



## **Cohere Medical Policy – Left Heart Catheterization**

*Clinical Guidelines for Medical Necessity Review*

**Version:** 4  
**Revision Date:** March 6, 2025

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## Guideline Information:

**Specialty Area:** Cardiovascular Disease

**Guideline Name:** Cohere Medical Policy – Left Heart Catheterization

**Date of last literature review:** 2/24/2025

**Document last updated:** 3/5/2025

**Type:** ☒ Adult (18+ yo) | ☒ Pediatric (0-17yo)

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# Medical Necessity Criteria

## **Service: Left Heart Catheterization**

### **Recommended Clinical Approach**

Left heart catheterization is an invasive cardiac evaluation method.<sup>1,2</sup> It allows for direct evaluation of hemodynamics and is primarily used to assess for coronary artery disease (CAD).

Left heart catheterization involves the insertion of a catheter into an artery in the arm, groin, or wrist. Generally, femoral artery access is more commonly used than radial artery access for left heart catheterization.<sup>13</sup> The catheter is guided to the left ventricle of the heart to measure left ventricular pressures or to obtain an angiogram (left ventriculogram, ventriculography). Left heart catheterization is generally performed with coronary angiography to assess left ventricular pressure and function and for the presence of valvular heart disease.

Non-emergent cardiac catheterization should be performed at a facility that offers coronary intervention and has the staffing and lab availability for a percutaneous coronary intervention (PCI) if indicated. Unless there are objective findings at the time of catheterization that make intervention uncertain, intervention should occur at the time of the catheterization.<sup>3</sup>

### **Medical Necessity Criteria**

#### **Indications**

→ **Left cardiac catheterization** is considered appropriate if **ANY** of the following is **TRUE**<sup>1-11,24</sup>:

- ◆ Congenital heart disease with **ANY** of the following<sup>27</sup>:
  - Invasive cardiovascular procedure is planned, requiring pre- or post-operative catheterization or angiographic imaging (e.g., for pressure or gradient measurements); **OR**
  - Noninvasive imaging is inconclusive or discordant with findings in the physical examination; **OR**
- ◆ Hypertrophic cardiomyopathy (HCM) with **ANY** of the following<sup>26</sup>:
  - Symptomatic HCM after noninvasive imaging; **OR**

- Evidence of myocardial ischemia; **OR**
- Prior to surgical myectomy; **OR**
- ◆ Newly diagnosed congestive heart failure and **ALL** of the following:
  - Ejection fraction is less than 40%; **AND**
  - Echocardiogram is inadequate to determine the cause of dysfunction or the extent of coronary disease; **AND**
  - Contraindications to cardiac computed tomography angiography (CCTA) exist; **AND**
  - No cardiac catheterization, single photon emission computed tomography (SPECT), cardiac positron emission tomography (PET), or stress echocardiogram (ECG) has been performed since the diagnosis of congestive heart failure or cardiomyopathy; **OR**
- ◆ Suspected acute coronary syndromes (ACS), including elevated troponin or non-ST elevation myocardial infarction (NSTEMI); **OR**
- ◆ Worsening or limiting ischemic symptoms<sup>A</sup> or stable angina despite guideline-directed medical treatment (GDMT) with **ANY** of the following high-risk findings<sup>2,4</sup>:
  - Severe resting left ventricular (LV) dysfunction (left ventricular ejection fraction [LVEF] is less than 40%) that is not readily explained by noncoronary causes; **OR**
  - Reversible perfusion abnormalities that encompass greater than or equal to 10% of the myocardium (SDS = 10) in patients without prior history or evidence of myocardial infarction (MI); **OR**
  - Stress electrocardiography (ECG) findings including **ANY** of the following:
    - Greater than or equal to 2 mm of ST-segment depression at low workload; **OR**
    - Greater than or equal to 2 mm of ST-segment depression that persists into recovery; **OR**
    - Exercise-induced ST-segment elevation of greater than 1.5mm; **OR**
    - Exercise-induced ventricular tachycardia or ventricular fibrillation (VT/VF); **OR**
  - Stress-induced LV dysfunction (peak exercise LVEF is less than 40% or drop in LVEF with stress is greater than or equal to 10%); **OR**

- Stress-induced perfusion abnormalities encumbering greater than or equal to 10% of the myocardium or stress segmental scores indicating multiple vascular territories with abnormalities; **OR**
- Stress-induced LV dilation; **OR**
- Inducible wall motion abnormality (involving greater than 2 segments or 2 coronary beds); **OR**
- Wall motion abnormality developing at a low dose of dobutamine (less than or equal to 10 mg/kg/min) or at a low heart rate (less than 120 beats/min); **OR**
- Coronary artery calcium (CAC) score greater than 400 Agatston units; **OR**
- Multivessel obstructive coronary artery disease in two or more major coronary arteries (CAD; greater than or equal to 70% stenosis) on CCTA; **OR**
- Left main stenosis (greater than or equal to 50% stenosis) on CCTA; **OR**
- FFR-CT less than or equal to 0.80<sup>18,20-23</sup>; **OR**
- ◆ Ventricular fibrillation or sustained ventricular tachycardia; **OR**
- ◆ The patient has survived sudden cardiac arrest or potentially life-threatening ventricular arrhythmia<sup>25</sup>; **OR**
- ◆ Preoperative assessment before **ANY** of the following:
  - Heart valve surgery; **OR**
  - Lung transplant; **OR**
  - Liver transplant; **OR**
- ◆ The patient is being considered for or has received a heart transplant.

