

Percutaneous Coronary Interventions

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[➔ Instructions for Use](#)

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Related Medicare Advantage Reimbursement Policies
<ul style="list-style-type: none"> • Add-on Codes Policy, Professional • Assistant-at-Surgery Services Policy, Professional • Procedure and Place of Service Policy, Professional

Coverage Rationale

Overview

Percutaneous coronary intervention (PCI), commonly known as coronary angioplasty or simply angioplasty, is a non-surgical procedure used to treat the stenotic (narrowed) coronary arteries of the heart found in coronary heart disease. These stenotic segments are due to the buildup of the cholesterol-laden plaques that form due to atherosclerosis. During PCI, a cardiologist feeds a deflated balloon or other device on a catheter from the inguinal femoral artery or radial artery up through blood vessels until they reach the site of blockage in the heart. X-ray imaging is used to guide the catheter threading. At the blockage, the balloon is inflated to open the artery, allowing blood to flow. A stent is often placed at the site of blockage to permanently open the artery.

Percutaneous transluminal coronary angioplasty (PTCA) is a minimally invasive procedure to open up blocked coronary arteries, allowing blood to circulate unobstructed to the heart muscle.

CMS National Coverage Determinations (NCDs)

A National Coverage Determination (NCD) exists for percutaneous transluminal angioplasty for the treatment of atherosclerotic obstructive lesions of a single coronary artery. For coverage guidelines, refer to the NCD for [Percutaneous Transluminal Angioplasty \(PTA\) \(20.7\)](#).

CMS Local Coverage Determinations (LCDs) and Articles

Local Coverage Determinations (LCDs)/Local Coverage Articles (LCAs) exist and compliance with these policies is required where applicable. For specific LCDs/LCAs, refer to the table for [Percutaneous Coronary Interventions](#).

For coverage guidelines for states/territories with no LCDs/LCAs:

- Percutaneous coronary intervention (PCI) is reasonable and necessary in the management of:
 - Patients with acute coronary syndrome (e.g., acute myocardial infarction, unstable angina).
 - Patients with a history of significant obstructive atherosclerotic disease.
 - Patients with restenosis of a coronary artery previously treated with intracoronary stent or other revascularization procedure.
 - Patients with chronic angina.
 - Patients with silent ischemia.
- PCI is not reasonable and necessary in stable patients with angiographically intermediate stenoses and Fractional Flow Reserve (FFR) > 0.80 or Instantaneous Wave-Free Ratio (iFR) > 0.89.

- Right heart catheterization and insertion of a Swan-Ganz catheter are not generally medically necessary for a PCI, unless medically necessary when performed incident to a diagnostic catheterization prior to the intervention.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service; however, language may be included in the listing below to indicate if a code is non-covered. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
92920	Percutaneous transluminal coronary angioplasty; single major coronary artery or branch
92924	Percutaneous transluminal coronary atherectomy, with coronary angioplasty when performed; single major coronary artery or branch
92928	Percutaneous transcatheter placement of intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch
92933	Percutaneous transluminal coronary atherectomy, with intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch
92937	Percutaneous transluminal revascularization of or through coronary artery bypass graft (internal mammary, free arterial, venous), any combination of intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel
92941	Percutaneous transluminal revascularization of acute total/subtotal occlusion during acute myocardial infarction, coronary artery or coronary artery bypass graft, any combination of intracoronary stent, atherectomy and angioplasty, including aspiration thrombectomy when performed, single vessel
92943	Percutaneous transluminal revascularization of chronic total occlusion, coronary artery, coronary artery branch, or coronary artery bypass graft, any combination of intracoronary stent, atherectomy and angioplasty; single vessel

