

Clinical Decision Support (CDS) Content and Health Level 7 (HL7)- Compliant Knowledge Artifacts (KNARTs)

Cardiology: Cardiac Catheterization, Pre- Cardiac Catheterization, and Post Catheterization Clinical Content White Paper

Department of Veterans Affairs (VA)



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

Clinical Decision Support (CDS) Content and Health Level 7 (HL7)-Compliant Knowledge Artifacts (KNARTs): Cardiology: Cardiac Catheterization, Pre-Cardiac Catheterization, and Post Catheterization Clinical Content White Paper

by Department of Veterans Affairs (VA)

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Table 1. Relevant KNART Information: Cardiology: Cardiac Catheterization, Pre-Cardiac Catheterization, and Post Catheterization

Cardiology KNARTs	Associated CLIN
Cardiac Catheterization - Documentation Template	CLIN0009BA
Pre-Cardiac Catheterization - Order Set	CLIN0008BA
Post Cardiac Catheterization - Order Set	CLIN0008BA

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Introduction

The VA is committed to improving the ability of clinicians to provide care for patients while increasing quality, safety, and efficiency. Recognizing the importance of standardizing clinical knowledge in support of this goal, VA is implementing the Health Level 7 (HL7) Knowledge Artifact Specification for a wide range of VA clinical use cases. Knowledge Artifacts, referred to as (KNARTs), enable the structuring and encoding of clinical knowledge so the knowledge can be integrated with electronic health records to enable clinical decision support.

The purpose of this Clinical Content White Paper (CCWP) is to capture the clinical context and intent of KNART use cases in sufficient detail to provide the KNART authoring team with the clinical source material to construct the corresponding knowledge artifacts using the HL7 Knowledge Artifact Specification. This paper has been developed using material from a variety of sources: VA artifacts, clinical practice guidelines, evidence in the body of medical literature, and clinical expertise. After reviewing these sources, the material has been synthesized and harmonized under the guidance of VA subject matter experts to reflect clinical intent for this use case.

Unless otherwise noted, items within this white paper (e.g., documentation template fields, orderable items, etc.) are chosen to reflect the clinical intent at the time of creation. To provide an exhaustive list of all possible items and their variations is beyond the scope of this work.

Conventions Used

Conventions used within the knowledge artifact descriptions include:

<obtain>: Indicates a prompt to obtain the information listed

- If possible, the requested information should be obtained from the underlying system(s). Otherwise, prompting the user for information may be required
- Default Values: Unless otherwise noted, <obtain> indicates to obtain the most recent observation. It is recognized that this default time-frame value may be altered by future implementations

[...]: Square brackets enclose explanatory text that indicates some action on the part of the clinical user, or general guidance to the clinical or technical teams. Examples include, but are not limited to:

[Begin ...], [End ...]: Indicates the start and end of specific areas to clearly delineate them for technical purposes.

[Activate ...]: Initiates another knowledge artifact or knowledge artifact section.

[Section Prompt: ...]: If this section is applicable, then the following prompt should be displayed to the user.

[Section Selection Behavior: ...]: Indicates technical constraints or considerations for the selection of items within the section.

[Attach: ...]: Indicates that the specified item should be attached to the documentation template if available.

[Link: ...]: Indicates that rather than attaching an item, a link should be included in the documentation template.

[Clinical Comment: ...]: Indicates clinical rationale or guidance.

[Technical Note: ...]: Indicates technical considerations or notes.

[If ...]: Indicates the beginning of a conditional section.

[Else, ...]: Indicates the beginning of the alternative branch of a conditional section.

[End if ...]: Indicates the end of a conditional section.

☐ [Check box]: Indicates items that should be selected based upon the section selection behavior.

Chapter 1. Cardiology: Cardiac Catheterization, Pre-Cardiac Catheterization and Post Cardiac Catheterization

1. Clinical Context

[Begin Clinical Context.]

