



Percutaneous Coronary Intervention (PCI)/Angioplasty/Stent - Single Service

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Guideline Information:

Specialty Area: Cardiovascular Disease

Guideline Name: Percutaneous Coronary Intervention/Angioplasty/Stent (Single Service)

Literature review current through: 12/29/2023

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

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Medical Necessity Criteria

Service: Percutaneous Coronary Intervention (PCI)/Angioplasty/Stent

General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Coronary artery revascularization [percutaneous coronary intervention (PCI) versus coronary artery bypass graft surgery (CABG)] can occur in a number of clinical settings, including medical emergencies such as an acute myocardial infarction or an acute coronary syndrome, in contrast to less urgent environments, such as in stable ischemic heart disease (SIHD). In the latter scenario, a PCI is typically done during a heart catheterization for a symptomatic, significant stenosis or blockage that is refractory to optimal medical therapy or to improve survival as described in the 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization.¹

In patients being considered for coronary revascularization for whom the optimal treatment strategy is unclear, a multidisciplinary Heart Team (which involves the cardiologist, cardiac surgeon, and other specialists) approach is recommended. Treatment decisions should be patient-centered, incorporate patient preferences and goals, and include shared decision-making.¹

Coronary angiography remains the default method to define coronary anatomy and characterize the severity of coronary arterial stenoses. A visually estimated diameter stenosis severity of greater than or equal to 70% for non-left main disease and greater than or equal to 50% for left main disease has been used to define significant stenosis and to guide revascularization strategy. An angiographically intermediate coronary stenosis is defined as a diameter stenosis severity of 40% to 69%, and generally warrants additional investigation to assess physiological significance.¹ Coronary computed tomography angiography (CCTA) is gaining acceptance as an alternative to coronary angiography to define coronary anatomy.

- **Exclusions:** None.

Medical Necessity Criteria

Indications

→ **Percutaneous Coronary Intervention** is considered appropriate if **ANY** of the following is **TRUE**¹⁻³:

- ◆ The patient has ventricular fibrillation and significant coronary artery disease (CAD); **OR**
- ◆ The patient has polymorphic ventricular tachycardia (VT) and significant CAD; **OR**
- ◆ The patient survived cardiac arrest and has significant CAD; **OR**
- ◆ Acute ST-elevation myocardial infarction (STEMI); **OR**
- ◆ In stable patients with STEMI and multivessel disease, after successful primary PCI, staged PCI of a significant non-infarct artery stenosis; **OR**
- ◆ Non-ST-elevation acute coronary syndrome (NSTEMI/ACS); **OR**
- ◆ Unstable angina; **OR**
- ◆ Refractory angina (or ischemic equivalent) and **ALL** of the following:
 - Symptoms despite optimal medical therapy (GDMT including two anti-anginal drugs or documented intolerance)⁴; **AND**
 - Significant coronary artery stenoses as shown by **ANY** of the following:
 - Significant anatomic stenosis greater than or equal to 50% left main; **OR**
 - Significant anatomic stenosis greater than or equal to 70% non-left main CAD; **OR**
 - Significant physiological stenosis: fractional flow reserve (FFR) less than or equal to 0.80 or instantaneous wave-free ratio (iFR) less than or equal to 0.89; **OR**
- ◆ Stable ischemic heart disease (SIHD) and **ALL** of the following^{1,2}:
 - Significant left main stenosis (greater than or equal to 50%); **AND**
 - PCI is expected to provide equivalent revascularization to a CABG; **OR**
- ◆ Stable ischemic heart disease (SIHD) and multivessel CAD with significant stenoses in the three major coronary arteries that are suitable for PCI.

Non-Indications

→ **Percutaneous Coronary Intervention** is **NOT** considered appropriate if **ANY** of the following is **TRUE**:

- ◆ Stable Ischemic Heart Disease and **ALL** of the following:
 - The patient has an unprotected left main CAD with unfavorable anatomy for PCI; **AND**
 - The patient is a good candidate for CABG; **OR**
- ◆ In patients who require revascularization for significant left main CAD with high-complexity CAD, it is recommended to choose CABG over PCI to improve survival; **OR**
- ◆ In patients who require revascularization for multivessel CAD with complex or diffuse CAD (e.g., SYNTAX score greater than 33), it is reasonable to choose CABG over PCI to confer a survival advantage; **OR**
- ◆ In patients with diabetes and multivessel CAD with the involvement of the LAD, who are appropriate candidates for CABG, CABG (with a LIMA to the LAD) is recommended in preference to PCI to reduce mortality and repeat revascularizations.