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HCPCS Code	Description
C9600	Percutaneous transcatheter placement of drug eluting intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch
C9601	Percutaneous transcatheter placement of drug-eluting intracoronary stent(s), with coronary angioplasty when performed; each additional branch of a major coronary artery (List separately in addition to code for primary procedure)
C9602	Percutaneous transluminal coronary atherectomy, with drug eluting intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch
C9603	Percutaneous transluminal coronary atherectomy, with drug-eluting intracoronary stent, with coronary angioplasty when performed; each additional branch of a major coronary artery (List separately in addition to code for primary procedure)
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
C9605	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; each additional branch subtended by the bypass graft (List separately in addition to code for primary procedure)
C9606	Percutaneous transluminal revascularization of acute total/subtotal occlusion during acute myocardial infarction, coronary artery or coronary artery bypass graft, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including aspiration thrombectomy when performed, single vessel

HCPCS Code	Description
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
C9608	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; each additional coronary artery, coronary artery branch, or bypass graft (List separately in addition to code for primary procedure)

Diagnosis Code	Description
I20.0	Unstable angina
I20.1	Angina pectoris with documented spasm
I20.81	Angina pectoris with coronary microvascular dysfunction
I20.89	Other forms of angina pectoris
I20.9	Angina pectoris, unspecified
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.3	ST elevation (STEMI) myocardial infarction of unspecified site
I21.4	Non-ST elevation (NSTEMI) myocardial infarction
I21.9	Acute myocardial infarction, unspecified
I21.A1	Myocardial infarction type 2
I21.A9	Other myocardial infarction type
I21.B	Myocardial infarction with coronary microvascular dysfunction
I22.0	Subsequent ST elevation (STEMI) myocardial infarction of anterior wall
I22.1	Subsequent ST elevation (STEMI) myocardial infarction of inferior wall
I22.2	Subsequent non-ST elevation (NSTEMI) myocardial infarction
I22.8	Subsequent ST elevation (STEMI) myocardial infarction of other sites
I22.9	Subsequent ST elevation (STEMI) myocardial infarction of unspecified site
I24.0	Acute coronary thrombosis not resulting in myocardial infarction
I24.1	Dressler's syndrome
I24.81	Acute coronary microvascular dysfunction
I24.89	Other forms of acute ischemic heart disease
I24.9	Acute ischemic heart disease, unspecified
I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110	Atherosclerotic heart disease of native coronary artery with unstable angina pectoris
I25.111	Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm
I25.112	Atherosclerotic heart disease of native coronary artery with refractory angina pectoris
I25.118	Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris
I25.119	Atherosclerotic heart disease of native coronary artery with unspecified angina pectoris
I25.3	Aneurysm of heart
I25.41	Coronary artery aneurysm
I25.42	Coronary artery dissection
I25.5	Ischemic cardiomyopathy

Diagnosis Code	Description
I25.6	Silent myocardial ischemia
I25.700	Atherosclerosis of coronary artery bypass graft(s), unspecified, with unstable angina pectoris
I25.701	Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris with documented spasm
I25.702	Atherosclerosis of coronary artery bypass graft(s), unspecified, with refractory angina pectoris
I25.708	Atherosclerosis of coronary artery bypass graft(s), unspecified, with other forms of angina pectoris
I25.709	Atherosclerosis of coronary artery bypass graft(s), unspecified, with unspecified angina pectoris
I25.710	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris
I25.711	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.712	Atherosclerosis of autologous vein coronary artery bypass graft(s) with refractory angina pectoris
I25.718	Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris
I25.719	Atherosclerosis of autologous vein coronary artery bypass graft(s) with unspecified angina pectoris
I25.720	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable angina pectoris
I25.721	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.722	Atherosclerosis of autologous artery coronary artery bypass graft(s) with refractory angina pectoris
I25.728	Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris
I25.729	Atherosclerosis of autologous artery coronary artery bypass graft(s) with unspecified angina pectoris
I25.730	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unstable angina pectoris
I25.731	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.732	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with refractory angina pectoris
I25.738	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with other forms of angina pectoris
I25.739	Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unspecified angina pectoris
I25.750	Atherosclerosis of native coronary artery of transplanted heart with unstable angina
I25.751	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm
I25.752	Atherosclerosis of native coronary artery of transplanted heart with refractory angina pectoris
I25.758	Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris
I25.759	Atherosclerosis of native coronary artery of transplanted heart with unspecified angina pectoris
I25.760	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina
I25.761	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm
I25.762	Atherosclerosis of bypass graft of coronary artery of transplanted heart with refractory angina pectoris
I25.768	Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris
I25.769	Atherosclerosis of bypass graft of coronary artery of transplanted heart with unspecified angina pectoris
I25.790	Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris

Diagnosis Code	Description
I25.791	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm
I25.792	Atherosclerosis of other coronary artery bypass graft(s) with refractory angina pectoris
I25.798	Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris
I25.799	Atherosclerosis of other coronary artery bypass graft(s) with unspecified angina pectoris
I25.810	Atherosclerosis of coronary artery bypass graft(s) without angina pectoris
I25.811	Atherosclerosis of native coronary artery of transplanted heart without angina pectoris
I25.812	Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris
I25.82	Chronic total occlusion of coronary artery
I25.83	Coronary atherosclerosis due to lipid rich plaque
I25.84	Coronary atherosclerosis due to calcified coronary lesion
I25.85	Chronic coronary microvascular dysfunction
I25.89	Other forms of chronic ischemic heart disease
I25.9	Chronic ischemic heart disease, unspecified
T82.817A	Embolism due to cardiac prosthetic devices, implants and grafts, initial encounter
T82.817D	Embolism due to cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.817S	Embolism due to cardiac prosthetic devices, implants and grafts, sequela
T82.827A	Fibrosis due to cardiac prosthetic devices, implants and grafts, initial encounter
T82.827D	Fibrosis due to cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.827S	Fibrosis due to cardiac prosthetic devices, implants and grafts, sequela
T82.837A	Hemorrhage due to cardiac prosthetic devices, implants and grafts, initial encounter
T82.837D	Hemorrhage due to cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.837S	Hemorrhage due to cardiac prosthetic devices, implants and grafts, sequela
T82.847A	Pain due to cardiac prosthetic devices, implants and grafts, initial encounter
T82.847D	Pain due to cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.847S	Pain due to cardiac prosthetic devices, implants and grafts, sequela
T82.855A	Stenosis of coronary artery stent, initial encounter
T82.855D	Stenosis of coronary artery stent, subsequent encounter
T82.855S	Stenosis of coronary artery stent, sequela
T82.856A	Stenosis of peripheral vascular stent, initial encounter
T82.856D	Stenosis of peripheral vascular stent, subsequent encounter
T82.856S	Stenosis of peripheral vascular stent, sequela
T82.857A	Stenosis of other cardiac prosthetic devices, implants and grafts, initial encounter
T82.857D	Stenosis of other cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.857S	Stenosis of other cardiac prosthetic devices, implants and grafts, sequela
T82.867A	Thrombosis due to cardiac prosthetic devices, implants and grafts, initial encounter
T82.867D	Thrombosis due to cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.867S	Thrombosis due to cardiac prosthetic devices, implants and grafts, sequela
T82.897A	Other specified complication of cardiac prosthetic devices, implants and grafts, initial encounter
T82.897D	Other specified complication of cardiac prosthetic devices, implants and grafts, subsequent encounter
T82.897S	Other specified complication of cardiac prosthetic devices, implants and grafts, sequela
T82.9XXA	Unspecified complication of cardiac and vascular prosthetic device, implant and graft, initial encounter
T82.9XXD	Unspecified complication of cardiac and vascular prosthetic device, implant and graft, subsequent encounter

Diagnosis Code	Description
T82.9XXS	Unspecified complication of cardiac and vascular prosthetic device, implant and graft, sequela

Definitions

Fractional Flow Reserve (FFR): The ratio of maximal blood flow in a region distal to a lesion compared with the normal maximal blood flow of an artery (Lawton et al., 2022).

Instantaneous Wave-Free Ratio (iFR): The Instantaneous Wave-Free Ratio (in diastole) of coronary pressure distal to the coronary lesion (Pd) to the aortic pressure (Pa), an index of lesion severity (Lawton et al., 2022).

Centers for Medicare and Medicaid Services (CMS) Related Documents

After checking the table below and searching the [Medicare Coverage Database](#), if no NCD, LCD, or LCA is found, refer to the criteria as noted in the [Coverage Rationale](#) section above.