The Cardiology Cardiac Catheterization KNART is intended for clinical providers caring for adult patients in a Cardiology Clinic who are undergoing cardiac catheterization. The documentation template is intended to ensure that appropriate data elements are captured prior to and immediately following cardiac catheterization, and the order sets are intended to provide common orderable items for pre- and post-catheterization care. Specific constraints for these artifacts are that:

- They apply to outpatients undergoing an elective procedure
- They exclude patients with known Acute Coronary Syndrome (ACS)
- They exclude patients requiring emergency surgery

Table 1.1. Clinical Context Domains

Target User	Cardiologist
Patient	Adult Catheterization lab patients
Priority	Routine
Specialty	Invasive cardiology/Interventional
Location	Outpatient

[End Clinical Context.]

2. Knowledge Artifacts

[Begin Knowledge Artifacts.]

This section describes the CDS knowledge artifacts that are part of the Cardiology Cardiac Catheterization, Pre-Cardiac Catheterization and Post Cardiac Catheterization white paper which include:

- Documentation Template: Cardiology: Cardiac Catheterization KNART
 - Documents the information relevant to the catheterization procedure, prior to and immediately following performance of the procedure.
 - Includes logic for appropriate display of documentation sections
- Order Set: Cardiology: Pre-Cardiac Catheterization KNART
 - Orderable items for use prior to Cardiac Catheterization procedure
 - Includes logic for appropriate display of orderables
- Order Set: Cardiology: Post Cardiac Catheterization KNART

Cardiology: Cardiac Catheterization,
Pre-Cardiac Catheterization and Post
Cardiac Catheterization

- Orderable items for use following Cardiac Catheterization procedures
- Includes logic for appropriate display of orderables

[End Knowledge Artifacts.]

Chapter 2. Documentation Template: Cardiology: Cardiac Catheterization

[Begin Documentation Template: Cardiology: Cardiac Catheterization.]

1. Knowledge Narrative

[Begin Knowledge Narrative.]

[See Clinical Context in Chapter 1.]

Cardiac catheterization allows detailed evaluation of the heart's blood vessels, chambers, and valves. It can provide important diagnostic information that can be used to diagnose different types of heart disease and to guide treatment. However, it is also invasive and expensive. In 2012, the American College of Cardiology Foundation (ACCF) and the Society for Cardiovascular Angiography and Interventions (SCAI), in collaboration with other specialty and subspecialty societies, published appropriate use criteria for cardiac catheterization based on an extensive review of guidelines and relevant studies. The authors anticipated that the appropriate use criteria would facilitate decision-making and could impact reimbursement policies and health care delivery (Patel 2012). While rates of inappropriate cardiac catheterization within the VA are low in comparison with other institutions, significant interhospital variation still exists. A particularly important point with regard to patient safety is the controversy regarding the relative merits of radial versus femoral access for cardiac catheterization. Radial artery access appears to result in slightly fewer 30-day major adverse cardiovascular events than femoral access (Valgimigli 2015).

[Technical Note: Sections 2.2 through 2.8 should display only prior to cardiac catheterization performance, and section 2.9 should display only after cardiac catheterization performance. Please provide a user interface that enables selection of the appropriate section.]

[End Knowledge Narrative.]

2. Cardiac Catheterization Indications

[Begin Cardiac Catheterization Indications.]

[Technical Note: Add link to Patel 2012 reference: www.scai.org/asset.axd?id=d24adef2-40d4-4897-b665-ee6c2ebcb41f.]

[Section Prompt: Indications for cardiac catheterization.]

[Section Selection Behavior: Select all that apply. Optional.]

