

Cardiac Catheterization



INDEPENDENT CARE HEALTH PLAN

Medical Coverage Policy

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Related Medical/Pharmacy Coverage Policies

Percutaneous Coronary Intervention Medicare Medical Coverage Policy HUM-1063

Transcatheter Valve Procedures Medicare Medical Coverage Policy HUM-1226

Related Documents

Please refer to [CMS website](#) for the most current applicable National Coverage Determination (NCD)/Local Coverage Determination (LCD)/Local Coverage Article (LCA)/CMS Online Manual System/Transmittals.

Type	Title	ID Number	Jurisdiction Medicare Administrative Contractors (MACs)	Applicable States/Territories
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LCD (and pertinent LCA)	Cardiac Catheterization and Coronary Angiography	L33557 A52850	J6 - National Government Services, Inc. (Part A/B MAC)	IL, MN, WI
LCD (and pertinent LCA)	Cardiac Catheterization and Coronary Angiography	L33959 A56500	J15 - CGS Administrators, LLC (Part A/B MAC)	KY, OH
LCD (and pertinent LCA)	Cardiac Catheterization and Coronary Angiography	L33557 A52850	JK - National Government Services, Inc. (Part A/B MAC)	CT, NY, ME, MA, NH, RI, VT

Description

Cardiac catheterization is an invasive procedure that is used to diagnose certain cardiovascular conditions. A catheter (thin, hollow tube) is inserted into the body through a blood vessel in the arm, groin or neck, then guided to the heart. Pumping ability, pressure and oxygen content in the aorta, pulmonary artery and cardiac chambers (left and right atria, left and right ventricles) may be measured. X-ray images of the coronary arteries, valves and heart chambers are taken after an injection of contrast dye has been administered to allow visualization. The heart valves (aortic, mitral, pulmonary and tricuspid) may be evaluated for leakage or narrowing that decreases heart function.

Cardiac catheterization includes, but may not be limited to, the following specific procedures:

- **Bypass graft angiography** – X-ray images are obtained of surgically created coronary artery bypass grafts to evaluate graft patency.
- **Coronary angiography (angiogram)** – A catheter is inserted from an artery in the arm, groin or wrist and into one or more of the coronary arteries to obtain x-ray images using an injection of contrast dye. The images may reveal a narrowing or blockage that reduces blood flow.
- **Coronary aortography** – X-ray images are obtained of the aorta and its branches to detect abnormalities.
- **Intravascular (endoluminal) imaging** is used to allow visualization of coronary vessel or graft lesions during a diagnostic or therapeutic cardiac catheterization procedure in order to guide treatment decisions. Techniques include, but may not be limited to:
 - **Intravascular ultrasound (IVUS)** allows visualization of the coronary artery wall by utilizing ultrasound to delineate plaque morphology and distribution and to provide guidance for transcatheter coronary intervention.
 - **Optical coherence tomography (OCT)** relies on the reflection of light to obtain cross-sectional detailed images of the coronary artery to characterize the structure and extent of atherosclerosis and assess acute stent placement.

- **Left heart catheterization** – A catheter is inserted into an artery in the arm, groin or wrist and guided to the left ventricle of the heart to measure pressures or to obtain an angiogram. This procedure is most commonly used to assess coronary anatomy and the presence of coronary artery disease, left ventricular pressure and function and valvular heart disease.
- **Right heart catheterization** – A catheter is inserted into a vein in the arm, groin or neck and guided to the right-sided heart chambers (right atrium, right ventricle) and the pulmonary artery. Pressures and blood oxygen saturations are measured in the chambers, and angiogram images of the right ventricle and pulmonary artery may be obtained. This procedure is often performed as a diagnostic test to evaluate heart failure, valvular heart disease and congenital heart disease.
- **Pulmonary artery catheterization (eg, Swan-Ganz catheterization)** – Pulmonary artery catheters (PACs) obtain direct measurements of central venous, pulmonary artery, pulmonary artery occlusion and right-sided intracardiac pressures. Cardiac output, systemic and pulmonary vascular resistance as well as mixed venous oxyhemoglobin saturation, oxygen delivery, and oxygen uptake can be estimated using PACs in the evaluation and/or management of an individual with unexplained or unknown volume status in severe cardiogenic shock, shock and suspected or known pulmonary artery hypertension (PAH).⁵⁸
- **Trans-septal catheterization** – A catheter enters the left atrium from the right atrium by puncturing through the septum (wall between the left and right atrium) to measure pressures or obtain angiogram images of the left atrium or left ventricle.

