LifeWise
Health Plan of Washington

MEDICAL POLICY – 2.02.507
Coronary Angiography for Known or Suspected Coronary Artery Disease in Adults

Effective Date:	Nov. 1, 2024	RELATED MEDICAL POLICIES:
Last Revised:	Jan. 1, 2025	11.01.524 Site of Service: Select Surgical Procedures
Replaces:	N/A	

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Introduction

An angiogram is a test that uses a special dye, and a type of x-ray called fluoroscopy. A coronary angiogram is specifically for the heart. After injecting the dye, a series of x-rays are taken to look at how the blood is flowing through the arteries within the heart. The goal is to find out if these arteries are narrowed or blocked. Information about the locations and extent of narrowing or blockage helps determine whether treatment is needed and what type it should be. This policy discusses when coronary angiography may be medically necessary.

Note: The Introduction section is for your general knowledge and is not to be taken as policy coverage criteria. The rest of the policy uses specific words and concepts familiar to medical professionals. It is intended for providers. A provider can be a person, such as a doctor, nurse, psychologist, or dentist. A provider also can be a place where medical care is given, like a hospital, clinic, or lab. This policy informs them about when a service may be covered.

Policy Coverage Criteria

We will review for medical necessity this elective surgical procedure.

We also will review the site of service for medical necessity. Site of service is defined as the location where the surgical procedure is performed, such as an off campus-outpatient hospital or medical center, an on campus-outpatient hospital or medical center, an ambulatory surgical center, or an inpatient hospital or medical center.

Site of Service for Elective Surgical Procedures	Medical Necessity
Medically necessary sites of service: • **Off campus-outpatient hospital/medical center** • **On campus-outpatient hospital/medical center** • **Ambulatory Surgical Center**	**Certain elective surgical procedures will be covered in the most appropriate, safe, and cost-effective site. These are the preferred medically necessary sites of service for certain elective surgical procedures**

Inpatient hospital/medical center	**Certain elective surgical procedures will be covered in the most appropriate, safe, and cost-effective site. This site is considered medically necessary only when the individual has a clinical condition which puts him or her at increased risk for complications including any of the following (this list may not be all inclusive):**
	• Anesthesia Risk
	  ○ ASA classification III or higher (see **definition**)
	  ○ Personal history of complication of anesthesia
	  ○ Documentation of alcohol dependence or history of cocaine use
	  ○ Prolonged surgery (>3 hours)
	• Cardiovascular Risk
	  ○ Uncompensated chronic heart failure (**NYHA class** III or IV)
	  ○ Recent history of myocardial infarction (MI) (<3 months)
	  ○ Poorly controlled, resistant hypertension*
	  ○ Recent history of cerebrovascular accident (< 3 months)
	  ○ Increased risk for cardiac ischemia (drug eluting stent placed < 1 year or angioplasty <90 days)
	  ○ Symptomatic cardiac arrhythmia despite medication
	  ○ Significant valvular heart disease
	• Liver Risk

Site of Service for Elective Surgical Procedures	Medical Necessity
	○ Advance liver disease (MELD Score > 8)** • Pulmonary Risk ○ Chronic obstructive pulmonary disease (COPD) (FEV1 <50%) ○ Poorly controlled asthma (FEV1 <80% despite treatment) ○ Moderate to severe obstructive sleep apnea (OSA)*** • Renal Risk ○ End stage renal disease (on dialysis) • Other ○ Morbid obesity (BMI ≥ 50) ○ Pregnancy ○ Bleeding disorder (requiring replacement factor, blood products, or special infusion product [DDAVP**** does not meet this criterion]) ○ Anticipated need for transfusion(s) **Note:** * 3 or more drugs to control blood pressure ** https://reference.medscape.com/calculator/meld-score-end-stage-liver-disease *** Moderate-AHI≥15 and ≤ 30, Severe-AHI ≥30 ****DDAVP-Deamino-Delta-D-Arginine Vasopressin (Desmopressin)
Inpatient hospital/medical center	**This site of service is considered NOT medically necessary for certain elective surgical procedures when the site of service criteria listed above in this policy are not met.**

Note: This policy only applies to adults aged 19 and older

Condition	Medical Necessity
Conditions that do not require medical review	**Coronary angiography may be considered medically necessary for the following conditions that do not require medical review:** • Congenital heart disease • Heart failure • Hypertrophic cardiomyopathy