- ☐ Suspected A cute C oronary S yndrome
- ☐ Suspected C oronary A rtery D isease (C A D)
- ☐ S T-Segment Elevation M yocardial I nfarction
- ☐ F indings on S tress T est
 - ☐ H ighRisk Findings on E lectrocardiogram (E CG) S tress T est (e.g., Duke Treadmill Score \leq -11, Ventricular Tachycardia, Prolonged ST-Segment Depression, or Exercise-Induced Hypotension)
 - ☐ H ighRisk Findings on I maging S tress T est (e.g., $> 10\%$ Ischemic Myocardium on Nuclear Perfusion Imaging, Stress-Induced Wall Motion Abnormality in ≥ 2 Segments on Echocardiography, Transient Ischemic Dilation, or Stress-Induced Left Ventricular Dysfunction)
 - ☐ R esting L eft V entricu lar E jection F raction (L V E F) $\leq 40\%$ and V iable M yocardium in D ysfunctional Segment (Reversible Ischemia) on I maging S tress T est

☐ Sym ptom s

☐ Sym ptom atic Patient w ith H igh Pretest Probab ility of coronary artery disease and N o Prior N oninvasive Stress Imaging

☐ Sym ptom atic Patient w ith Interm ediate Risk Findings on Imaging Stress Test (5% to 10% Ischemic Myocardium on Nuclear Perfusion Imaging or Stress-Induced Wall Motion Abnormality in 1 Segment on Echocardiography)

☐ Sym ptom atic Patient w ith D iscordant or Equivocal/U ninterpretab le F indings on Im aging Stress Test

☐ Sym ptom atic Patient w ith New Left V entricular Systolic D ysfunction (LVEF \leq 40%) of Unknown Etiology on Transthoracic Echocardiography

☐ Sym ptom atic Patient w ith Suspected S ignificant Ischem ic Com plication of CAD on Transthoracic or Transesophageal Echocardiography (e.g., Mitral Regurgitation or Ventricular Septal Defect)

☐ Sym ptom atic Patient w ith A ny Lesion \geq 50% on Coronary Com puted Tom ography (CT) A ngiography

☐ Sym ptom atic Patient w ith Possib ly O bstructive Lesion of U nclear Severity on Coronary CT Angiography

☐ K now n CAD

☐ M edically M anaged Patient w ith L im iting or W orsening Symptoms and Noninvasive Findings of Intermediate Risk that have worsened

☐ M edically M anaged Patient and H igh Risk Noninvasive Findings

☐ Post revascularization [Percutaneous Coronary Intervention (PCI) or Coronary Artery Bypass Graft (CABG)] Patient with Limiting or Worsening Symptoms and Intermediate-Risk Noninvasive Findings

☐ Post revascularization Patient w ith L im iting or W orsening Sym ptom s and H igh Risk Noninvasive Findings

☐ Return of Spontaneous C irculation after Resuscitated C ardiac Arrest of U nclear Etiology

☐ V entricular F ibrillation or Sustained V entricu lar T achycardia of U nclear E tiology

☐ A ssessm ent of V alvular H eart D isease

☐ M itral V alve

☐ A ortic V alve

☐ T ricuspid V alve

☐ Pu lm onary V alve

☐ Pu lm onary H ypertension D isproportionate to Valvular Disease

☐ Left V entricu lar D ysfunction D isproportionate to V alvular D isease

☐ Conflict betw een F indings of N oninvasive Im aging for M itral or A ortic Stenosis or Regurg itation and Clinical Impression of Severity

☐ Suspected Pericard ial T amponade

☐ Suspected or U ncerta in Constrictive or Restrictive Pericard ial D isease

☐ Suspected or K now n Card iom yopathy

☐ Reevaluation of K now n Card iom yopathy to G uide Therapy or after C hange in C linical Status or Exam

<obtain> Additional Prior Indication Detail

[End Cardiac Catheterization Indications.]

3. Prior Cardiac Procedures

[Begin Prior Cardiac Procedures.]

[Section Prompt: Prior Cardiac Procedures.]

[Section Selection Behavior: Select all that apply. Optional.]

☐ Most Recent Angiography

<obtain> Date

<obtain> Findings

☐ Most Recent Percutaneous Coronary Intervention

<obtain> Date

<obtain> Findings

☐ Prior Cardiac Operative Report

<obtain> Date

<obtain> Findings

[Section Prompt: Additional Prior Cardiac Procedure?]

