Cardiology: Post-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)

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

Publication date 04/25/2018

Version: 1.0

Cardiology: Post-Cardiac Catheterization 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 04/25/2018

Table of Contents

List of Tables

Preface

Table 1. Revision History

Date	Life Cycle Event
April 25, 2018	Published
April 25, 2018	Reviewed
April 3, 2018	Reviewed
August 29, 2017	Pre-published
August 10, 2017	Created

Table 2. Clinical White Paper Contributors

Name	Role	Affiliation
Bruce Bray, MD	Author	Professor, Cardiovascular Medicine, University of Utah School of Medicine; Staff Cardiologist, Salt Lake City VA Medical Center (VAMC), 500 Foothill Drive, Salt Lake City, Utah 84148
Scott Wall, MD	Author	Assistant Professor, Cardiovascular Medicine, University of Utah; School of Medicine Staff Cardiologist, Electrophysiology, Salt Lake City VAMC, 500 Foothill Drive, Salt Lake City, Utah 84148
Aiden Abidov, MD PhD	Author	Professor of Medicine, Wayne State University; Section Chief, Cardiology, John Dingell VAMC

Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	04436c8e-e526-55e7-bb12-814c6b08a0d3	O19

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 invavise 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. Post-Cath Patient Placement

Admit patient to:

○ Intensive Care Unit (ICU)

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 305351004 |Admission to intensive care unit (procedure)|)

○ Telemetry Unit

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 1071000205100 |Admission to telemetry department (procedure))

○ Medical-Surgical Unit

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 305408004 |Admission to surgical department (procedure)|)

○ Other destination

◉ unit?

> prompt: Unit
>
> response: String (Single)
>
> ◉ prompt: Specify details
>
> response: String (Single)

Chapter 4. Vital Signs and Monitoring

Select all that apply

	☐ Vital Signs every 4 hours
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 4 , repetition.eventFrequency.upperBound: 4 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 61746007 |Taking patient vital signs (procedure)| 258702006 |hour (qualifier value)|)
	☐ Vital signs every 15 minutes times four, then every 30 minutes times four, then every 60 minutes for duration of bed rest
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.periodStart.upperBound: 60 , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.includeUpperBound: TRUE , repetition.periodDuration.lowerBound: 60 , repetition.periodDuration.upperBound: 60 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: TRUE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 15 , repetition.eventFrequency.upperBound: 15 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 15 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 61746007 |Taking patient vital signs (procedure)| 258701004 |min (qualifier value)| 258701004 |min (qualifier value)|)
	☐ Telemetry Monitoring
	☐ prompt: Specify details
	response: String (Single)
	☐ Telemetry Monitoring
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 422952004 |Cardiac telemetry (regime/therapy)|)

Chapter 5. Activity and Hemostasis Post Cardiac Catheterization

For patient who is status post catheterization via radial artery: Select all that apply

☐	Transradial hemostasis band
	Represented Concepts: [51241000 |Control of hemorrhage (procedure)] ->(424226004 |Using device (attribute))->[c7179507-4a60-4fe0-b412-4b31320d4787 |Transradial hemostasis band, device (physical object)]

◎ prompt: Specify START times for transradial band

response: Timestamp (Single)

responseBinding: Property ("startTime")

◎ prompt: Specify STOP times for transradial band

response: Timestamp (Single)

responseBinding: Property ("stopTime")

◎ Transradial hemostasis band as specified

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , repetition.periodStart.upperBound: startTime , repetition.periodStart.upperBound: stopTime , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.includeUpperBound: TRUE"

(Codes: 385644000 |Requested (qualifier value)| [51241000 |Control of hemorrhage (procedure)] ->(424226004 |Using device (attribute))->[c7179507-4a60-4fe0-b412-4b31320d4787 |Transradial hemostasis band, device (physical object)])

For patient who is status post catheterization via femoral artery: Select all that apply

	Arterial closure device

◎ Arterial closure device per local policy

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [410619003 |Application (procedure)] ->(424226004 |Using device (attribute))->[3e6b54c1-c13c-4684-ac69-e81bd4b0d1e9 |Vascular closure device (physical object)])

◎	Device information and instructions

◎ prompt: Specify device type utilized

response: String (Single)

◎ prompt: Specify inflation pressure

response: Integer (Single)

◎ prompt: Specify duration

response: String (Single)

◎ prompt: Observations

response: String (Single)

Bed rest

☐

◎ prompt: Hours of bed rest

response: Integer (Single)

responseBinding: Property ("bedRestHours")

◎ Bed rest per local policy

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.periodStart.upperBound: 1 , repetition.periodStart.upperBound: bedRestHours , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.includeUpperBound: FALSE , repetition.periodStart.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 225316001 |Bedrest (regime/therapy)| 258702006 |hour (qualifier value)|)