Condition	Medical Necessity
	• Kawasaki disease • Pulmonary artery extrinsic compressions of left main coronary artery • Valvular disease • Post cardiac transplant ○ Individual has not undergone coronary angiography in the preceding six months • Individual is 19 years of age or younger

Coronary artery disease, known or suspected	**Coronary angiography for known or suspected coronary artery disease (CAD) may be considered medically necessary when criteria for any ONE of the following conditions are met:**
	Angina
	• **Stable angina** in any of the following situations:
	  ○ Recurrent angina within 9 months of percutaneous coronary intervention (PCI)
	  ○ Canadian Cardiovascular Society (CCS) class I or II classification of angina (see **Table**) with intolerance of or failure to respond to medical treatment
	  ○ CCS class III or IV classification of angina that improves to class I or II on medical treatment
	  ○ CCS class III or IV classification of angina despite optimal medical treatment
	• **Unstable angina** or non-ST-elevation myocardial infarction, and high or intermediate risk for adverse outcome, as indicated by any of the following:
	  ○ Elevated troponin levels
	  ○ Ischemia related heart failure
	  ○ Persistent hemodynamic or electrical instability
	  ○ Left ventricular ejection fraction (LVEF) < 40%
	  ○ Prior PCI* in past 6 months or prior CABG** in past 12 months
	  ○ Suspected or confirmed new ST segment depression
	  ○ Sustained ventricular arrhythmia
	  ○ Recurrent angina or ischemia at rest or low activity for > 20 minutes despite optimal medical treatment
	• Suspected Prinzmetal's angina (also known as variant angina)
	OR

Condition	Medical Necessity

	High risk for CAD based on non-invasive findings
	• High risk for CAD is suspected based on findings from non-invasive testing, as indicated by any of the following:
	  ○ Echocardiographic wall motion abnormality involving greater than 2 segments
	  ○ High-risk Duke Treadmill Score (≤ -11) (see **Table**)
	  ○ Left ventricular ejection fraction (LVEF) of 35% or less at rest
	  ○ Stress electrocardiogram findings of ST-segment elevation, **or** ventricular arrhythmia, **or** at least 2 mm of ST-segment depression
	  ○ Stress-induced large perfusion defect (particularly if anterior) or multiple moderate size perfusion defects
	  ○ Stress-induced left ventricular dysfunction (exercise LVEF < 35%)
	  ○ Significant stenosis (≥ 50%) in an unprotected left main coronary artery on recent coronary CT angiography (CCTA) (see **Related Information**).
	OR
	High Risk for CAD as evidenced on myocardial perfusion imaging
	• Other evidence of high risk on myocardial perfusion imaging, as indicated by any of the following:
	  ○ A large, fixed perfusion defect with left ventricular dilatation or increased lung uptake of radioisotope
	  ○ A stress-induced moderate perfusion defect with left ventricular dilatation or increased lung uptake of radioisotope
	  ○ Left ventricular enlargement or transient post-stress ischemic left ventricular dilatation
	OR
	After acute myocardial infarction
	• After acute myocardial infarction, for risk-stratification when any of the following are present:
	  ○ Clinically significant heart failure during hospital course
	  ○ Ischemia provoked by minimal exercise on noninvasive testing

Condition	Medical Necessity
	○ Left ventricular ejection fraction of 45% or less, and individual unable to undergo noninvasive testing **OR** **Other high-risk factors** • Ischemia that recurs (verified by clinical or noninvasive testing) within 12 months of coronary artery bypass graft (CABG) • Suspected pericarditis (acute) when signs and symptoms, troponin levels, and pattern of ST elevation cannot definitively rule out acute infarction • Individual survived sudden cardiac arrest or has a sustained ventricular tachycardia • Cardiac risk assessment needed prior to high-risk non-cardiac surgery, for an individual with disability, illness, or physical challenge that precludes non-invasive testing • Suspected stent thrombosis, either abrupt closure or subacute, following percutaneous coronary intervention • Reevaluation of a specific area or structure with same imaging modality, as indicated by 1 or more of the following: ○ Change in clinical status (e.g., worsening symptoms or new associated symptoms) ○ Need for re-imaging either prior to or after performance of invasive procedure ○ Need for interval reassessment that may impact treatment plan **Coronary angiography for known or suspected coronary artery disease is considered NOT medically necessary in the absence of the above criteria.** **Note:** * PCI: Percutaneous Coronary Intervention ** CABG: Coronary Artery Bypass Graft