NCD	LCD	LCA	Contractor Type	Contractor Name
Percutaneous Coronary Interventions				
NCD 20.7 Percutaneous Transluminal Angioplasty (PTA)	L34761 Percutaneous Coronary Interventions	A57479 Billing and Coding: Percutaneous Coronary Interventions	Part A and B MAC	WPS*
	L33623 Percutaneous Coronary Intervention	A56823 Billing and Coding: Percutaneous Coronary Intervention	Part A and B MAC	NGS

Medicare Administrative Contractor (MAC) With Corresponding States/Territories	
MAC Name (Abbreviation)	States/Territories
CGS Administrators, LLC (CGS)	KY, OH
First Coast Service Options, Inc. (First Coast)	FL, PR, VI
National Government Services, Inc. (NGS)	CT, IL, ME, MA, MN, NH, NY, RI, VT, WI
Noridian Healthcare Solutions, LLC (Noridian)	AS, AK, AZ, CA, GU, HI, ID, MT, NV, ND, Northern Mariana Islands, OR, SD, UT, WA, WY
Novitas Solutions, Inc. (Novitas)	AR, CO, DC, DE, LA, MD, MS, NJ, NM, OK, PA, TX, VA**
Palmetto GBA (Palmetto)	AL, GA, NC, SC, TN, VA**, WV
Wisconsin Physicians Service Insurance Corporation (WPS)*	IA, IN, KS, MI, MO, NE
Notes	
*Wisconsin Physicians Service Insurance Corporation: Contract Number 05901 applies only to WPS Legacy Mutual of Omaha MAC A Providers.	
**For the state of Virginia: Part B services for the city of Alexandria and the counties of Arlington and Fairfax are excluded for the Palmetto GBA jurisdiction and included within the Novitas Solutions, Inc. jurisdiction.	

CMS Claims Processing Manual

[Chapter 4; § 61.5 Billing for Intracoronary Stent Placement](#)

[Chapter 12; § 30 Correct Coding Policy](#)

[Chapter 13; § 20 Payment Conditions for Radiology Services](#)

Clinical Evidence

Swan-Ganz catheters were first used to guide therapy post acute myocardial infarction but are now being used in various settings. Right-sided heart catheterization has not been shown to improve outcomes. Indications include many diagnostic uses including differentiation of various causes of shock and pulmonary edema, the differentiation of pericardial tamponade from constrictive pericarditis and restrictive cardiomyopathy, the evaluation of pulmonary hypertension, the diagnosis of left-to-right intracardiac shunts, and to guide fluid management and hemodynamic monitoring of patients after

surgery or complicated myocardial infarction and for patients in heart failure, shock, etc. There is no absolute contraindication for use of pulmonary artery catheters, but care should be taken in the elderly and patients with severe pulmonary hypertension. Coronary angiography should be performed to visualize the lesion and serve as a roadmap for percutaneous coronary intervention (PCI) (Bangalore and Bhatt, 2011 published in the AHA Journal).

Jakobsen et al. (2025) compared the outcome after percutaneous coronary intervention (PCI) for in-stent restenosis (ISR) and de novo indications from the SORT OUT randomized, all-comer, 2-arm, blinded–end point stent comparison trials. Out of 19,375 patients included in the SORT OUT trials, 2,928 had prior PCIs, of which 2,437 (83%) were treated for de novo stenosis and 491 (17%) were treated for ISR. Baseline characteristics were not significantly different. At 5 years, major adverse cardiac events (MACE) were observed in 654 patients (28%) in the de novo stenosis group and 148 patients (32%) in the ISR group [crude and adjusted hazard ratio 1.16 (95% confidence interval {CI} 0.97 to 1.38) and 1.16 (95% CI 0.97 to 1.38)]. The risk of target lesion revascularization (TLR) was higher in the ISR group compared to the de novo stenosis group [crude and adjusted hazard ratio 1.64 (95% CI 1.24 to 2.17) and 1.71 (95% CI 1.27 to 2.30)]. The authors concluded that after 5 years, MACE risk was similar between PCI for de novo lesions and ISR but the risk of TLR was higher in the ISR group compared to the de novo stenosis group. The study's main limitation was the lack of information about the stents in the ISR cases.