Level of Care Criteria

Inpatient or Outpatient

Procedure Codes (HCPCS/CPT)

HCPCS Code	Code Description/Definition
92920	Percutaneous transluminal coronary angioplasty into single major coronary artery
92928	Percutaneous transcatheter insertion of stent into single major coronary artery
92937	Percutaneous transluminal revascularization of a single coronary artery bypass graft with angioplasty
92943	Percutaneous transluminal revascularization of chronic total occlusion of a single coronary artery branch with atherectomy, angioplasty, and insertion of stent
C9600	Percutaneous transcatheter placement of drug eluting

	intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch
C9604	Percutaneous transluminal revascularization of or through coronary artery bypass graft (internal mammary, free arterial, venous), any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel
C9607	Percutaneous transluminal revascularization of chronic total occlusion, coronary artery, coronary artery branch, or coronary artery bypass graft, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty; single vessel

Medical Evidence

National and Professional Organizations

Lawton et al. (2022) published a clinical practice guideline for the American College of Cardiology, the American Heart Association, and the Society for Cardiovascular Angiography and Interventions for coronary artery revascularization. It was recommended that in patients with significant left main disease, surgical revascularization is indicated. Percutaneous revascularization is a reasonable option to improve survival compared with medical therapy in selected patients with low to medium anatomic complexity of coronary artery disease and left main disease that is suitable for revascularization. In patients with stable ischemic heart disease, normal left ventricular ejection fraction, and triple vessel coronary artery disease, surgical revascularization may be reasonable, and percutaneous revascularization survival benefit is uncertain.¹

A 2018 European Society of Cardiology and European Association for Cardio-Thoracic Surgery guideline for myocardial revascularization (Neumann et al.) includes the following Class I recommendations (not an all-inclusive list):

- FFR or iFR are recommended to assess hemodynamic relevance of intermediate-grade stenosis
- In patients with left main or multivessel disease, the SYNTAX score should be calculated to assess the anatomical complexity of coronary artery disease (CAD) and long term risk after percutaneous coronary intervention
- The indications for revascularization in patients with stable coronary artery disease (SCAD) who receive guideline-recommended medical treatment are the persistence of symptoms despite medical treatment and/or the improvement of prognosis. The indications for improved prognosis include: Left main disease with stenosis >50%*, Proximal LAD stenosis >50%*, Two- or three-vessel disease with stenosis >50% with impaired LV function (LVEF less than or equal to 35%)*, Single remaining patent coronary artery with stenosis >50%*, and/or Large area of

ischemia detected by functional testing (>10% LV) or abnormal invasive FFR (defined as <0.75). Percutaneous coronary intervention (PCI) had a Class I indication (that was better than or equal to CABG) for patients with a low predicted procedural/surgical mortality for one-vessel CAD with or without proximal LAD stenosis, two-vessel CAD with or without proximal LAD stenosis, left main CAD with low SYNTAX scores (0-22), and three-vessel disease without diabetes mellitus with a low SYNTAX score.²

*With documented ischemia or a hemodynamically relevant lesion defined by FFR less than or equal to 0.80 or iFR less than or equal to 0.89, or >90% stenosis in a major coronary vessel.

Roffi et al. (2016) published guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation on behalf of the European Society of Cardiology. It was noted during the discussion of percutaneous coronary intervention that in acute coronary syndrome patients who underwent PCI revascularization procedures represent the most frequent, most costly and earliest cause for rehospitalization.³

Virani et al. (2023) developed a clinical practice guideline for the management of patients with chronic coronary disease for the American Heart Association and the American College of Cardiology. Revascularization has a strong recommendation in patients with life-limiting angina who are currently on guideline-based medical therapy (GDMT) and with significant coronary artery stenoses. Due to higher survival rates, coronary artery bypass grafting (CABG) is recommended over PCI in patients with chronic coronary disease with significant left main artery involvement associated with high-complexity CAD.⁴

References

1. Lawton J, Tamis-Holland J, Bangalore S, Bates E, Beckie T, et al. 2021 ACC/AHA/SCAI guideline for coronary artery revascularization: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. Dec 09, 2021. Epublished DOI: 10.1016/j.jacc.2021.09.006.
2. Neumann F, Sousa-Uva M, Ahlsson A, Alfonso F, Banning A, et al. 2018 ESC/EACTS guidelines on myocardial revascularization. *Eur Heart J*. 2019 40, 87–165 doi:10.1093/eurheartj/ehy394.
3. Roffi M, Patrono C, Collet J, Mueller C, Valgimigli M, et al. 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: Task Force for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC). *Eur Heart J*. 2016;37(3):267–315. doi:10.1093/eurheartj/ehv320.
4. Virani S, Newby L, Arnold S, Bittner V, Brewer L, et al. 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA guideline for the management of patients with chronic coronary disease: a report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2023;82:833–955.

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