Documentation Requirements
The individual's medical records submitted for review should document that medical necessity criteria are met. The record should include clinical documentation of: • Diagnosis/condition

Documentation Requirements

- History and physical examination documenting the severity of the condition
- Results and/or reports from prior imaging or testing completed
- Any prior procedures
- Other high-risk factors

Coding

Code	Description
CPT	
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

Code	Description
	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
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, nonselective, 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, nonselective, 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

Code	Description
	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

Code	Description
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 (e.g., 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
C7557	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 and intraprocedural coronary fractional flow reserve (FFR) with 3D functional mapping of color-coded FFR values for the coronary

Code	Description
	tree, derived from coronary angiogram data, for real-time review and interpretation of possible atherosclerotic stenosis(es) intervention
C7558	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 (e.g., 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 (Code termed 1/1/2025)
C7562	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 with intraprocedural coronary fractional flow reserve (ffr) with 3d functional mapping of color-coded ffr values for the coronary tree, derived from coronary angiogram data, for real-time review and interpretation of possible atherosclerotic stenosis(es) intervention (new code effective 1/1/2025)

Related Information

Definition of Terms

American Society of Anesthesiologists (ASA) Score:

ASA 1 A normal healthy patient.
ASA 2 A patient with mild systemic disease.
ASA 3 A patient with severe systemic disease.
ASA 4 A patient with severe systemic disease that is a constant threat to life.
ASA 5 A moribund patient who is not expected to survive

Angina and Heart Failure Classification Tools

The Canadian Cardiovascular Society (CCS) grading of angina, sometimes referred to as the CCS Functional Classification of Angina, is commonly used for classifying the severity of angina.

CCS Functional Classification of Angina
Class I. Ordinary physical activity does not cause angina, such as walking and climbing stairs. Angina with strenuous or rapid or prolonged exertion at work or recreation
Class II. Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking uphill, walking or stair climbing after meals, or in cold, or in wind, or under emotional stress or only during the few hours after awakening. 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 limitation of ordinary physical activity. Walking one or two blocks on the level and climbing one flight of stairs in normal conditions and at normal pace.
Class IV. Inability to carry on any physical activity without discomfort – anginal syndrome may be present at rest.

Duke Treadmill Score (DTS)

The DTS is a point system that incorporates the results from exercise duration on the treadmill, the magnitude of ST segment deviation on EKG, and exercise-induced angina. The test identifies patients with a high probability of severe coronary artery disease (triple vessel or left main coronary artery disease) that may be found at angiography and who have a higher mortality risk.

The Duke Treadmill Score is calculated as:

DTS = Exercise time (minutes) - (5 x ST deviation in mm) - (4 x angina index)

Risk level	Score	5-year mortality
Low risk	score ≥ to +5	3%
Intermediate risk	score between +5 and -11	10%
High risk	score ≤ -11	35%

New York Heart Association (NYHA) Classification:

Class I No symptoms and no limitation in ordinary physical activity, e.g., shortness of breath when walking, climbing stairs etc.
Class II Mild symptoms (mild shortness of breath and/or angina) and slight limitation during ordinary activity.
Class III Marked limitation in activity due to symptoms, even during less-than-ordinary activity, e.g., walking short distances (20–100 m). Comfortable only at rest.
Class IV Severe limitations. Experiences symptoms even while at rest. Mostly bedbound patients

Unprotected left main coronary artery refers to a patient who has not had a prior coronary artery bypass graft to the left coronary circulation.

Evidence Review

Description

Cardiac angiography is an invasive procedure that includes fluoroscopy after injection of contrast material via catheter into the great vessels, chambers, and coronary vessels of the heart, as well as venous and arterial bypass grafts or other arterial conduits such as the mammary arteries. In addition to demonstrating areas of impeded, regurgitant, or otherwise abnormal blood flow, cardiac angiography with right heart catheterization or left ventriculography enables quantitative assessment of myocardial function, such as left ventricular ejection fraction, cardiac output, or degree of shunting. It also enables quantitative assessment of coronary blood flow.

If a blockage is found, a percutaneous coronary intervention (PCI) such as angioplasty may be done to open the blockage. This may be done during the same procedure or at a later time. If there are many blockages or blockages in certain areas, a coronary artery bypass may be indicated.