☐ Yes

<obtain> Additional Prior Cardiac Procedure Detail

<obtain> Date

<obtain> Findings

☐ No

[Technical Note: The clinical provider should have the ability to complete multiple instances of "Additional Prior Cardiac Procedure".]

[End Prior Cardiac Procedures.]

4. Plan

[Begin Plan.]

[Section Prompt: Planned Procedure]

☐ Left Heart Catheterization

☐ Coronary Angiography

☐ Left Ventriculography

☐ Right Heart Catheterization

☐ Pericardiocentesis

- ☐ Possible Percutaneous Coronary Intervention(Angioplasty/Stent)
- ☐ Endomyocardial Biopsy
- ☐ Other

<obtain> Other Procedure

[Section Prompt: Planned Access Site?]

- ☐ Left Femoral Vein
- ☐ Right Femoral Vein
- ☐ Left Radial Artery
- ☐ Right Radial Artery
- ☐ Left Internal Jugular Vein
- ☐ Right Internal Jugular Vein
- ☐ Left Subclavian Vein
- ☐ Right Subclavian Vein
- ☐ Other

<obtain> Other Site

[End Plan.]

5. Consent

[Begin Consent.]

- ☐ Consent Obtained

[End Consent.]

6. Special Considerations

[Begin Special Considerations.]

[Section Prompt: Special Considerations.]

[Section Prompt: Radiocontrast Allergy?]

- ☐ Yes
 - <obtain> History and Description of Reaction
- ☐ No

[Section Prompt: Diabetes?]

- ☐ Yes
 - ☐ Hold Insulin
 - <obtain> Details
 - ☐ Hold Metformin

<obtain> Details

☐ No

[Section Prompt: Anticoagulation?]

[Technical Note: Consider providing linkage to Heparin KNART in the future.]

☐ Yes

☐ Hold Anticoagulation Therapy

<obtain> Details

☐ No

[Section Prompt: Kidney Disease?]

☐ Yes

Stage

☐ Stage 1 (Glomerular Filtration Rate ≥ 90 mL/min per 1.73 m^2)

☐ Stage 2 (Glomerular Filtration Rate 60 to 89 mL/min per 1.73 m^2)

☐ Stage 3 (Glomerular Filtration Rate 30 to 59 mL/min per 1.73 m^2)

☐ Stage 4 (Glomerular Filtration Rate 15 to 29 mL/min per 1.73 m^2)

☐ Stage 5 (Glomerular Filtration Rate < 15 mL/min per 1.73 m^2 or on dialysis)

☐ No

[End Special Considerations.]

7. Laboratory Studies

[Begin Laboratory Studies.]

[Section Prompt: Laboratory Studies.]

<obtain> Comprehensive Metabolic Profile Result

<obtain> Complete Blood Count Result

<obtain> Brain Natriuretic Peptide Result

<obtain> Troponin Result

<obtain> Magnesium Result

<obtain> Activated Partial Thromboplastin Time (aPTT) Result

<obtain> Human Chorionic Gonadotropin Result

[Section Prompt: Point of Care Studies.]

<obtain> Fingerstick Glucose Result

[End Laboratory Studies.]

8. Imaging and Diagnostic Studies

[Begin Imaging and Diagnostic Studies.]

[Technical Note: Images should be attached automatically if text is provided for 12-lead ECG interpretation field]

<obtain> 12-Lead ECG Interpretation

[Technical Note: Attach: 12-Lead ECG Images.]

[Technical Note: Images should be attached automatically if text is provided for the X-Ray Chest Interpretation field]

<obtain> X-Ray Chest Interpretation

[Technical Note: Attach: X-Ray Chest images.]

[Technical Note: Images should be attached automatically if text is provided for the Echocardiogram Interpretation field]

<obtain> Echocardiogram Interpretation

[Technical Note: Attach: Echocardiogram images.]

[End Imaging and Diagnostic Studies.]

9. Brief Post Catheterization Note

[Begin Brief Post Catheterization Note.]

[Section Prompt: Brief Post Catheterization Note.]

