Cardiology: Pre-Cardiac Catheterization Order Set

Order Set: Conceptual Structure

Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0008BA

Department of Veterans Affairs (VA)

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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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Preface

Table 1. Revision History

Date	Life Cycle Event
April 27, 2018	Published
April 27, 2018	Reviewed
April 2, 2018	Reviewed
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Table 2. Clinical White Paper Contributors

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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	9a42ab9d-ee66-57a5-aa54-c3055a9ff1fc	O18

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Cardiologists			N/A	N/A
ClinicalFocus	Adult Catheterization lab patients			N/A	N/A
ClinicalVenue	Inpatient			N/A	N/A
ClinicalVenue	Cardiology Service			N/A	N/A
PatientAgeGroup	Adult patients with suspected cardiac disease requiring invasive diagnosis and/or treatment	SNOMED CT	133936004 |Adult (person)|	N/A	N/A
PatientGender	All			N/A	N/A
WorkflowTask	Cardiac Catheterization			N/A	N/A

Models

Table 5. Model References

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

Chapter 1. External Data Definitions

No external data expression definitions and no trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Medication Orders

Order Pre Cardiac Catheterization Medications

	Oral Contrast Allergy Premedication Regimen
	✪ Prednisone 50 mg tablet oral 1 time 13 hours before procedure
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 1 , requestedResult.upperBound: 1 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;198148 predniSONE 50 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)|)
	✪ Prednisone 50 mg tablet oral 1 time 7 hours before procedure
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 1 , requestedResult.upperBound: 1 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;198148 predniSONE 50 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)|)
	✪ Prednisone 50 mg tablet oral 1 time 1 hour before procedure

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 1 , requestedResult.upperBound: 1 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;198148 predniSONE 50 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)|)

✪ Diphenhydramine 50 mg tablet oral 1 time 1 hour before procedure

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 1 , requestedResult.upperBound: 1 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1085945 diphenhydrAMINE Hydrochloride 50 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)|)

✪ Cimetidine 300 mg tablet oral 1 time 1 hour before procedure

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound:

1 , requestedResult.upperBound: 1 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;197506 Cimetidine 300 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)|)

Intravenous Contrast Allergy Premedication Regimen

✪ Hydrocortisone 200 mg solution intraveneous 1 time 4 hours before procedure

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 200 , requestedResult.upperBound: 200 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1164003 Hydrocortisone Injectable Product] ->(410675002 |Route of administration (attribute))->[255560000 |Intravenous (qualifier value)] 258684004 |milligram (qualifier value)|)

✪ Diphenhydromine 50 mg solution intraveneous 1 time 4 hours before procedure

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.lowerBound: 50 , requestedResult.upperBound: 50 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , request-

| | | edResult.measureSemantic:Precoordinated Expression" |
| | | (Codes: 385644000 \|Requested (qualifier value)\| [416118004 \|Administration (procedure)] ->(260686004 \|Method (attribute))->[129445006 \|Administration - action (qualifier value)] ->(363701004 \|Direct substance (attribute))->[Rx;1158446 diphenhydrAMINE Injectable Product] ->(410675002 \|Route of administration (attribute))->[255560000 \|Intravenous (qualifier value)] 258684004 \|milligram (qualifier value)\|) |

Hold Medication Orders

Hold and restart orders for patients taking insulin, metformin, anticoagulants, or aspirin

☐	insulin	
	◎ prompt:	Restart timeframe?
	response:	Integer (Single)
	responseBinding:	Property ("restartTimeframe")
	◎ Hold insulin per Cardiac Catheterization Guidelines	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: restartTimeframe , timing.upperBound: restartTimeframe , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"
		(Codes: 385644000 |Requested (qualifier value)| [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[67866001 |Insulin (substance)];)
☐	metformin	
	◎ Hold metformin per Cardiac Catheterization Guidelines	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Postcoordinated Expression"
		(Codes: 385644000 |Requested (qualifier value)| [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;6809 metFORMIN];)
	◎ Restart metformin within specified timeframe	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [182837001 |Restart of medication (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;6809 metFORMIN];)