Risks of coronary angiography include cardiac tamponade, arrhythmias, injury to a catheterized artery, low blood pressure, allergic reaction to contrast dye, excessive bleeding, kidney damage, stroke, or heart attack.

Coronary angiography refers specifically to the imaging of the coronary arteries to investigate coronary artery disease.

Background

For coronary artery disease, cardiac angiography may be indicated for evaluation of stable angina when symptoms cannot be medically controlled, are disabling, and when interventional treatment has been proposed as the next form of therapy. Qayyum (2008) and colleagues performed a systematic review to evaluate whether routine invasive strategy improves cardiovascular outcomes more than selective invasive strategies for acute coronary syndrome[1].

They evaluated 10 trials with a total of 10,648 individuals and found that a routine invasive strategy cannot be proven to reduce deaths or nonfatal myocardial infarction.

Cardiac angiography use is discouraged in individuals who have mild angina that is responsive to medication, with no evidence of ischemia on noninvasive testing. One major study is the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial.[6] This study looked at 2,287 individuals with stable coronary artery disease who were randomized to optimal medical therapy (OMT) with or without percutaneous coronary intervention (PCI). During a median 4.6-year follow-up, the study revealed no significant differences in the primary end point of all-cause mortality or nonfatal myocardial infarction [MI] or major secondary end points (composites of death/MI/stroke; hospitalization for acute coronary syndromes [ACSs]). There were no significant differences between treatment arms for the composite of cardiac death or MI or in any of the major pre-specified composite cardiovascular events during long-term follow-up, even after excluding peri-procedural MI as an outcome of interest. Overall, cause-specific cardiovascular outcomes paralleled closely the primary and secondary composite outcomes of the trial as a whole. Compared with an initial management strategy of OMT alone, addition of PCI did not decrease the incidence of major cardiovascular outcomes including cardiac death or the composite of cardiac death/MI/ACS/stroke in individuals with stable coronary artery disease.

Specialty society guidelines recommend cardiac angiography for risk assessment in individuals with stable ischemic heart disease when clinical characteristics and the results of noninvasive testing suggest a high likelihood of severe disease. For example, cardiac angiography is indicated when noninvasive imaging suggests the possibility of left main coronary artery stenosis or severe multi-vessel disease, or to guide percutaneous interventions.

Practice Guidelines and Position Statements

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the policy conclusions.

ACCF / AHA/ ACP / AATS / PCNA / SCAI / STS Guideline

In 2012, the American College of Cardiology Foundation/American Heart Association task force on practice guidelines, and the American College of Physicians, American Association for Thoracic Surgery, the Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons

(ACCF/AHA/ACP/AATS/PCNA/SCAI/STS) guideline for the diagnosis and management of patients with stable ischemic heart disease (SIHD) [12] detailed indications for coronary angiography.

3.2.1. Coronary Angiography as an Initial Testing Strategy to Assess Risk: Recommendations

Class I (Should be performed)

- Individuals with SIHD who have survived sudden cardiac death or potentially life-threatening ventricular arrhythmia should undergo coronary angiography to assess cardiac risk. (Level of Evidence: B – Single RCT or nonrandomized studies)
- Individuals with SIHD who develop symptoms and signs of heart failure should be evaluated to determine whether coronary angiography should be performed for risk assessment. (Level of Evidence: B – Single RCT or nonrandomized studies))

3.2.2. Coronary Angiography to Assess Risk After Initial Workup With Noninvasive Testing: Recommendations

Class I (Should be performed)

- Coronary arteriography is recommended for individuals with SIHD whose clinical characteristics and results of noninvasive testing indicate a high likelihood of severe IHD and when the benefits are deemed to exceed risk. (Level of Evidence: C – Consensus opinion, case studies or standard of care)

Class IIa (It is reasonable to perform)

- Coronary angiography is reasonable to further assess risk in individuals with SIHD who have depressed LV function (EF <50%) and moderate risk criteria on noninvasive testing with demonstrable ischemia (Level of Evidence: C - Consensus opinion, case studies or standard of care)
- Coronary angiography is reasonable to further assess risk in individuals with SIHD and inconclusive prognostic information after noninvasive testing or in individuals for whom noninvasive testing is contraindicated or inadequate. (Level of Evidence: C - Consensus opinion, case studies or standard of care)