Park et al. (2024) assessed the open-label, randomized controlled trial (PREVENT), to see if preventive percutaneous coronary intervention of non-flow-limiting vulnerable plaques improves clinical outcomes compared with optimal medical therapy alone. One thousand six hundred and six patients aged 18 years or older with non-flow-limiting vulnerable coronary plaques identified by intracoronary imaging were randomly assigned (1:1) to either percutaneous coronary intervention (PCI) plus optimal medical therapy or optimal medical therapy alone. PCI of vulnerable plaques was performed with bioresorbable vascular scaffolds (Absorb™ BVS; Abbott, Santa Clara, CA, USA). Following the withdrawal of bioresorbable vascular scaffolds from the market, cobalt chromium everolimus-eluting metallic stents (Xience; Abbott, Santa Clara, CA, USA). The primary outcome was the composite of death from cardiac causes, target-vessel myocardial infarction, ischemia-driven target-vessel revascularization, or hospitalization for unstable or progressive angina, at 2 year follow up. Secondary outcomes were the individual components of the composite death from any cardiac cause, any myocardial infarction, any revascularization, stent or scaffold thrombosis, stroke, bleeding events, angina status, procedural complications, and the patient-oriented composite of all-cause death, all myocardial infarctions, or any repeat revascularization. The results showed reduced the risks of all primary outcome measures compared to optimal medical therapy alone, and the composite of death from cardiac causes was sustained through 7 years. All secondary outcome measures were also reduced with preventive percutaneous coronary intervention. The authors concluded that this trial shows that preventive percutaneous coronary intervention might reduce the 2-year and long-term risks of major cardiac events arising from vessels containing vulnerable plaques compared with optimal medical therapy alone. This trial is limited by the Absorb BVS was removed from the market in 2017 due to an increase in in-scaffold thrombosis, as well as potential author conflicts of interest.

Giacoppo et al. (2023) reported on the 10-year outcomes of the ISAR-DESIRE 3 randomized controlled trial regarding coronary artery restenosis treatment. They compared efficacy and safety of plain balloon (PB), paclitaxel-eluting stent (PES), and paclitaxel-coated balloon (PCB) for percutaneous coronary intervention (PCI) of drug-eluting stent in-stent restenosis (DES-ISR). 402 patients (500 lesions) with DES-ISR were randomly assigned to PB angioplasty (134 patients, 160 lesions), PCB angioplasty (137 patients, 172 lesions), and PES implantation (131 patients, 168 lesions). The authors concluded that after 10 years, the primary and major secondary endpoints between PES and PCB showed no significant difference. However, an excess of death and cardiac death within 5 years associated with PES and the results of the competing risk analysis are hard to interpret and need further analysis. PCB and PES substantially lowered target lesion revascularization compared with PB. Study limitations included that the trial was initially designed on the surrogate efficacy endpoint of percentage diameter stenosis as evaluated by 6-8 month angiography follow-up, therefore the current, post hoc analysis relies on limited sample size.

Lee et al. (2023) conducted a prospective, multicenter, randomized, open-label trial, which compared the clinical outcomes of intravascular imaging–guided percutaneous coronary intervention (PCI) for complex coronary-artery lesions compared with outcomes after angiography-guided PCI. One thousand three hundred and sixty nine patients were randomized 2:1 to undergo intravascular image guided (1092) or angiography guided (547) PCI. In the intravascular guided group, the use of ultrasonography or optical coherence tomography was at the doctor's discretion. The primary end points were a composite of death from cardiac causes, target-vessel–related myocardial infarction, or clinically driven target-vessel revascularization at a median follow up of 2.1 years. The results showed at median follow up, one of the primary end point events occurred in 76 patients in the intravascular group and 60 patients in the angiography group. In the intravascular group death from cardiac causes occurred in 16 patients, target-vessel–related myocardial infarction occurred in 38, and clinically driven target-vessel revascularization in 32. In the angiography group, death from cardiac causes occurred in 17 patients, target-vessel–related myocardial infarction occurred in 30 patients, and clinically driven

target vessel revascularization occurred in 25. There were no apparent between-group differences in the incidence of procedure related safety events. The authors concluded that intravascular imaging-guided PCI for complex coronary artery lesions was associated with a lower incidence of a composite of death from cardiac causes, target-vessel-related myocardial infarction, or clinically driven target-vessel revascularization than angiography-guided PCI. Limitations of this trial include that more than half of the trial population were from a single center of only East Asian patients which limits the generalizability of the findings.