☐ Maintain straight leg on the catheter site side during bed rest

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| b4ae-b053-3ced-4c16-8a36-f6db564bcc47 |Recommendation to maintain straight leg (procedure))

☐ Log roll side-to-side during bed rest as needed

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 398213004 |Log roll (procedure)|)

☐ Elevate head of bed 30 degrees 2 hours after procedure

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

"statementType:Precoordinated Expression topic:Precoordinated Expression , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , repetition.periodStart.upperBound: 1 , requestedResult.lowerBound: 30 , requestedResult.upperBound: 30 , requestedResult.includeLowerBound: TRUE , requestedResult.includeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 423171007 |Elevation of head of bed (procedure)| 277255000 |Angular degrees (qualifier value)|)

Chapter 6. Nursing Care

Nursing Care Orders

☐ Check access site every 15 minutes times four, then every 30 minutes times four, then every 60 minutes for duration of bed rest routine

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.periodStart.upperBound: , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.includeUpperBound: TRUE , repetition.periodDuration.lowerBound: 60 , repetition.periodDuration.upperBound: 60 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: TRUE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 15 , repetition.eventFrequency.upperBound: 15 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 15 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

> (Codes: 385644000 |Requested (qualifier value)| 444713005 |Assessment of catheter entry site (procedure)| 258701004 |min (qualifier value)| 258701004 |min (qualifier value)|)

☐ Check distal pulses every 15 minutes times four, then every 30 minutes times four, then every 60 minutes for duration of bed rest routine

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.periodStart.upperBound: , repetition.periodStart.includeLowerBound: TRUE , repetition.periodStart.includeUpperBound: TRUE , repetition.periodDuration.lowerBound: 60 , repetition.periodDuration.upperBound: 60 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: TRUE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 15 , repetition.eventFrequency.upperBound: 15 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 15 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

> (Codes: 385644000 |Requested (qualifier value)| 424411004 |Peripheral pulse taking (procedure)| 258701004 |min (qualifier value)| 258701004 |min (qualifier value)|)

Chapter 7. Medications

Select all that apply

Aspirin	
☐ Aspirin 81 mg tablet orally every day	
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
	"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 1 , timing.upperBound: 1 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.periodDuration.lowerBound: 1 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: FALSE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 1 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;243670 Aspirin 81 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 258703001 |day (qualifier value)| 258703001 |day (qualifier value)|)
Clopidogrel	
☐	⊛ Clopidogrel 300 tablet orally, 1 time loading dose in catheterization lab
	actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]
	"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 1 , timing.upperBound: 1 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.measureSemantic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (at-

tribute))->[Rx;749196 clopidogrel 300 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 246432004 |Number of occurrences (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

◎ prompt: Details

response: String (Single)

☐

◎ prompt: Please provide start time

response: Timestamp (Single)

◎ Clopidogrel 600 tablet orally, 1 time loading dose in catheterization lab

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 2 , timing.upperBound: 2 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;749196 clopidogrel 300 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 246432004 |Number of occurrences (qualifier value)|)

◎ prompt: Details

response: String (Single)

☐

◎ Clopidogrel 75 mg tablet orally every day beginning 1 day after loading dose

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lower-

Bound: 2 , timing.upperBound: 2 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.periodDuration.lowerBound: 1 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: FALSE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 1 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;309362 clopidogrel 75 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 258703001 |day (qualifier value)| 258703001 | day (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

Prasugrel

◎ Prasugrel 60 mg tablet orally, 1 time loading dose in catheterization lab

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 6 , timing.upperBound: 6 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;855812 prasugrel 10 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 246432004 | Number of occurrences (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

◎ prompt: Details

response: String (Single)

◎ Prasugrel 10 mg tablet orally every day beginning 1 day after loading dose

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 1 , timing.upperBound: 1 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.periodDuration.lowerBound: 1 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: FALSE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 1 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;855812 prasugrel 10 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 258703001 | day (qualifier value)| 258703001 |day (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

Ticagrelor

◎ Ticagrelor 180 mg tablet orally, 1 time loading dose in catheterization lab

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 2 , timing.upperBound: 2 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1116633 Ticagrelor 90 MG] ->(410675002 | Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 246432004 |Number of occurrences (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

◎ prompt: Details

response: String (Single)

◎ Ticagrelor 90 mg tablet orally, 2 times a day beginning 1 day after loading dose