☐ anticoagulants

◎ Hold anticoagulants per Cardiac Catheterization Guidelines

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[372862008 |Anticoagulant (substance)];)

◎ prompt: Restart timeframe?

response: String (Single)

☐ aspirin

◎ Hold aspirin per Cardiac Catheterization Guidelines
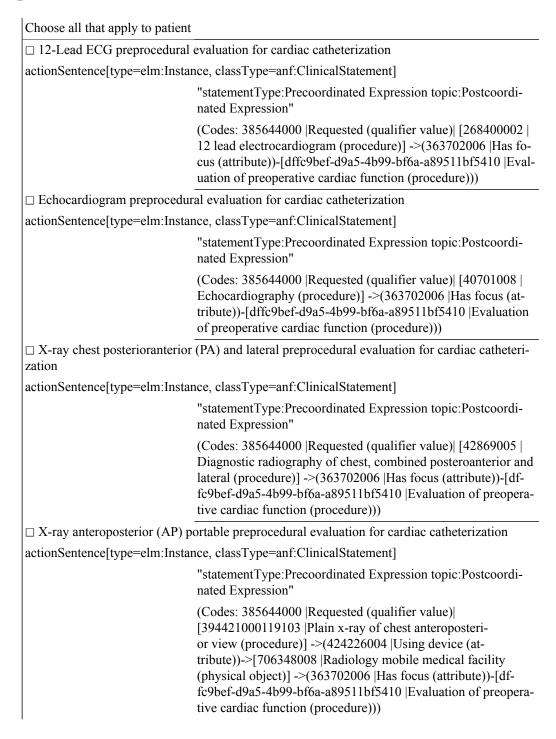
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;1191 Aspirin];)

◎ prompt: Restart timeframe?

response: String (Single)

Chapter 4. Laboratory Tests

Possible laboratory tests and order schedules for patients who will undergo cardiac catheterization.

	Comprehensive Metabolic Profile	
	☐ STAT	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Precoordinated Expression"
		(Codes: 385644000 |Requested (qualifier value)| 1411000205104 |Comprehensive metabolic panel (procedure))
	☐ Today	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Postcoordinated Expression"
		(Codes: 385644000 |Requested (qualifier value)| 1411000205104 |Comprehensive metabolic panel (procedure))
	☐ Upon admission to the catheterization lab	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"
		(Codes: 385644000 |Requested (qualifier value)| 1411000205104 |Comprehensive metabolic panel (procedure)
	☐	◉ prompt: Time for lab draw?
		response: Timestamp (Single)
		responseBinding: Property ("timeForLabDraw")
		◉ Comprehensive Metabolic Profile at specified time
		actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
		"statementType:Precoordinated Expression topic:Precoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"
		(Codes: 385644000 |Requested (qualifier value)| 1411000205104 |Comprehensive metabolic panel (procedure)
	Complete Blood Count	
	☐ STAT	
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
		"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 26604007 |Complete blood count (procedure)|)

☐ Today

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 26604007 |Complete blood count (procedure)|)

☐ Upon admission to the catheterization lab

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"

(Codes: 385644000 |Requested (qualifier value)| 26604007 |Complete blood count (procedure)|)

☐

⊙ prompt: Time for lab draw?

response: Timestamp (Single)

⊙ Complete Blood Count at specified time

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"

(Codes: 385644000 |Requested (qualifier value)| 26604007 |Complete blood count (procedure)|)

Brain natriuretic peptide

☐ STAT

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

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

☐ Today

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

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

☐ Upon admission to the catheterization lab

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

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

□

◎ prompt: Test time?

response: Timestamp (Single)

responseBinding: Property ("testTime")

◎ Brain natriuretic peptide test at specified time

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , timing.lowerBound: testTime , timing.upperBound: testTime , timing.includeLowerBound: TRUE , timing.includeUpperBound: TRUE"

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

International Normalized Ratio (INR)

□ STAT

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 440685005 |Calculation of international normalized ratio (procedure)|)