Holm et al. (2020) reported on the 5 year outcomes of the prospective, randomized, open-label, non-inferiority clinical trial (NOBLE), evaluating whether percutaneous coronary intervention (PCI) was non-inferior to coronary artery bypass grafting (CABG) in the treatment of left main coronary artery disease. The primary endpoint was major adverse cardiac or cerebrovascular events (MACCE), combined all-cause mortality, non-procedural myocardial infarction, repeat revascularization, and stroke. Secondary endpoints included all-cause mortality, non-procedural myocardial infarction, and repeat revascularization. In the trial, 1,201 participants with left main coronary artery disease requiring revascularization were randomly assigned (1:1) to receive PCI or CABG. The median follow up was 4.9 years. The results show MACCE events were 28% for participants that received PCI, and 19% for those receiving CABG. After 5 years of follow-up, PCI did not reach the threshold for non-inferiority, and CABG was found to be superior to PCI for the primary endpoint of MACCE. All-cause mortality rates were similar, but PCI was associated with increased occurrence of non-procedural myocardial infarction and repeat revascularization. The authors concluded that for revascularization of left main coronary artery disease, PCI was associated with inferior 5-year clinical outcome compared with CABG. Mortality was similar, but patients treated by PCI had higher rates of non-procedural myocardial infarction and repeat revascularization. The study was limited by its open-label/non-blinded design.

Choi et al. (2019) conducted a study to compare the long term outcomes of revascularization versus medical management in patients with silent myocardial ischemia. One thousand four hundred and seventy three consecutive asymptomatic patients with at least 1 epicardial coronary stenosis with $\geq 50\%$ diameter stenosis in coronary angiography, and evidence of inducible myocardial ischemia were selected from a prospective institutional registry. The revascularization [coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI)] cohort consisted of 709 individuals, and the medical management (antiplatelet agents, beta-blockers, renin angiotensin system blockers, and lipid lowering agents, including statins) group had 764. All participants underwent at least 1 non-invasive stress test. The primary outcome was cardiac death at up to 10 years follow up. The results showed that compared with the medical management alone participants, the revascularization treatment group showed significantly lower risk of cardiac death, 25.4% vs. 33.7%, respectively. The risk of all-cause death and any revascularization were also significantly lower in the revascularization group. Among the patients with medical management alone, 146 patients underwent PCI during follow-up for ischemia-driven revascularization at a median time point of 38 months. The authors concluded that among asymptomatic patients with objective signs of inducible myocardial ischemia, revascularization treatment showed significantly lower long-term risk of cardiac death compared with the medical treatment (MT) alone group. These current results support contemporary practice of ischemia directed revascularization, even in patients with silent myocardial ischemia. Study limitations included the non-randomized nature of registry data, the types of non-invasive tests were different, follow-up non-invasive stress tests were not done in all revascularized patients, laboratory or medication follow-up could not be evaluated due to limited data availability, and the possibility of accompanied microvascular disease or diffuse atherosclerotic narrowing without focal stenosis could not be explored fully.