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression , timing.lowerBound: 1 , timing.upperBound: 1 , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , requestedResult.measureSemantic:Precoordinated Expression , repetition.periodDuration.lowerBound: 1 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: FALSE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 2 , repetition.eventFrequency.upperBound: 2 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 1 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;1116633 Ticagrelor 90 MG] ->(410675002 | Route of administration (attribute))->[260548002 |Oral (qualifier value)] 421026006 |Oral tablet (qualifier value)| 258703001 |day (qualifier value)| 258703001 |day (qualifier value)|)

◎ prompt: Please provide start time

response: Timestamp (Single)

Chapter 8. Laboratory Tests

☐ Comprehensive Metabolic Panel now

☐ Complete blood count (CBC) now and in 8 hours; if hemoglobin decrease >2 g/dl with the second CBC or any subsequent CBC, repeat the CBC in 8 hours again

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , unstructured[0]: if hemoglobin decrease less than 2 g/dl with the second CBC or any subsequent CBC, repeat the CBC in 8 hours again , timing.lowerBound: , timing.upperBound: , timing.includeLowerBound: TRUE , timing.inludeUpperBound: TRUE , timing.resolution:"
>
> (Codes: 385644000 |Requested (qualifier value)| 1411000205104 |Comprehensive metabolic panel (procedure))

☐ Complete blood count daily

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression , repetition.periodDuration.lowerBound: 1 , repetition.periodDuration.includeLowerBound: TRUE , repetition.periodDuration.inludeUpperBound: FALSE , repetition.periodDuration.measureSemantic:Precoordinated Expression , repetition.eventFrequency.lowerBound: 1 , repetition.eventFrequency.upperBound: 1 , repetition.eventFrequency.includeLowerBound: TRUE , repetition.eventFrequency.inludeUpperBound: TRUE , repetition.eventFrequency.resolution: 1 , repetition.eventFrequency.measureSemantic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 26604007 |Complete blood count (procedure)| 258703001 |day (qualifier value)| 258703001 |day (qualifier value)|)

☐ Brain natriuretic peptide now

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 390917008 |Brain natriuretic peptide measurement (procedure)|)

☐ Troponin now

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

> "statementType:Precoordinated Expression topic:Precoordinated Expression"
>
> (Codes: 385644000 |Requested (qualifier value)| 105000003 |Troponin measurement (procedure)|)

☐ Magnesium now

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

	"statementType:Precoordinated Expression topic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 38151008 | Magnesium measurement (procedure)|)
☐ INR now	
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)|)
☐ aPTT now	
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
	"statementType:Precoordinated Expression topic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 42525009 | Partial thromboplastin time, activated (procedure)|)
☐ Fingerstick glucose now	
actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]	
	"statementType:Precoordinated Expression topic:Precoordinated Expression"
	(Codes: 385644000 |Requested (qualifier value)| 302789003 | Capillary blood glucose measurement (procedure)|)

Chapter 9. Imaging and Diagnostic Testing

Choose all that apply to patient

☐ 12-lead ECG postprocedural evaluation following cardiac catheterization

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 268400002 |12 lead electrocardiogram (procedure)|)

☐ 12-lead ECG as needed for chest pain

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

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

(Codes: 385644000 |Requested (qualifier value)| 268400002 |12 lead electrocardiogram (procedure)| [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[29857009 |Chest pain (finding)])

☐ Echocardiogram and additional parameters

◉ Echocardiogram postprocedural evaluation following 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))->[370800005 |Evaluation of postoperative cardiac function (procedure)])

◉ prompt: Additional parameters?

response: String (Single)

☐ X-ray chest PA and lateral postprocedural evaluation following 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))->[370800005 |Evaluation of postoperative cardiac function (procedure)])

☐ X-ray chest AP portable postprocedural evaluation following 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))->[370800005 |Evaluation of postoperative cardiac function (procedure)])

Chapter 10. Tabular List

Terminology Service Request (TSR) Mappings

Table 10.1. 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 10.2. Terminology References

System	Code	Display Text	References
SNOMED CT	105000003 |Troponin measurement (procedure)|	Precoordinated Expression	1
SNOMED CT	1071000205100 |Admission to telemetry department (procedure)	Precoordinated Expression	1
SNOMED CT	133936004 |Adult (person)|	Adult patients with suspected cardiac disease requiring invavise diagnosis and/or treatment	1
SNOMED CT	1411000205104 |Comprehensive metabolic panel (procedure)	Precoordinated Expression	1
SNOMED CT	225316001 |Bedrest (regime/therapy)|	Precoordinated Expression	1
SNOMED CT	246432004 |Number of occurrences (qualifier value)|	Precoordinated Expression	4
SNOMED CT	258701004 |min (qualifier value)|	Precoordinated Expression	6
SNOMED CT	258702006 |hour (qualifier value)|	Precoordinated Expression	2
SNOMED CT	258703001 |day (qualifier value)|	Precoordinated Expression	10
SNOMED CT	26604007 |Complete blood count (procedure)|	Precoordinated Expression	1
SNOMED CT	268400002 |12 lead electrocardiogram (procedure)|	Precoordinated Expression	2
SNOMED CT	277255000 |Angular degrees (qualifier value)|	Precoordinated Expression	1
SNOMED CT	302789003 |Capillary blood glucose measurement (procedure)|	Precoordinated Expression	1
SNOMED CT	305351004 |Admission to intensive care unit (procedure)|	Precoordinated Expression	1