[Technical Note: Include link to full VA Clinical Assessment Reporting and Tracking (CART) Program for cardiac catheterization laboratories (Cart-CL) Report.]

[Technical Note: Link to CART-CL Report.]

[Section Prompt: Procedure Performed.]

[Section Selection Behavior: Select all that apply. Optional.]

☐ Left Heart Catheterization

☐ Coronary Angiography

☐ Left Ventriculography

☐ Right Heart Catheterization

☐ Pericardiocentesis

☐ Other

<obtain> Other Procedure

[Section Prompt: Interventions.]

☐ Percutaneous Coronary Intervention

☐ Angioplasty

☐ Stent

☐ Endomyocardial Biopsy

☐ Other

<obtain> Other Intervention

[Section Prompt: Access Site.]

☐ Left Femoral Vein

☐ Right Femoral Vein

☐ Left Radial Artery

☐ Right Radial Artery

☐ Left Internal Jugular Vein

☐ Right Internal Jugular Vein

☐ Left Subclavian Vein

☐ Right Subclavian Vein

☐ Other

<obtain> Other Site

<obtain> Sheath Size (French)

<obtain> Findings

<obtain> Interventions Performed Details

<obtain> Complications

[Section Prompt: Automatic Closure Device Used?]

[Section Selection Behavior: Select one. Required.]

☐ Yes

☐ No

[End Brief Post Catheterization Note.]

[End Documentation Template: Cardiology: Cardiac Catheterization.]

Chapter 3. Order Set: Cardiology: Pre-Cardiac Catheterization

[Begin Order Set: Cardiology: Pre-Cardiac Catheterization.]

1. Knowledge Narrative

[Begin Knowledge Narrative.]

[See Clinical Context in Chapter 1.]

[End Knowledge Narrative.]

2. Medications

[Begin Medications.]

[Section Prompt: Order Pre-Cardiac Catheterization Medications.]

[Technical Note: Display both the "Oral Contrast Allergy Premedication Regimen" AND the "Intravenous Contrast Allergy Premedication Regimen" sections ONLY for those patients with documented contrast allergy of any kind.]

[Section Prompt: Oral Contrast Allergy Premedication Regimen.]

[Section Selection Behavior: Select any that apply. Optional.]

- ☐ Prednisone 50 m g tablet oral 1 time 13 hours before procedure
- ☐ Prednisone 50 m g tablet oral 1 time 7 hours before procedure
- ☐ Prednisone 50 m g tablet oral 1 time 1 hour before procedure
- ☐ Diphenhydramine 50 m g tablet oral 1 time 1 hour before procedure
- ☐ Cimetidine 300 m g tablet oral 1 time 1 hour before procedure

[Section Prompt: Intravenous Contrast Allergy Premedication Regimen.]

[Section Selection Behavior: Select any that apply. Optional.]

- ☐ Hydrocortisone 200 m g solution intravenous 1 time 4 hours before procedure
- ☐ Diphenhydramine 50 mg solution intravenous 1 time 4 hours before procedure

[Section Prompt: Hold Medication Orders.]

[Technical Note: Orders in this subsection should be made available as appropriate, based on either the patient's active medication list or selection of the corresponding "Hold..." checkboxes in the Special Considerations section of the Documentation Template: Cardiology: Cardiac Catheterization KNART.]

[Technical Note: The prescriber should be prompted to enter the timeframe in which the following medication should be resumed.]

[Section Selection Behavior: Select all that apply. Optional.]

[Section Prompt: This section applies to patients who are on medications which should be held prior to cardiac catheterization.]

☐ Hold insulin and resume as directed after cardiac catheterization routine

<obtain> Start and stop timing for insulin hold and resume

☐ Hold metformin and resume as directed after cardiac catheterization routine

<obtain> Start and stop timing for insulin hold and resume

☐ Hold anticoagulation therapy and resume as directed after cardiac catheterization routine

<obtain> Start and stop timing for insulin hold and resume

☐ Hold aspirin therapy and resume as directed after cardiac catheterization

<obtain> Start and stop timing for insulin hold and resume

[End Medications.]