If abnormalities (eg, vessel blockage) are revealed during cardiac catheterization, treatment may occur immediately. Percutaneous coronary intervention (PCI) treats an arterial blockage or narrowing using several techniques during the cardiac catheterization procedure which include, but may not be limited to:

- **Balloon angioplasty** – A deflated balloon is threaded via a catheter through the coronary artery to the region of narrowing or blockage. The balloon is inflated to widen the blocked areas where blood flow has been reduced or cut off. A stent may then be inserted to keep the artery open and reduce the potential for recurrent blockage. For information regarding **coronary stents and angioplasty**, please refer to **Coronary Stents and Angioplasty Medicare Medical Coverage Policy**.
- **Atherectomy** – A rotating shaver is attached to the catheter tip to cut plaque away from the artery to restore optimal blood flow.

Other interventions that may occur during cardiac catheterization include, but may not be limited to:

- **Biopsy** – A sample of heart tissue or cells is removed to allow evaluation and diagnostic study.
- **Transcatheter heart valve repair or replacement** – A catheter-based procedure that repairs or replaces an abnormal or diseased heart valve to restore valve function. For information regarding **transcatheter valve procedures**, please refer to **Transcatheter Valve Procedures Medicare Medical Coverage Policy**.

Coverage Determination

iCare follows the CMS requirement that only allows coverage and payment for services that are reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member except as specifically allowed by Medicare.

In interpreting or supplementing the criteria above and in order to determine medical necessity consistently, iCare may consider the following criteria:

Right Heart Catheterization

RIGHT heart catheterization will be considered medically reasonable and necessary when **one or more** of the following requirements are met:

- Congenital heart disease, known or suspected and **one or more** of the following:
 - Direct measurement of cardiac chamber pressures or oxygen saturations needed (eg, for intracardiac shunt, valvular heart disease); **OR**
 - Invasive cardiovascular procedure planned, and preoperative or postoperative catheterization or angiographic imaging needed (eg, for pressure or gradient measurements); **OR**
 - Known supra-aortic stenosis and coronary imaging is needed due to symptoms of coronary ischemia (eg, [chest pain or anginal equivalent](#)*, syncope, arrhythmia); **OR**
 - Noninvasive imaging is nondiagnostic or discordant with physical examination findings; **OR**
- Congestive heart failure (CHF), as indicated by **one or more** of the following:
 - Associated with [chest pain or anginal equivalent](#)*; **OR**
 - Constrictive pericarditis; **OR**
 - Episodic heart failure with preserved ejection fraction on noninvasive testing; **OR**
 - Left ventricular ejection fraction (LVEF) less than 45%, unexplained by noninvasive testing; **OR**
 - Post myocardial infarction ventricular aneurysm; **OR**
 - Post myocardial infarction when LVEF less than or equal to 35%; **OR**
 - Preoperative planning needed before cardiac transplant or mechanical circulatory support; **OR**
 - Restrictive cardiomyopathy; **OR**
 - Reversible ischemia on stress echocardiogram or myocardial perfusion imaging and revascularization (eg, coronary artery bypass graft [CABG], PCI) being considered; **OR**

