4077-a2dc-668267049f6a>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5e39be50-ea17-4077-a2dc-668267049f6a>])*
- [NLM 2017e] LABEL: *ELIQUIS- apixaban tablet, film coated ELIQUIS 30-DAY STARTER PACK- apixaban, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=e9481622-7cc6-418a-acb6-c5450daae9b0>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=e9481622-7cc6-418a-acb6-c5450daae9b0>])*
- [NLM 2012] LABEL: *FLECAINIDE ACETATE- flecainide tablet, [Internet].: National Library of Medicine; 2012. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=fa68b35e-9f50-408b-9e70-e84cecf3fd6e>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=fa68b35e-9f50-408b-9e70-e84cecf3fd6e>])*
- [NLM 2008] LABEL: *ISOPTIN SR- verapamil hydrochloride tablet, coated, [Internet].: National Library of Medicine; 2018. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6ae13cb4-0316-40d1-9216-c7d5556aaed3>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6ae13cb4-0316-40d1-9216-c7d5556aaed3>])*
- [NLM 2017f] LABEL: *LOPRESSOR- metoprolol tartrate tablet, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0283bc9d-6998-493a-824a-d4c85f704111>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0283bc9d-6998-493a-824a-d4c85f704111>])*
- [NLM 2017g] LABEL: *PRADAXA- dabigatran etexilate mesylate capsule, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ba74e3cd-b06f-4145-b284-5fd6b84ff3c9>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ba74e3cd-b06f-4145-b284-5fd6b84ff3c9>])*

- [NLM 2017h] *LABEL: PROPAFENONE HCL- propafenone hydrochloride tablet, film coated, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a313c111-e539-47bc-9d57-c3767f74bcca>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a313c111-e539-47bc-9d57-c3767f74bcca>])*
- [NLM 2017i] *LABEL: TOPROL XL- metoprolol succinate tablet, extended release, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=4a5762c6-d7a2-4e4c-10b7-8832b36fa5f4>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=4a5762c6-d7a2-4e4c-10b7-8832b36fa5f4>])*
- [NLM 2017j] *LABEL: XARELTO- rivaroxaban tablet, film coated, [Internet].: National Library of Medicine; 2017. Available from: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=10db92f9-2300-4a80-836b-673e1ae91610>. (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=10db92f9-2300-4a80-836b-673e1ae91610>])*