- Coronary angiography for risk assessment is reasonable for individuals with SIHD who have unsatisfactory quality of life due to angina, have preserved LV function (EF >50%), and have intermediate risk criteria on noninvasive testing. (Level of Evidence: C - Consensus opinion, case studies or standard of care)

Class III: (No benefit)

- Coronary angiography for risk assessment is not recommended in individuals with SIHD who elect not to undergo revascularization or who are not candidates for revascularization because of comorbidities or individual preferences. (Level of Evidence: B – Single RCT or nonrandomized studies)
- Coronary angiography is not recommended to further assess risk in individuals with SIHD who have preserved LV function (EF >50%) and low-risk criteria on noninvasive testing. (Level of Evidence: B – single RCT or nonrandomized studies)
- Coronary angiography is not recommended to assess risk in individuals who are at low risk according to clinical criteria and who have not undergone noninvasive risk testing. (Level of Evidence: C - Consensus opinion, case studies or standard of care)
- Coronary angiography is not recommended to assess risk in asymptomatic individuals with no evidence of ischemia on noninvasive testing. (Level of Evidence: C - Consensus opinion, case studies or standard of care)

In 2014, the ACC/AHA/AATS/PCNA/SCAI/STS Focused Update of the Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease[14] specified a Class I recommendation for coronary angiography as useful in individuals with presumed stable ischemic heart disease who have unacceptable ischemic symptoms despite guideline-directed medical treatment and who are amenable to, and candidates for, coronary revascularization.

In 2006, the ACC/AHA/ESC guidelines for management of individuals with ventricular arrhythmias and the prevention of sudden cardiac death[11] suggested it may be the only diagnostic tool available for an individual unable to have exercise treadmill testing or stress imaging due to intolerance to pharmacologic stress or other technical reasons (e.g., obesity, severe pulmonary disease). It also is indicated in individuals resuscitated from cardiac arrest or premonitory death rhythms, such as polymorphic ventricular tachycardia or sustained ventricular tachycardia.

The National Institute for Health and Care Excellence (NICE)

In 2016 the National Institute for Health and Care Excellence (NICE) recommended coronary angiography for individuals with stable angina only when symptoms are not satisfactorily controlled with optimal medical treatment[19].

Several different risk scoring systems and clinical prediction tools (such as SYNTAX and ACUITY) have been created to help differentiate individuals who are likely to have significant obstructive disease on coronary angiography from those who are not, as well as to help determine optimal revascularization strategy and clinical outcomes. Specialty society guidelines state that calculation of the Society of Thoracic Surgeons (STS) and SYNTAX scores is reasonable in individuals who have unprotected left main coronary artery lesions and complex coronary artery disease.

Occupation of Patient that Involves Safety of Others

Abnormal results on noninvasive testing help determine cardiac risk regardless of occupation. Indications for proceeding directly to coronary angiography, without non-invasive risk stratifying studies, do not change based on occupation. Factors such as age or sedentary lifestyle alone, in absence of other diagnoses listed in the policy statement; do not convey risk sufficient to proceed directly with coronary angiography. Thus, the occupation of an individual, coupled with a factor such as sedentary lifestyle, does not, by itself, convey risk and coronary angiography would be considered not medically necessary.

References

1. Qayyum R, Khalid MR, Adomaityte J, Papadakos SP, Messineo FC. Systematic review: comparing routine and selective invasive strategies for the acute coronary syndrome. Annals of Internal Medicine 2008;148(3):186-196. PMID 18252682
2. Hemingway H, et al. Appropriateness criteria for coronary angiography in angina: reliability and validity. Annals of Internal Medicine 2008;149(4):221-231. PMID 18711152
3. Greenland P, Alpert JS, Beller GA et al. 2010 ACCF/AHA guideline for assessment of cardiovascular risk in asymptomatic adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2010; 56(25):e50-103. PMID 21144964

4. Ferket BS, Genders TS, Colkesen EB et al. Systematic review of guidelines on imaging of asymptomatic coronary artery disease. J Am Coll Cardiol. 2011; 57(15):1591-1600. PMID 21474039

5. Taylor CM, et al. A proposed clinical model for efficient utilization of invasive coronary angiography. American Journal of Cardiology 2010;106(4):457-462. PMID 20691301

6. O'Gara PT. The COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) trial: can we deliver on its promise? J Am Coll Cardiol. 2010;55(13):1359-61. PMID: 20338497.