- Wall motion abnormality involving more than 2 segments with low dose dobutamine or at heart rate less than 120 beats per minute; **OR**
- Cor pulmonale, at initial diagnosis or with worsening symptoms; **OR**
- Endocarditis requiring valvular surgical repair³²; **OR**
- Intracardiac shunts (including septal rupture) and extracardiac vascular shunts³²; **OR**
- Pulmonary hypertension³²; **OR**
- Repeat evaluation of specific area or structure with same imaging modality, as indicated by **one or more** of the following:
 - Change in clinical status (eg, worsening symptoms or new associated symptoms); **OR**
 - Need for interval reassessment that may impact treatment plan; **OR**
 - Need for re-imaging either prior to or after performance of invasive procedure; **OR**
- Surveillance of cardiac allograft vasculopathy and acute rejection following cardiac transplant; **OR**
- Suspected disease or infection of the myocardium (including myocarditis and cardiomyopathy); **OR**
- Suspected pericardial tamponade or constriction³²; **OR**
- Valvular heart disease, known or suspected, as indicated by **one or more** of the following:
 - Atrial myxoma when transesophageal echocardiography (TEE) is indeterminate; **OR**
 - Individual is symptomatic and echocardiographic findings are equivocal for valve disease severity; **OR**
 - Mild to moderate valvular heart disease, as indicated by **one or more** of the following:
 - [Canadian Cardiovascular Society class II, III or IV](#) chest pain; **OR**
 - Ejection fraction less than or equal to 45%; **OR**
 - Heart failure; **OR**
 - Ischemia documented by noninvasive testing; **OR**
 - Noninvasive test results are inconclusive, inconsistent or discordant with individual's symptoms; **OR**
 - Preoperative planning needed before Ross procedure to identify coronary orifices if not identified noninvasively; **OR**
 - Preoperative, preprocedural or intraprocedural planning needed for indicated valve surgery, transcatheter valve replacement or repair, as indicated by **one or more** of the following:

- Coronary artery disease (CAD), known or suspected (due to risk factors, symptoms or noninvasive testing); **OR**
- Ejection fraction less than 55%; **OR**
- Transcatheter aortic valve replacement or percutaneous mitral valve repair, and need to evaluate concomitant coronary artery disease as demonstrated by coronary computed tomography angiography (CCTA); **OR**
- Severe aortic or mitral regurgitation on echocardiography;

AND EITHER:

- Physical examination findings discordant with echocardiographic or other noninvasive imaging findings; **OR**
- Pulmonary hypertension

Left Heart Catheterization

LEFT heart catheterization will be considered medically reasonable and necessary when **one or more** of the following requirements are met:

- Cardiac trauma³²; **OR**
- Congenital heart disease, known or suspected and **one or more** of the following:
 - Direct measurement of cardiac chamber pressures or oxygen saturations needed (eg, for intracardiac shunt, valvular heart disease); **OR**
 - Invasive cardiovascular procedure planned, and preoperative or postoperative catheterization or angiographic imaging needed (eg, for pressure or gradient measurements); **OR**
 - Known supraaortic stenosis and coronary imaging is needed due to symptoms of coronary ischemia (eg, [chest pain or anginal equivalent](#)*, syncope, arrhythmia); **OR**
 - Noninvasive imaging is nondiagnostic or discordant with physical examination findings; **OR**
- Coronary artery disease (CAD), known or suspected, as indicated by **one or more** of the following:
 - [Acute chest pain](#)* with **one or more** of the following:
 - Worsening frequency of [chest pain or anginal equivalent](#)* and **ALL** of the following:
 - ❖ Intermediate risk calculated using a validated risk predictor (eg, [Pretest Probability of CAD \[CAD Consortium\]](#)); **AND**