3. Laboratory Tests

[Begin Laboratory Tests.]

[Section Prompt: Please select appropriate laboratory tests to be done prior to cardiac catheterization.]

[Section Selection Behavior: Select all that apply. Optional.]

☐ Comprehensive metabolic profile

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ Complete blood count

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ Brain natriuretic peptide

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ International normalized ratio (INR)

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ Troponin

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ Magnesium level

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

☐ aPTT

☐ Stat

☐ Today

☐ Upon admission to catheterization lab

☐ Other

<obtain> Timeframe for lab draw

[Section Prompt: Pregnancy Testing.]

[Technical Note: This subsection should display only if patient is female and medically able to conceive.]

[Section Prompt: Order the following study only for a female patient who is medically able to conceive, for example:

- Patient is at least 13 years of age but less than 52 years of age; and
- Patient is not postmenopausal; and
- Patient has not been diagnosed as unable to conceive, and
- Patient has not had any of the following:
 - Hysterectomy; or
 - Bilateral oophorectomy; or
 - Tubal ligation.

[Section Prompt: Point of Care Tests.]

☐ F ingerstick g lucose

[End Laboratory Tests.]

4. Imaging and Electrocardiogram (ECG)

[Begin Imaging and Electrocardiogram (ECG).]

[Section Selection Behavior: Select all that apply. Optional.]

☐ 12Lead ECG preprocedural evaluation for cardiac catheterization

☐ Echocard iogram preprocedural evaluation forcardiac catheterization

<obtain> Details

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

☐ Echocard iogram Anteroposterior (AP) portable preprocedural evaluation for cardiac catheterization

[End Imaging and Electrocardiogram (ECG).]

[End Order Set: Cardiology: Pre-Cardiac Catheterization.]

Chapter 4. Order Set: Cardiology: Post Cardiac Catheterization

[Begin Order Set: Cardiology: Post Cardiac Catheterization.]

1. Knowledge Narrative

[Begin Knowledge Narrative.]

[See Clinical Context in Chapter 1.]

[End Knowledge Narrative.]

2. Patient Admission

[Begin Patient Admission.]

[Section Prompt: Admit to:]

☐ Intensive Care Unit (ICU)

☐ Telemetry unit

☐ Medical/Surgical unit

☐ Other

<obtain> Details

[End Patient Admission.]

3. Vital Signs and Monitoring

[Begin Vital Signs and Monitoring.]

[Section Prompt: Vital Signs and Monitoring.]

[Section Selection Behavior: Select all that apply. Required.]

☐ Vital signs every 4 hours

☐ Vital signs every 15 minutes times four, then every 30 minutes times four, then every 60 minutes for duration of bed rest

☐ Telemetry Monitoring

<obtain> Details

[End Vital Signs and Monitoring.]

4. Activity and Hemostasis Post Cardiac Catheterization

[Begin Activity and Hemostasis Post Cardiac Catheterization.]

[Section Prompt: For patient who is status post catheterization via radial artery:]

[Section Selection Behavior: Select all that apply. Optional.]

[Technical Note: The clinical provider should be prompted to specify the start and stop times in the following order.]

- ☐ Transradial hemostasis band as specified

<obtain> Start and stop times for transradial hemostasis band

[Section Prompt: For patient who is status post catheterization via femoral artery:]

[Section Selection Behavior: Select all that apply. Optional.]

[Technical Note: If the following arterial closure device checkbox is selected, the clinical provider should be prompted to specify the device and instructions for pressure in cuff, duration, and observation for bleeding.]

- ☐ Arterial closure device per local policy

<obtain> Device used and instructions for pressure in cuff, duration, and observation for bleeding

- ☐ Bed rest per local policy

<obtain> Number of hours of bed rest

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

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

- ☐ Elevate head of bed 30 degrees 2 hours after procedure

[End Activity and Hemostasis Post Cardiac Catheterization.]

5. Nursing Care

[Begin Nursing Care.]