□ Today

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Today"

(Codes: 385644000 |Requested (qualifier value)| 440685005 |Calculation of international normalized ratio (procedure)|)

□ Upon admission to the catheterization lab

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"

(Codes: 385644000 |Requested (qualifier value)| 440685005 |Calculation of international normalized ratio (procedure)|)

□

◎ prompt: Time for lab draw?

response: Timestamp (Single)

responseBinding: Property ("timeForLabDraw")

◎ INR test at specified time

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"

> (Codes: 385644000 |Requested (qualifier value)| 440685005 |Calculation of international normalized ratio (procedure)|)

Troponin

□ STAT

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"

> (Codes: 385644000 |Requested (qualifier value)| 105000003 |Troponin measurement (procedure)|)

□ Today

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Today"

> (Codes: 385644000 |Requested (qualifier value)| 105000003 |Troponin measurement (procedure)|)

□ Upon admission to the catheterization lab

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"

> (Codes: 385644000 |Requested (qualifier value)| 105000003 |Troponin measurement (procedure)|)

□

> ◎ prompt: Time for lab draw?
>
> response: Timestamp (Single)

◎ Troponin test at specified time

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"

> (Codes: 385644000 |Requested (qualifier value)| 105000003 |Troponin measurement (procedure)|)

Magnesium

□ STAT

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression"

> (Codes: 385644000 |Requested (qualifier value)| 38151008 |Magnesium measurement (procedure)|)

☐ Today

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression , unstructured[0]: Today"

> (Codes: 385644000 |Requested (qualifier value)| 38151008 |Magnesium measurement (procedure)|)

☐ Upon admission to the catheterization lab

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"

> (Codes: 385644000 |Requested (qualifier value)| 38151008 |Magnesium measurement (procedure)|)

> ☐
>
> > ◎ prompt: Time for lab draw?
> >
> > response: Timestamp (Single)
>
> ◎ Magnesium test specified time
>
> actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
>
> > "statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"
> >
> > (Codes: 385644000 |Requested (qualifier value)| 38151008 |Magnesium measurement (procedure)|)

aPTT

☐ STAT

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"

> (Codes: 385644000 |Requested (qualifier value)| 42525009 |Partial thromboplastin time, activated (procedure)|)

☐ Today

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Today"

(Codes: 385644000 |Requested (qualifier value)| 42525009 |Partial thromboplastin time, activated (procedure)|)

☐ Upon admission to the catheterization lab

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: Upon admission to the catheterization lab"

(Codes: 385644000 |Requested (qualifier value)| 42525009 |Partial thromboplastin time, activated (procedure)|)

☐

◎ prompt: Time for lab draw?

response: Timestamp (Single)

◎ aPTT at specified time

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: timeForLabDraw , timing.upperBound: timeForLabDraw , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE"

(Codes: 385644000 |Requested (qualifier value)| 42525009 |Partial thromboplastin time, activated (procedure)|)

IF patient is FEMALE AND < 52 years old AND has NOT had a hyterectomy, bilateral oophorectomy, or tubal ligation OR is NOT in menopause OR has NOT been previously designated as medically unable to conceive by their provider

☐ Human chorionic gonadotropin (HCG)

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 67900009 |Human chorionic gonadotropin measurement (procedure)|)

Point-of-Care test

☐ Finger-stick Glucose

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 302789003 | Capillary blood glucose measurement (procedure)|)

Chapter 5. Imaging and Diagnostic Testing

Choose all that apply to patient

☐ 12-Lead ECG preprocedural evaluation for cardiac catheterization

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| [268400002 | 12 lead electrocardiogram (procedure)] ->(363702006 |Has focus (attribute))-[dffc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure)))

☐ Echocardiogram preprocedural evaluation for cardiac catheterization

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| [40701008 | Echocardiography (procedure)] ->(363702006 |Has focus (attribute))-[dffc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure)))

☐ X-ray chest posterioranterior (PA) and lateral preprocedural evaluation for cardiac catheterization