7. Brener SJ, Prasad AJ, Abdula R, Sacchi TJ. Relationship between the angiographically derived SYNTAX score and outcomes in high-risk patients undergoing percutaneous coronary intervention. Journal of Invasive Cardiology 2011;23(2):66-69. PMID 21297202

8. Capodanno D, Di Salvo ME, Cincotta G, Miano M, Tamburino C, Tamburino C. Usefulness of the SYNTAX score for predicting clinical outcome after percutaneous coronary intervention of unprotected left main coronary artery disease. Circulation. Cardiovascular Interventions 2009;2(4):302-308. PMID 20031732

9. Palmerini T, et al. Comparison of clinical and angiographic prognostic risk scores in patients with acute coronary syndromes: Analysis from the Acute Catheterization and Urgent Intervention Triage StrategY (ACUITY) trial. American Heart Journal 2012;163(3):383-391. PMID: 22424008

10. Levine GN, et al. 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines and the Society for Cardiovascular Angiography and Interventions. Circulation 2011;124(23): e574-651. PMID 22064601

11. Hillis LD, et al. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation 2011;124: e652-735. PMID 22064599

12. Zipes DP, et al. ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: a report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop Guidelines for Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death) developed in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. Circulation 2006;114(10):e385-484. PMID 16935995

13. Fihn SD, Gardin JM, Abrams J, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: executive summary: a report of the American College of Cardiology Foundation/American Heart Association task force on practice guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. Circulation. 2012;126(25):3097-3137. PMID 23166210

14. Jneid H, et al. 2012 ACCF/AHA focused update of the guideline for the management of patients with unstable angina/non-ST-elevation myocardial infarction (updating the 2007 guideline and replacing the 2011 focused update): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation 2012;126(7):875-910. PMID 22800849

15. Fihn SD, Blankenship AC, Alexander KP, et al. 2014 ACC/AHA/AATS/PCNA/SCAI/STS Focused Update of the Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines, and the American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. Circulation 2014; 2014 Nov 4;130(19):1749-1767. PMID 25070666

16. MedlinePlus. Coronary Angiography. Last updated 02/23/2022. **http://www.nlm.nih.gov/medlineplus/ency/article/003876.htm.** Accessed July 26, 2024.

17. Fang JC, O'Gara PT. The history and physical examination: an evidence-based approach. In: Bonow RO, Mann DL, Zipes DP, Libby P, Braunwald E, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 9th ed. Philadelphia, PA: Elsevier Saunders; 2011:107-125.

18. Chaitman BR. Exercise stress testing. In: Bonow RO, Mann DL, Zipes DP, Libby P, Braunwald E, editors. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 9th ed. Philadelphia, PA: Elsevier Saunders; 2011:168-99.

19. National Institute for Health and Care Excellence. Stable angina: management . NICE Guidelines [CG126]. Published July 23, 2011. Last updated August 25, 2016. **https://www.nice.org.uk/guidance/cg126.** Accessed July 26, 2024..

20. The Criteria Committee of the New York Heart Association. Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels. 9th ed. Boston, Mass: Little, Brown & Co; 1994:253-256.

21. Goff DC Jr, Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA Guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014; 129(25 Suppl 2): S49-73. PMID 24222018

22. Patel, MR, Bailey SR, et al. 2012 ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: American College of Cardiology Foundation Appropriate Use Criteria Task Force Society for Cardiovascular Angiography and Interventions American Association for Thoracic Surgery American Heart Association, American Society of Echocardiography American Society of Nuclear Cardiology Heart Failure Society of America Heart Rhythm Society, Society of Critical Care Medicine Society of Cardiovascular Computed Tomography Society for Cardiovascular Magnetic Resonance Society of Thoracic Surgeons. Catheter Cardiovasc Interv. 2012 Sep1;80 (3):E50-81. PMID 22678595

23. Scanlon, PJ, Faxon, DP, et al. ACC/AHA Guidelines for coronary angiography: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines (Committee on Coronary Angiography). Developed in collaboration with the Society for Cardiac Angiography and Interventions. J Am Coll Cardiol. 1999; 33 (6): 1756-1824.