<sup>A</sup>**Ischemic Equivalent:** Chest pain syndrome, anginal equivalent, or ischemic electrocardiogram (ECG) abnormalities are any constellation of clinical findings that the physician believes is consistent with CAD manifestations. Examples of such findings include, but are not limited to, pain, pressure, tightness, or discomfort in the chest, shoulders, arms, neck, back, upper abdomen, or jaw, new ECG abnormalities, or other symptoms/findings suggestive of CAD. Clinical presentations in the absence of chest pain (e.g., dyspnea with exertion, fatigue, or reduced/worsening effort tolerance) consistent with CAD may also be considered an ischemic equivalent.<sup>1</sup>

## Non-indications

→ **Left cardiac catheterization** is not considered appropriate if **ANY** of the following is **TRUE**<sup>1,24</sup>:

- ◆ Coagulopathy; **OR**
- ◆ Fever; **OR**
- ◆ Systemic infection; **OR**
- ◆ Evaluation of syncope<sup>28</sup>; **OR**
- ◆ Radiopaque contrast agent allergies in patients who have not been appropriately premedicated.

## Level of Care Criteria

Inpatient and Outpatient

## Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
93454	Catheter placement in coronary artery for coronary angiography, with intraprocedural injection for coronary angiography, imaging supervision, and interpretation
93455	Catheter placement in coronary artery for coronary angiography, with intraprocedural injection for coronary angiography, imaging supervision, and interpretation, with catheter placement in bypass graft, with intraprocedural injections for bypass graft angiography
93458	Catheter placement in coronary artery for coronary angiography, with intraprocedural injection for coronary angiography, imaging supervision, and interpretation, with left heart catheterization, with intraprocedural injection for left ventriculography
93459	Catheter placement in coronary artery for coronary angiography, with intraprocedural injection for coronary angiography, imaging supervision and interpretation, with left heart catheterization, catheter placement in bypass graft, with bypass graft angiography

93595	Left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone, normal or abnormal native connections
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## Medical Evidence

Choi et al. (2023) conducted a retrospective, single-center, observational study to evaluate the discriminatory and prognostic significance of invasively measured left ventricular end-diastolic pressure in patients suspected of having heart failure with preserved ejection fraction (HFpEF). The authors focused on patients with intermediate scores on the Heart Failure Association Pre-test Assessment, Echocardiography and Natriuretic Peptide, Functional Testing, Final Etiology (HFA-PEFF) scale. A total of 404 patients were included. All patients exhibited symptoms of heart failure and preserved left ventricular ejection fraction (greater than or equal to 50%) and underwent left heart catheterization (LHC). Exclusion criteria included patients who presented without definitive HF symptoms, with acute coronary syndrome (ACS), primary cardiomyopathy, significant valvular heart disease (beyond mild stenosis or moderate left-sided regurgitation), pulmonary arterial hypertension, heart transplantation, constrictive pericarditis, or stress-induced cardiomyopathy. The authors noted that the diagnostic accuracy of the HFA-PEFF score in predicting HFpEF, confirmed through invasive hemodynamic measurement, is moderate, with an optimal cutoff value of 4.5. A strong correlation was identified between the HFA-PEFF score and the 10-year risk of all-cause death or HF readmission. Finally, elevated left ventricular end-diastolic pressure (LVEDP) was found to be linked to a significantly higher 10-year risk of all-cause death or HF readmission in patients suspected of having HFpEF. This association remained after adjusting for multiple variables, including the HFA-PEFF score. Invasive catheterization was found to be a useful adjunct tool, particularly among patients with intermediate HFA-PEFF scores.<sup>12</sup>

A 2017 study by Mustafa et al. investigated the potential health equity ramifications of limiting left heart catheterization for kidney transplant recipients. The authors examined a database of 336,354 patients with NSTEMI, of whom 742 received a kidney transplant. Kidney transplant patients were found to have been offered LHC less often than their non-transplant counterparts. Importantly, coronary angiography was associated with reduced morbidity and mortality, thereby representing an important issue of care access for patients who are disproportionately

denied LHC based on the theoretical risk of contrast-induced nephropathy.<sup>17</sup>

A 2022 publication in the *New England Journal of Medicine* investigated the utility of invasive coronary angiography for patients with stable chest pain. The DISCHARGE (Diagnostic Imaging Strategies for Patients with Stable Chest Pain and Intermediate Risk of Coronary Artery Disease) trial included 3,523 patients with completed follow-up. Patients were referred for invasive coronary angiography and had stable chest pain and intermediate pretest probability of CAD. The risk of major cardiac adverse events did not significantly differ between patients who underwent coronary angiography versus CT evaluation, with a higher rate of complications for the patients who underwent angiography. The authors concluded that these findings suggest the importance of careful patient selection for invasive coronary angiography, given the greater risk profile and limited benefits as compared to noninvasive evaluation.<sup>15</sup>

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# Clinical Guideline Revision History/Information

Original Date: March 28, 2023		
Review History		
Version 2	11/17/2023	
Version 3	3/22/2024	
Version 4	3/6/2025	<p>Annual Policy Review &amp; Restructure</p> <ul style="list-style-type: none"> <li>• Recommended clinical approach modified to reflect current internal template</li> <li>• Rewrote medical evidence section for relevance + updated to convey current literature base</li> <li>• References added with updated literature review</li> <li>• Indications streamlined to limit redundancy (i.e., the same patient population was captured by multiple indications) and improve readability and clarity. For this reason, prior CABG indication was removed, pre-TAVR indication was removed, high-risk stress test indication was removed, intermediate-risk criteria for patients with angina were removed, ACHD indication was narrowed and streamlined.</li> <li>• Several non-indications were removed as they were not absolute contraindications (i.e., acute or chronic CKD, pregnancy, normal prior testing within 2 years).</li> <li>• Non-indication for evaluation of syncope was added based on ACC guidelines.</li> </ul>