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| [42869005 | Diagnostic radiography of chest, combined posteroanterior and lateral (procedure)] ->(363702006 |Has focus (attribute))-[dffc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure)))

☐ X-ray anteroposterior (AP) portable preprocedural evaluation for cardiac catheterization

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

> "statementType:Precoordinated Expression topic:Postcoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| [394421000119103 |Plain x-ray of chest anteroposterior view (procedure)] ->(424226004 |Using device (attribute))->[706348008 |Radiology mobile medical facility (physical object)] ->(363702006 |Has focus (attribute))-[dffc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure)))

Chapter 6. Tabular List

Terminology Service Request (TSR) Mappings

Table 6.1. Terminology Versions

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

Table 6.2. Terminology References

System	Code	Display Text	References
SNOMED CT	105000003 |Troponin measurement (procedure)|	Precoordinated Expression	4
SNOMED CT	133936004 |Adult (person)|	Adult patients with suspected cardiac disease requiring invasive diagnosis and/or treatment	1
SNOMED CT	1411000205104 |Comprehensive metabolic panel (procedure	Precoordinated Expression	2
SNOMED CT	1411000205104 |Comprehensive metabolic panel (procedure)	Precoordinated Expression	2
SNOMED CT	258684004 |milligram (qualifier value)|	Precoordinated Expression	2
SNOMED CT	26604007 |Complete blood count (procedure)|	Postcoordinated Expression	4
SNOMED CT	302789003 |Capillary blood glucose measurement (procedure)|	Postcoordinated Expression	1
SNOMED CT	38151008 |Magnesium measurement (procedure)|	Postcoordinated Expression	4
SNOMED CT	385644000 |Requested (qualifier value)|	Precoordinated Expression	46
SNOMED CT	390917008 |Brain natriuretic peptide measurement (procedure)|	Precoordinated Expression	4
SNOMED CT	421026006 |Oral tablet (qualifier value)|	Precoordinated Expression	5
SNOMED CT	42525009 |Partial thromboplastin time, activated (procedure)|	Precoordinated Expression	4
SNOMED CT	440685005 |Calculation of international normalized ratio (procedure)|	Precoordinated Expression	4

System	Code	Display Text	References
SNOMED CT	67900009 |Human chorionic gonadotropin measurement (procedure)|	Precoordinated Expression	1
SNOMED CT	[182837001 |Restart of medication (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;6809 metFORMIN];	Postcoordinated Expression	1
SNOMED CT	[268400002 |12 lead electrocardiogram (procedure)] ->(363702006 | Has focus (attribute))-[df-fc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure))	Postcoordinated Expression	1
SNOMED CT	[304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[372862008 |Anticoagulant (substance)];	Postcoordinated Expression	1
SNOMED CT	[304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[67866001 |Insulin (substance)];	Postcoordinated Expression	1
SNOMED CT	[304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (at-	Postcoordinated Expression	1

System	Code	Display Text	References
	tribute))->[Rx;1191 Aspirin];		
SNOMED CT	[304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;6809 met-FORMIN];	Postcoordinated Expression	1
SNOMED CT	[394421000119103	Plain x-ray of chest anteroposterior view (procedure)] ->(424226004 |Using device (attribute))->[706348008	Radiology mobile medical facility (physical object)] ->(363702006 |Has focus (attribute))-[df-fc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure))	Postcoordinated Expression	1
SNOMED CT	[40701008 |Echocardiography (procedure)] ->(363702006 |Has focus (attribute))-[df-fc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure))	Postcoordinated Expression	1
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004	Direct substance (attribute))->[Rx;1085945 diphenhydrAMINE Hydrochloride 50 MG Oral Tablet] ->(410675002	Route of administration (attribute))->[260548002	Oral (qualifier value)]	Postcoordinated Expression	1