[Section Prompt: Nursing Care Orders:]

[Section Selection Behavior: Select all that apply. Optional.]

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

[End Nursing Care.]

6. Medications

[Begin Medications.]

[Section Prompt: Post-procedure Medication Orders:]

[Section Selection Behavior: Select all that apply. Optional.]

- ☐ Aspirin 81 mg tablet orally every day

[Technical Note: The clinical provider should be prompted to specify the start times for all of the remaining orders in this subsection.]

- ☐ Clopidogrel tablet orally, 1 time loading dose in catheterization lab

<obtain> Dosage (300 mg or 600 mg)

<obtain> Details

- ☐ Clopidogrel 75 mg tablet orally every day beginning 1 day after loading dose
- ☐ Prasugrel 60 mg tablet orally, 1 time loading dose in catheterization lab as specified in detail

<obtain> Detail

- ☐ Prasugrel 10 mg tablet orally every day beginning 1 day after loading dose
- ☐ Ticagrelor 180 mg tablet orally, 1 time loading dose in catheterization lab as specified in detail

<obtain> Details

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

[End Medications.]

7. Laboratory Tests

[Begin Laboratory Tests.]

[Section Prompt: Laboratory Tests.]

[Section Selection Behavior: Select all that apply. Optional.]

- ☐ Comprehensive metabolic panel now
- ☐ Complete blood count (CBC) now and in 8 hours; if hemoglobin decreases > 2 g/dl with the second CBC or any subsequent CBC, repeat the CBC in 8 hours again
- ☐ Complete blood count daily
- ☐ Brain natriuretic peptide now
- ☐ Troponin now
- ☐ Magnesium now
- ☐ INR now
- ☐ aPTT now
- ☐ Fingersick glucose now

[End Laboratory Tests.]

8. Imaging and Electrocardiogram (ECG)

[Begin Imaging and Electrocardiogram (ECG).]

[Section Prompt: Imaging and Electrocardiogram (ECG).]

[Section Selection Behavior: Select all that apply. Optional.]

- ☐ 12-lead ECG postprocedural evaluation following cardiac catheterization
- ☐ 12-lead ECG as needed for chest pain

[Technical Note: The clinical provider should be prompted to specify any additional parameters for the following echocardiogram order.]

- ☐ Echocardiogram postprocedural evaluation following cardiac catheterization

<obtain> Details

- ☐ X-ray chest PA and lateral postprocedural evaluation following cardiac catheterization
- ☐ X-ray chest AP portable postprocedural evaluation following cardiac catheterization

[End Imaging and Electrocardiogram (ECG).]

[End Order Set: Cardiology: Post Cardiac Catheterization.]

Bibliography/Evidence

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Appendix A. Basic Laboratory Panel Definition

- Blood urea nitrogen
- Calcium
- Chloride
- CO₂ (Carbon dioxide, bicarbonate)
- Creatinine
- Glucose
- Potassium
- Sodium

Acronyms/Abbreviations

ACCF	American College of Cardiology Foundation
ACS	Acute Coronary Syndrome
AP	Anteroposterior
aPTT	Activated Partial Thromboplastin Time
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CART	Clinical Assessment Reporting and Tracking
CART-CL	Clinical Assessment, Reporting, and Tracking System for Cardiac Catheterization Laboratories
CBC	Complete Blood Count
CCWP	Clinical Context White Paper
CDS	Clinical Decision Support
CO2	Carbon Dioxide, Bicarbonate
CT	Computed Tomography
ECG	Electrocardiogram
HL7	Health Level 7
ICU	Intensive Care Unit
KBS	Knowledge Based Systems
KNART	Knowledge Artifact
LVEF	Left Ventricular Ejection Fraction
OIG	Office of Informatics and Information Governance
PA	Posteroanterior
PCI	Percutaneous Coronary Intervention
SCAI	Society for Cardiovascular Angiography and Interventions
SME	Subject Matter Expert
VA	Department of Veterans Affairs
VAMC	VA Medical Center