Clinical Practice Guidelines

American College of Cardiology (ACC)/American Heart Association (AHA)/American College of Emergency Room Physician (ACEP)/National Association of Emergency Medical Services (EMS) Physicians (NAEMSP)/Society for Cardiovascular Angiography and Interventions (SCAI)

Rao et al. (2025) published the 2025 joint guidelines for the management of patients with acute coronary syndromes and provide the following recommendations:

- Patients with ST-elevation myocardial infarction (STEMI) presenting less than 12 hours after symptom onset, primary percutaneous coronary intervention (PPCI) should be performed with a goal of first medical contact (FMC) to device activation of ≤ 90 minutes, or ≤ 120 minutes in patients requiring hospital transfer to improve survival (strong recommendation).
- Patients with acute coronary syndrome (ACS) and cardiogenic shock or hemodynamic instability, emergency revascularization of the culprit vessel by PCI or coronary artery bypass graft (CABG) is indicated to improve survival, regardless of time from symptom onset (strong recommendation).
- Patients with STEMI presenting 12-24 hours after symptom onset, PPCI is reasonable to improve clinical outcomes (moderate recommendation).

- Patients with STEMI present greater than 24 hours after symptom onset with the presence of life-threatening arrhythmia or ongoing ischemia, PPCI is reasonable to improve clinical outcomes (moderate recommendation).
- Patients stable with STEMI who have a totally occluded infarct-related artery greater than 24 hours after symptom onset and no evidence of acute severe heart failure (HF), ongoing ischemia, or life-threatening arrhythmia, PPCI should not be performed due to lack of benefit (no benefit/weak recommendation).

American College of Cardiology (ACC)/American Heart Association (AHA)/Society for Cardiovascular Angiography and Interventions (SCAI)

Lawton et al. (2022) published the 2021 joint guidelines for coronary artery revascularization, which replaces the 2011 coronary artery bypass graft surgery and the 2011 and 2015 percutaneous coronary intervention guidelines. This update provides a patient-centric approach to guide clinicians in the treatment of patients with significant coronary artery disease undergoing coronary revascularization. In stable patients with angiographically intermediate stenoses and fractional flow reserve (FFR) > 0.80 or instantaneous wave-free ratio (iFR) > 0.89, the recommendation is that PCI should not be performed [Strength of Recommendation: 3 (no benefit)], Level of Evidence: B-R (moderate quality evidence from one or more well designed studies).

American Heart Association (AHA)/American College of Cardiology (ACC)/American College of Clinical Pharmacy (ACCP)/American Society for Preventive Cardiology (ASPC)/National Lipid Association (NLA)/Preventive Cardiovascular Nurses Association (PCNA)

Virani et al. (2023) published the 2023 joint guidelines for the management of patients with chronic coronary artery disease, which updates and consolidates the 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease and the corresponding 2014 ACC/AHA/AATS/PCNA/SCAI/STS Focused Update of the Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease. These new guidelines state the following with regard to percutaneous coronary intervention (PCI):

- In selected patients with chronic coronary disease (CCD) and significant left main stenosis for whom PCI can provide equivalent revascularization to that possible with coronary artery bypass grafting (CABG), PCI is reasonable to improve survival.
- In patients with CCD who are appropriate for revascularization but poor candidates for surgery, it is reasonable to choose PCI over CABG to improve symptoms and reduce major adverse cardiovascular events (MACE).
- In patients with CCD and diabetes who have left main stenosis and low- or intermediate-complexity coronary artery disease (CAD) (e.g., SYNTAX score ≤ 33), PCI may be considered as an alternative to CABG to reduce MACE.

National Institute for Health and Care Excellence (NICE)

NICE guidelines (2020) on acute coronary syndromes make the following recommendations:

- Offer coronary angiography, with follow-on primary percutaneous coronary intervention (PCI) if indicated, as the preferred coronary reperfusion strategy for people with acute ST-elevation myocardial infarction (STEMI), if:
 - Patient presents within 12 hours of symptom onset, and
 - Primary PCI can be performed within 120 minutes of the time when fibrinolysis could have been given.
- Offer coronary angiography, with follow-on primary PCI if indicated, to those with acute STEMI and cardiogenic shock who present within 12 hours of symptom onset of STEMI.
- Consider coronary angiography, with follow-on primary PCI if indicated, for those with acute STEMI presenting greater than 12 hours after symptom onset if there is evidence of continuing myocardial ischemia.
- Consider coronary angiography, with a view to coronary revascularization if indicated, for people with acute STEMI who present greater than 12 hours after symptom onset and who have cardiogenic shock or go on to develop it.
- Consider radial (in preference to femoral) arterial access for those undergoing coronary angiography (with follow-on primary PCI if indicated).
- Offer immediate coronary angiography to those with unstable angina or NSTEMI if their clinical condition is unstable.
- Consider coronary angiography (with follow-on PCI if indicated) within 72 hours of first admission for those with unstable angina or NSTEMI who have an intermediate or greater risk of adverse cardiovascular events (predicted 6-month mortality above 3.0%) and do not have contraindications to angiography (such as comorbidity or active bleeding).
- Consider coronary angiography (with follow-on PCI if indicated) for those with unstable angina or NSTEMI who are initially assessed to be at low risk of adverse cardiovascular events (predicted 6-month mortality 3.0% or less) if ischemia is demonstrated by ischemia testing or is subsequently experienced.