System	Code	Display Text	References
SNOMED CT	[416118004 |Adminis-tration (procedure)] ->(260686004 |Method (at-tribute))->[129445006 |Administration - ac-tion (qualifier val-ue)] ->(363701004	Direct substance (at-tribute))->[Rx;1158446 diphenhydrAMINE Injectable Product] ->(410675002 |Route of administration (at-tribute))->[255560000 |In-travenous (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 |Adminis-tration (procedure)] ->(260686004 |Method (at-tribute))->[129445006 |Administration - ac-tion (qualifier val-ue)] ->(363701004	Direct substance (at-tribute))->[Rx;1164003 Hydrocortisone Injectable Product] ->(410675002	Route of administration (attribute))->[255560000	Intravenous (qualifier val-ue)]	Postcoordinated Expression	1
SNOMED CT	[416118004 |Adminis-tration (procedure)] ->(260686004 |Method (at-tribute))->[129445006 |Administration - ac-tion (qualifier val-ue)] ->(363701004	Direct substance (at-tribute))->[Rx;197506 Cimetidine 300 MG Oral Tablet] ->(410675002	Route of administration (attribute))->[260548002	Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004	Adminis-tration (procedure)] ->(260686004	Method (at-tribute))->[129445006	Administration - ac-tion (qualifier val-ue)] ->(363701004		Postcoordinated Expression	3

System	Code	Display Text	References
	Direct substance (attribute))->[Rx;198148 predniSONE 50 MG Oral Tablet] ->(410675002 | Route of administration (attribute))->[260548002 | Oral (qualifier value)]		
SNOMED CT	[42869005 |Diagnostic radiography of chest, combined posteroanterior and lateral (procedure)] ->(363702006 | Has focus (attribute))-[df-fc9bef-d9a5-4b99-bf6a-a89511bf5410 |Evaluation of preoperative cardiac function (procedure))	Postcoordinated Expression	1

Chapter 7. Behavior Symbols

Table 7.1. Group Organizational Behavior

Symbol	Name	Definition
▸	Sentence Group	A group of related alternative actions is a sentence group if the item referenced by the action is the same in all the actions, and each action simply constitutes a different variation on how to specify the details for that item. For example, two actions that could be in a SentenceGroup are "aspirin, 500 mg, 2 times per day" and "aspirin, 300 mg, 3 times per day". In both cases, aspirin is the item referenced by the action, and the two actions represent two different options for how aspirin might be ordered for the patient. Note that a SentenceGroup would almost always have an associated selection behavior of "AtMostOne", unless it's a required action, in which case, it would be "ExactlyOne".
▷	Logical Group	A group with this behavior logically groups its sub-elements, and may be shown as a visual group to the end user, but it is not required to do so.
➤	Visual Group	Any group marked with this behavior should be displayed as a visual group to the end user.

Table 7.2. Group Selection Behavior

Symbol	Name	Definition
□	Any	Any number of the items in the group may be chosen, from zero to all.
⊙	All	All the items in the group must be selected as a single unit.
◎	AllOrNone	All the items in the group are meant to be chosen as a single unit: either all must be selected by the end user, or none may be selected.
○	ExactlyOne	The end user must choose one and only one of the selectable items in the group. The user may not choose none of the items in the group.
✪	AtMostOne	The end user may choose zero or at most one of the items in the group.
☀	OneOrMore	The end user must choose a minimum of one, and as many additional as desired.

Table 7.3. Required Behavior

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

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

Table 7.4. Precheck Behavior

Symbol	Name	Definition
▲	Yes	An action with this behavior is one of the most frequent actions that is, or should be, included by an end user, for the particular context in which the action occurs. The system displaying the action to the end user should consider "pre-checking" such an action as a convenience for the user.
▽	No	An action with this behavior is one of the less frequent actions included by the end user, for the particular context in which the action occurs. The system displaying the actions to the end user would typically not "pre-check" such an action.

Table 7.5. Cardinality Behavior

Symbol	Name	Definition
◆	Single	An action with this behavior may only be completed once.
❖	Multiple	An action with this behavior may be repeated multiple times.

Table 7.6. Item Flags

Symbol	Name	Definition
☞	fillIn	This item, in a list entry, allows the user to enter a fill in value that is not present in the set of presented choices.