System	Code	Display Text	References
SNOMED CT	305408004 |Admission to surgical department (procedure)|	Precoordinated Expression	1
SNOMED CT	38151008 |Magnesium measurement (procedure)|	Precoordinated Expression	1
SNOMED CT	385644000 |Requested (qualifier value)|	Precoordinated Expression	35
SNOMED CT	390917008 |Brain natriuretic peptide measurement (procedure)|	Precoordinated Expression	1
SNOMED CT	398213004 |Log roll (procedure)|	Precoordinated Expression	1
SNOMED CT	421026006 |Oral tablet (qualifier value)|	Precoordinated Expression	8
SNOMED CT	422952004 |Cardiac telemetry (regime/therapy)|	Precoordinated Expression	1
SNOMED CT	423171007 |Elevation of head of bed (procedure)|	Precoordinated Expression	1
SNOMED CT	424411004 |Peripheral pulse taking (procedure)|	Precoordinated Expression	1
SNOMED CT	42525009 |Partial thromboplastin time, activated (procedure)|	Precoordinated Expression	1
SNOMED CT	440685005 |Calculation of international normalized ratio (procedure)|	Precoordinated Expression	1
SNOMED CT	444713005 |Assessment of catheter entry site (procedure)|	Precoordinated Expression	1
SNOMED CT	61746007 |Taking patient vital signs (procedure)|	Precoordinated Expression	2
SNOMED CT	[386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[29857009 |Chest pain (finding)]	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))->[370800005 |Evaluation of postopera-	Postcoordinated Expression	1

System	Code	Display Text	References
	tive cardiac function (procedure)]		
SNOMED CT	[40701008 |Echocardiography (procedure)] ->(363702006 |Has focus (attribute))->[370800005 |Evaluation of postoperative cardiac function (procedure)]	Postcoordinated Expression	1
SNOMED CT	[410619003 |Application (procedure)] ->(424226004 |Using device (attribute))->[3e6b54c1-c13c-4684-ac69-e81b-d4b0d1e9 |Vascular closure device (physical object)]	Postcoordinated Expression	1
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004	Direct substance (attribute))->[Rx;1116633 Ticagrelor 90 MG] ->(410675002 |Route of administration (attribute))->[260548002	Oral (qualifier value)]	Postcoordinated Expression	2
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004	Direct substance (attribute))->[Rx;243670 Aspirin 81 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002	Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - ac-	Postcoordinated Expression	1

System	Code	Display Text	References
	tion (qualifier value)] ->(363701004 | Direct substance (attribute))->[Rx;309362 clopidogrel 75 MG Oral Tablet] ->(410675002 | Route of administration (attribute))->[260548002 | Oral (qualifier value)]		
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 | Direct substance (attribute))->[Rx;749196 clopidogrel 300 MG Oral Tablet] ->(410675002 | Route of administration (attribute))->[260548002 | Oral (qualifier value)]	Postcoordinated Expression	2
SNOMED CT	[416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 | Direct substance (attribute))->[Rx;855812 prasugrel 10 MG Oral Tablet] ->(410675002 | Route of administration (attribute))->[260548002 | Oral (qualifier value)]	Postcoordinated Expression	2
SNOMED CT	[42869005 |Diagnostic radiography of chest, combined posteroanterior and lateral (procedure)] ->(363702006 |Has focus (attribute))->[370800005 |Evaluation of postoperative cardiac function (procedure)]	Postcoordinated Expression	1
SNOMED CT	[51241000 |Control of hemorrhage (procedure)] ->(424226004 |Using device (attribute))->[c7179507-4a60-4fe0-	Postcoordinated Expression	2

System	Code	Display Text	References
	b412-4b31320d4787 |Transradial hemostasis band, device (physical object)]		
SNOMED CT	b4ae-b053-3ced-4c16-8a36-f6d-b564bcc47 |Recommendation to maintain straight leg (procedure)	Precoordinated Expression	1

Chapter 11. Behavior Symbols

Table 11.1. 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 11.2. 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 11.3. 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 11.4. 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 11.5. 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 11.6. 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 11.7. 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: Post-Cardiac Catheterization Order Set Conceptual Structure Document*

[KVRpt] *Cardiology: Post-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/SC-CT/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])