- ❖ Known CAD as evidenced by **one or more** of the following:
 - Cardiac catheterization; **OR**
 - History of prior coronary revascularization; **OR**
 - Prior anatomic testing (eg, coronary angiogram or CCTA) shows significant stenosis in the left main and/or proximal left anterior descending greater than 50% or multivessel CAD; **OR**
- Noninvasive stress imaging contraindicated or is nondiagnostic; **OR**
- Recurrent [chest pain or anginal equivalent](#)* within 9 months of PCI or CABG; **OR**
- Evidence of high risk based on noninvasive testing, as indicated by **one or more** of the following:
 - Duke Treadmill Score less than or equal to -11; **OR**
 - Echocardiographic wall motion abnormality involving greater than 2 segments, developing at dobutamine dose of less than 10 mcg/kg per minute or at a heart rate less than 120 beats per minute; **OR**
 - LVEF 40% or less at rest; **OR**
 - Perfusion imaging shows evidence of global ischemia, ischemia involving multiple territories or a single large territory of myocardium at risk; **OR**
 - Stress electrocardiogram findings of ST-segment elevation ventricular arrhythmia, or at least 2 millimeters of ST-segment depression; **OR**
 - Stress-induced large perfusion defect or multiple moderate perfusion defects; **OR**
 - Stress-induced left ventricular dysfunction; **OR**
- Following myocardial infarction and during risk stratification phase at the time of initial presentation, and **one or more** of the following:
 - Ischemia at low level of exercise on noninvasive testing; **OR**
 - LVEF less than or equal to 45%, and individual is unable to undergo noninvasive testing; **OR**
- Prinzmetal (variant) angina, suspected; **OR**
- [Stable chest pain](#)* and **one or more** of the following:

- Change in symptoms or associated precipitants and noninvasive stress imaging is contraindicated or nondiagnostic; **OR**
- Negative stress test with high clinical suspicion of CAD; **OR**
- Suspected obstructive CAD with lifestyle limiting stable [chest pain or anginal equivalent](#)* despite a trial of at least 12 weeks utilizing optimal [guideline-directed medical therapy \(GDMT\)](#)** and moderate to severe ischemia as indicated by **one or more** of the following:
 - ❖ Fractional flow reserve by computed tomography (FFR_{CT}) less than or equal to 0.80; **OR**
 - ❖ Greater than or equal to 50% stenosis in the left main coronary artery, defined by CCTA; **OR**
 - ❖ Stenosis greater than or equal to 70% in the left main and right coronary arteries and left anterior descending artery as defined by CCTA; **OR**
- Known Kawasaki disease; **OR**
- Pericardial tamponade³²; **OR**
- Preoperative or preprocedural planning needed before high-risk peripheral vascular surgery (eg, aneurysm repair) without known CAD if abnormal noninvasive stress test or [chest pain or anginal equivalent](#)*; **OR**
- Pulmonary artery extrinsic compression of left main coronary artery, as indicated by **BOTH** of the following:
 - Chronic pulmonary hypertension; **AND**
 - Ischemic heart disease, as indicated by [chest pain or anginal equivalent](#)* or abnormal left ventricular function; **OR**
- Repeat evaluation of specific area or structure with same imaging modality, as indicated by **one or more** of the following:
 - Change in clinical status (eg, worsening symptoms or new associated symptoms); **OR**
 - Need for interval reassessment that may impact treatment plan; **OR**
 - Need for re-imaging either prior to or after performance of invasive procedure; **OR**
- Surveillance of cardiac allograft vasculopathy and acute rejection following cardiac transplant; **OR**
- Suspected disease or infection of the myocardium (including myocarditis and cardiomyopathy)³²; **OR**
- Valvular heart disease, known or suspected, as indicated by any of the following:

- Atrial myxoma when TEE is indeterminate; **OR**
- Individual is symptomatic and echocardiographic findings are equivocal for valve disease severity; **OR**
- Mild to moderate valvular heart disease, as indicated by any of the following:
 - [Canadian Cardiovascular Society class II, III or IV](#) chest pain; **OR**
 - Ejection fraction less than or equal to 45%; **OR**
 - Heart failure; **OR**
 - Ischemia documented by noninvasive testing; **OR**
- Noninvasive test results are inconclusive, inconsistent or discordant with individual's symptoms; **OR**
- Preoperative planning needed before Ross procedure to identify coronary orifices if not identified noninvasively; **OR**
- Preoperative, preprocedural or intraprocedural planning needed for indicated valve surgery, transcatheter valve replacement or repair, as indicated by any of the following:
 - CAD, known or suspected (due to risk factors, symptoms or noninvasive testing); **OR**
 - Ejection fraction less than 55%; **OR**
 - Transcatheter aortic valve replacement or percutaneous mitral valve repair, and need to evaluate concomitant coronary artery disease as demonstrated by CCTA; **OR**
- Severe aortic or mitral regurgitation on echocardiography;