Table 7.7. Read Only Behavior

Symbol	Name	Definition
☆	true	For a particular action or action group, specifies whether the elements are read only.

Appendix A. References

This appendix contains the list of related resources and supporting documents used in creating this KNART.

List of References

Related Resources

[CCWP] *Cardiology: Cardiac Catheterization, Pre-Cardiac Catheterization, and Post Catheterization Clinical Content White Paper*

[CSD] *Cardiology: Pre-Cardiac Catheterization Order Set Conceptual Structure Document*

[KVRpt] *Cardiology: Pre-Cardiac Catheterization Order Set KNART Validation Report*

Supporting Evidence

[Greenberger 1991] *Greenberger PA, Patterson R. The prevention of immediate generalized reactions to radiocontrast media in high-risk patients. J Allergy Clin Immunol. 1991;87(4):867-872* (link [Journal of Clinical Immunology 1991])

[Maddox 2014] *Maddox TM, Plomondon ME, Petrich M, et al. A national clinical quality program for Veterans Affairs catheterization laboratories (from the Veterans Affairs clinical assessment, reporting, and tracking program). Am J Cardiol. 2014;114(11):1750-1757* (link [https://doi.org/10.1016/j.amjcard.2014.08.045])

[Patel 2012] *Patel MR, Bailey SR, Bonow RO, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization. Cathet Cardiovasc Intervent. 2012;80(3):E50-E81* (link [https://doi.org/10.1016/j.jtcvs.2012.04.013])

[Dolgen Corp] *U.S. National Library of Medicine. ASPIRIN 81 MG (aspirin) tablet, coated [DOLGENCORP, LLC]. Revised January 2017* (link [http://dailymed.nlm.nih.gov/dailymed/lookup.cfm?setid=b4064039-2345-4227-b83d-54dc13a838d3])

[AstraZeneca] *U.S. National Library of Medicine. BRILINTA- ticagrelor tablet [AstraZeneca Pharmaceuticals LP]. Revised April 2017* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f7b3f443-e83d-4bf2-0e96-023448fed9a8.])

[Apotex] *U.S. National Library of Medicine. CLOPIDOGREL- clopidogrel bisulfate tablet, film coated [Apotex Corp.]. Revised November 2016* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=edae8d-f1-caf9-ff72-1304-5ae8b355f8e7])

[Upjohn and Company] *U.S. National Library of Medicine. DELTASONE- prednisone tablet [Pharmacia and Upjohn and Company]. Revised March 2007* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=3400d26a-41cb-40e4-99b4-780e1e0ec561])

[Sam's West Inc] *U.S. National Library of Medicine. DIPHENHYDRAMINE- diphenhydramine hcl tablet, coated [Sam's West Inc]. Revised June 2016* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=70a584ab-9e24-404a-aad7-f9a05c377248])

[APP Pharmaceuticals] *U.S. National Library of Medicine. DIPHENHYDRAMINE- diphenhydramine hydrochloride injection, solution [APP Pharmaceuticals, LLC]. Revised January 2012* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=fc574e74-1fdc-4a61-a1ed-492ae43faed2])

[Eli Lilly and Company] *U.S. National Library of Medicine. EFFIENT- prasugrel hydrochloride tablet, film coated [Eli Lilly and Company]. Revised July 2016* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=5fe9c118-c44b-48d7-a142-9668ae3df0c6])

[Pharmacia and Upjohn Company] *U.S. National Library of Medicine. SOLU-CORTEF- hydrocortisone sodium succinate injection, powder, for solution [Pharmacia and Upjohn Company LLC]. Revised October 2016* (link [https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=65eefd58-b166-4d71-ade6-45c8fdf86922])

[Valgimigli 2015] *Valgimigli M, Gagnor A, Calabró P, et al. Radial versus femoral access in patients with acute coronary syndromes undergoing invasive management: a randomised multicentre trial. Lancet. 2015;385(9986):2465-2476* (link [https://doi.org/10.1016/j.amjcard.2014.08.045])