24. Joseph J, Velasco A, Hage FG, Reyes, E. Guidelines in review. Comparison of ESC and ACC/AHA guidelines for the diagnosis and management of patients with stable coronary artery disease. J Nucl Cardiol. 2018; 25(2): 509-515. PMID: 28884447.

25. Narula J, Chandrashekhar Y, Ahmadi A, Abbara A, et. al. SCCT 2021 Expert Consensus Document on Coronary Computed Tomographic Angiography: A report of the Society of Cardiovascular Computed Tomography. J Cardiovasc Comput Tomogr. 2021; 15(3): 192-217. PMID: 33303384.

26. Kofoed KF, Bosserdt M, Maurovich-Horvat P, et.al., Comparative effectiveness of initial computed tomography and invasive coronary angiography in women and men with stable chest pain and suspected coronary artery disease: multicentre randomised trial. BMJ. 2022 Oct 19;379:e071133. PMID: 36261169.

27. Zito A, Galli M, Biondi-Zoccai G. et.al., Diagnostic strategies for the assessment of suspected stable coronary artery disease: a systematic review and meta-analysis. Ann Intern Med. 2023;176(6):817-826. PMID: 37276592.

History

Date	Comments
06/10/13	New policy. Add to Cardiology section. This policy is approved with a 90-day hold for provider notification and will be effective on October 1, 2013.
08/15/13	Update Related Policies. Change title to policy 2.02.508.
10/17/13	Update Related Policies. Change title to policy 2.02.508
10/13/14	Annual Review. Policy extensively re-written. Policy statements reorganized but intent is unchanged. Policy updated with literature search. Reference to using MCG as a tool to guide determinations is removed. References added. Diagnosis codes (both ICD-9 and ICD-10) removed from the policy.

Date	Comments
12/22/14	Interim Review. Reference #1 removed. Related Policies 6.01.03 and 6.01.43 archived and removed.
08/11/15	Annual Review. Policy updated with literature search. Reference added. Investigational statement on Coronary Artery Calcium Scoring deleted because this technology is reviewed by AIM and the policy has been archived. Remainder of policy statement unchanged.
01/12/16	Annual Review. Policy reviewed. Literature search did not prompt adding new references. Policy statements unchanged.
03/01/17	Annual Review, approved February 14, 2017. Policy reviewed with literature search, no references added. Policy statements unchanged.
04/11/17	Policy moved into new format; no change to policy statements. Evidence Review section reformatted.
03/01/18	Annual Review, approved February 27, 2018. Minor edits for clarity. Otherwise, no change to policy statements. Reference added. Note added that this policy has been revised. Added Surgery Site of Service criteria, which becomes effective June 1, 2018.
06/01/18	Minor update; removed note and link to updated policy. Surgery Site of Service criteria becomes effective.
03/01/19	Annual Review, approved February 5, 2019. Reference added. Added indication of post cardiac transplant when criteria are met.
05/01/19	Minor update, clarified Site of Service requirements.
04/01/20	Delete policy, approved March 10, 2020. This policy will be deleted effective July 2, 2020, and replaced with InterQual criteria for dates of service on or after July 2, 2020.
07/02/20	Delete policy.
11/01/20	Policy reinstated effective February 5, 2021, approved October 13, 2020. Policy update with literature review. Reference added. Policy statements unchanged.
10/01/21	Annual Review, approved September 2, 2021. Policy updated with literature review. No references added. Policy statements unchanged.
05/01/22	Annual Review, approved April 25, 2022. Policy updated with literature review. No references added. Policy statements unchanged except for minor edits only.
01/01/23	Coding update. Added new HCPC codes Add C7516, C7517, C7518, C7519, C7520, C7521, C7522, C7523, C7524, C7525, C7526, C7527, C7528, C7529, C7552, and C7553.
04/01/23	Annual Review, approved March 20, 2023. Policy reviewed. No references added. Policy statements unchanged. Changed the wording from "patient" to "individual" throughout the policy for standardization.
08/01/23	Interim Review, approved July 11, 2023. Added medically necessary policy statement for high-risk CAD based on noninvasive findings of CCTA. Reference added.

Date	Comments
01/01/24	Coding update. Added new HCPCS codes C7557 and C7558.
11/01/24	Annual Review, approved October 21, 2024. Policy reviewed. References added. Policy statements unchanged.
01/01/25	Coding update. Added new HCPCS code C7562. Termed HCPCS code C7558.

Scope: Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.