AND EITHER

- Physical examination findings discordant with echocardiographic or other noninvasive imaging findings; **OR**
- Pulmonary hypertension

*Chest pain includes pain, pressure, tightness or discomfort in the chest, shoulders, arms, neck, back, upper abdomen or jaw, as well as shortness of breath and fatigue and should all be considered anginal equivalents.¹¹ *Acute* chest pain occurs when the onset is new or involves a change in pattern, intensity or duration compared with previous episodes in individuals with recurrent symptoms. *Stable* chest pain occurs when symptoms are chronic and associated with consistent precipitants such as exertion or emotional stress.¹¹

**GDMT represents individualized optimal medical therapy and lifestyle modifications for CAD and may include antianginal, antihypertensive, antiplatelet and statin or other lipid-lowering therapies along with diet modification, physical activity and smoking cessation.²⁸

Coronary and Bypass Angiography

Coronary and bypass angiography will be considered medically reasonable and necessary when **one or more** of the following requirements are met:

- Anginal syndromes³³; **OR**
- Atypical [chest pain](#)* suggesting ischemia³³; **OR**
- Cardiac trauma³³; **OR**
- Congenital heart disease³³; **OR**
- Coronary shunts and fistulae³³; **OR**
- Following cardiac arrest suspected to be caused by myocardial ischemia or infarction³³; **OR**
- [High-risk](#) individual with evidence of ischemic heart disease undergoing high-risk non-cardiac surgical procedures (arterial or aortic surgery, or surgery with large fluid shifts)³³; **OR**
- Individual is undergoing a cardiac surgical procedure; **OR**
- Known atherosclerotic or other coronary disease³³; **OR**
- Myocardial infarction³³; **OR**
- Prinzmetal's angina³³; **OR**
- Repeat evaluation of specific area or structure with same imaging modality, as indicated by **one or more** of the following:
 - Change in clinical status (eg, worsening symptoms or new associated symptoms); **OR**
 - Need for interval reassessment that may impact treatment plan; **OR**
 - Need for re-imaging either prior to or after performance of invasive procedure; **OR**
- Surveillance of cardiac allograft vasculopathy and acute rejection following cardiac transplant³³; **OR**
- Suspected graft or stent (percutaneous transluminal coronary angioplasty [PTCA]) closure³³

Swan-Ganz Catheterization

Swan-Ganz catheterization will be considered medically reasonable and necessary when **one or more** of the following requirements are met:

In general, Swan-Ganz catheterization is indicated when measurement of right atrial, pulmonary artery, and pulmonary artery wedge will significantly alter patient management.³³

- Acute myocardial infarction with hemodynamic instability or septal rupture³³; **OR**
- Adult respiratory distress syndrome, to confirm the diagnosis of non-cardiogenic pulmonary edema (normal "wedge" pressure) and to aid in subsequent fluid and ventilator management³³; **OR**
- Congestive heart failure responding poorly to diuretics, especially when intravascular volume status is uncertain³³; **OR**
- Drug overdose, especially when the risk of acute lung damage is high (eg, aspirin, heroin)³³; **OR**
- End-stage liver failure with deteriorating renal function³³; **OR**
- Exacerbations of chronic obstructive lung disease requiring intubation; when it is anticipated that hemodynamic monitoring may detect occult or superimposed causes of respiratory failure not suspected clinically (eg, left ventricular dysfunction)³³; **OR**
- Intraoperative monitoring of patients undergoing open heart surgery, abdominal aortic aneurysm repair, or non-cardiac surgery in high-risk patients with known severe cardiac conditions³³; **OR**
- Selected cases of septic shock (eg, receiving vasoactive therapy)³³; **OR**
- Severe hypotension of unknown etiology, especially if the response to initial therapy is inadequate (eg, volume loading)³³; **OR**
- Suspected cases of cardiac tamponade, to confirm the diagnosis, monitor hemodynamics during pericardiocentesis, and follow response to therapy³³; **OR**
- Suspected cases of pulmonary hypertension³³; **OR**
- Suspected papillary muscle rupture³³

Intracoronary Ultrasound

Intracoronary ultrasound will be considered medically reasonable and necessary when **one or more** of the following requirements are met:

- Assessment of the extent of coronary stenosis if equivocal on angiography³²; **OR**
- Assessment of the patency and integrity of a coronary artery post-intervention³²

Doppler Functional Flow Reserve Studies

Doppler functional flow reserve studies will be considered medically reasonable and necessary when used to assess the degree of stenosis within a vessel.³²

The use of the criteria in this Medicare Advantage Medical Coverage Policy provides clinical benefits highly likely to outweigh any clinical harms. Services that do not meet the criteria above are not medically necessary and thus do not provide a clinical benefit. Medically unnecessary services carry risks of adverse outcomes and may interfere with the pursuit of other treatments which have demonstrated efficacy.

Coverage Limitations

[US Government Publishing Office. Electronic code of federal regulations: part 411 – 42 CFR § 411.15 - Particular services excluded from coverage](#)

Coding Information

Any codes listed on this policy are for informational purposes only. Do not rely on the accuracy and inclusion of specific codes. Inclusion of a code does not guarantee coverage and/or reimbursement for a service or procedure.

CPT® Code(s)	Description	Comments
75635	Computed tomographic angiography, abdominal aorta and bilateral iliofemoral lower extremity runoff, with contrast material(s), including noncontrast images, if performed, and image postprocessing	
93451	Right heart catheterization including measurement(s) of oxygen saturation and cardiac output, when performed	
93452	Left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed	
93453	Combined right and left heart catheterization including intraprocedural injection(s) for left ventriculography, imaging supervision and interpretation, when performed	
93454	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation;	
93455	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography	

93456	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right heart catheterization	
93457	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization	
93458	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed	
93459	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography	
93460	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed	
93461	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography	
93462	Left heart catheterization by transseptal puncture through intact septum or by transapical puncture (List separately in addition to code for primary procedure)	
93563	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective coronary angiography during congenital heart catheterization (List separately in addition to code for primary procedure)	

93564	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective opacification of aortocoronary venous or arterial bypass graft(s) (eg, aortocoronary saphenous vein, free radial artery, or free mammary artery graft) to one or more coronary arteries and in situ arterial conduits (eg, internal mammary), whether native or used for bypass to one or more coronary arteries during congenital heart catheterization, when performed (List separately in addition to code for primary procedure)	
93565	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective left ventricular or left atrial angiography (List separately in addition to code for primary procedure)	
93566	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective right ventricular or right atrial angiography (List separately in addition to code for primary procedure)	
93567	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for supraaortic aortography (List separately in addition to code for primary procedure)	
93568	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for pulmonary angiography (List separately in addition to code for primary procedure)	
93569	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective pulmonary arterial angiography, unilateral (List separately in addition to code for primary procedure)	
93571	Intravascular Doppler velocity and/or pressure derived coronary flow reserve measurement (coronary vessel or graft) during coronary angiography including pharmacologically induced stress; initial vessel (List separately in addition to code for primary procedure)	
93572	Intravascular Doppler velocity and/or pressure derived coronary flow reserve measurement (coronary vessel or graft) during coronary angiography including pharmacologically induced stress; each additional vessel (List separately in addition to code for primary procedure)	

93573	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective pulmonary arterial angiography, bilateral (List separately in addition to code for primary procedure)	
93574	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective pulmonary venous angiography of each distinct pulmonary vein during cardiac catheterization (List separately in addition to code for primary procedure)	
93575	Injection procedure during cardiac catheterization including imaging supervision, interpretation, and report; for selective pulmonary angiography of major aortopulmonary collateral arteries (MAPCAs) arising off the aorta or its systemic branches, during cardiac catheterization for congenital heart defects, each distinct vessel (List separately in addition to code for primary procedure)	
93593	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; normal native connections	
93594	Right heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone; abnormal native connections	
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	
93596	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); normal native connections	
93597	Right and left heart catheterization for congenital heart defect(s) including imaging guidance by the proceduralist to advance the catheter to the target zone(s); abnormal native connections	
93598	Cardiac output measurement(s), thermodilution or other indicator dilution method, performed during cardiac catheterization for the evaluation of congenital heart defects (List separately in addition to code for primary procedure)	
CPT® Category III Code(s)	Description	Comments
No code(s) identified		

HCPCS Code(s)	Description	Comments
C7516	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging supervision, interpretation and report	
C7517	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, with iliac and/or femoral artery angiography, non-selective, bilateral or ipsilateral to catheter insertion, performed at the same time as cardiac catheterization and/or coronary angiography, includes positioning or placement of the catheter in the distal aorta or ipsilateral femoral or iliac artery, injection of dye, production of permanent images, and radiologic supervision and interpretation	
C7518	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging, supervision, interpretation and report	
C7519	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	

C7520	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) includes intraprocedural injection(s) for bypass graft angiography with iliac and/or femoral artery angiography, non-selective, bilateral or ipsilateral to catheter insertion, performed at the same time as cardiac catheterization and/or coronary angiography, includes positioning or placement of the catheter in the distal aorta or ipsilateral femoral or iliac artery, injection of dye, production of permanent images, and radiologic supervision and interpretation	
C7521	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography with right heart catheterization with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging supervision, interpretation and report	
C7522	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation with right heart catheterization, with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	
C7523	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging supervision, interpretation and report	

C7524	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	
C7525	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging supervision, interpretation and report	
C7526	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	
C7527	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, with endoluminal imaging of initial coronary vessel or graft using intravascular ultrasound (ivus) or optical coherence tomography (oct) during diagnostic evaluation and/or therapeutic intervention including imaging supervision, interpretation and report	

C7528	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	
C7529	Catheter placement in coronary artery(ies) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation, with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (initial coronary vessel or graft) during coronary angiography including pharmacologically induced stress	
C7552	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) including intraprocedural injection(s) for bypass graft angiography and right heart catheterization with intravascular doppler velocity and/or pressure derived coronary flow reserve measurement (coronary vessel or graft) during coronary angiography including pharmacologically induced stress, initial vessel	
C7553	Catheter placement in coronary artery(s) for coronary angiography, including intraprocedural injection(s) for coronary angiography, imaging supervision and interpretation; with right and left heart catheterization including intraprocedural injection(s) for left ventriculography, when performed, catheter placement(s) in bypass graft(s) (internal mammary, free arterial, venous grafts) with bypass graft angiography with pharmacologic agent administration (eg, inhaled nitric oxide, intravenous infusion of nitroprusside, dobutamine, milrinone, or other agent) including assessing hemodynamic measurements before, during, after and repeat pharmacologic agent administration, when performed	

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Appendix

Appendix A

Canadian Cardiovascular Society Classification System⁵²

Classification	Symptoms
Class I	Ordinary physical activity does not cause chest pain or anginal equivalent *, such as walking, climbing stairs. Chest pain occurs with strenuous, rapid or prolonged exertion at work or recreation.
Class II	Slight limitation of ordinary activity. Chest pain or anginal equivalent * occurs on walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal conditions.
Class III	Marked limitations of ordinary physical activity. Chest pain or anginal equivalent * occurs on walking one or two blocks on the level and climbing one flight of stairs in normal conditions and at a normal pace.
Class IV	Inability to carry on any physical activity without discomfort. Chest pain or anginal equivalent * may be present at rest.

Change Summary

- 01/01/2024 New Policy.

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