NICE guidelines (2011; updated 2016) on stable angina management recommend offering percutaneous coronary intervention (PCI) to those with stable angina and suitable coronary anatomy when:

- Symptoms are unsatisfactorily controlled with optimal medical treatment, and
- Revascularization is considered appropriate, and
- Coronary artery bypass grafting (CABG) is not appropriate.

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Policy History/Revision Information

Date	Summary of Changes
10/01/2025	<p>Related Policies</p> <ul style="list-style-type: none"> • Added reference link to the UnitedHealthcare Medicare Advantage Reimbursement policy titled <i>Add-on Codes Policy, Professional</i> • Removed reference link to the UnitedHealthcare Medicare Advantage Reimbursement policy titled: <ul style="list-style-type: none"> ○ <i>Multiple Procedure Payment Reduction (MPPR) on Diagnostic Cardiovascular and Ophthalmology Procedures Policy, Professional</i> ○ <i>Multiple Procedure Payment Reduction (MPPR) for Medical and Surgical Services Policy, Professional</i> <p>Supporting Information</p> <ul style="list-style-type: none"> • Added <i>Definitions</i> section • Updated <i>Clinical Evidence</i> and <i>References</i> sections to reflect the most current information • Archived previous policy version MMP235.13

Instructions for Use

The Medicare Advantage Policy documents are generally used to support UnitedHealthcare coverage decisions. It is expected providers retain or have access to appropriate documentation when requested to support coverage. This document may be used as a guide to help determine applicable:

- Medical necessity coverage guidelines; including documentation requirements, and/or
- Medicare coding or billing requirements.

Medicare Advantage Policies are applicable to UnitedHealthcare Medicare Advantage Plans offered by UnitedHealthcare and its affiliates. This Policy is provided for informational purposes and does not constitute medical advice. It is intended to serve only as a general reference and is not intended to address every aspect of a clinical situation. Physicians and patients should not rely on this information in making health care decisions. Physicians and patients must exercise their independent clinical discretion and judgment in determining care. Treating physicians and healthcare providers are solely responsible for determining what care to provide to their patients. Members should always consult their physician before making any decisions about medical care.

Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The member specific benefit plan document identifies which services are covered, which are excluded, and which are subject to limitations. In the event of a conflict, the member specific benefit plan document supersedes this policy. For more information on a specific member's benefit coverage, please call the customer service number on the back of the member ID card or refer to the [Administrative Guide](#).

Medicare Advantage Policies are developed as needed, are regularly reviewed, and updated, and are subject to change. They represent a portion of the resources used to support UnitedHealthcare coverage decision making. UnitedHealthcare may modify these Policies at any time by publishing a new version on this website. Medicare source materials used to develop these policies may include, but are not limited to, CMS statutes, regulations, National Coverage Determinations (NCDs), Local Coverage Determinations (LCDs), and manuals. This document is not a replacement for the Medicare source materials that outline Medicare coverage requirements. The information presented in this Policy is believed to be accurate and current as of the date of publication. Where there is a conflict between this document and Medicare source materials, the Medicare source materials apply. Medicare Advantage Policies are the property of UnitedHealthcare. Unauthorized copying, use, and distribution of this information are strictly prohibited.

UnitedHealthcare follows Medicare coverage guidelines found in statutes, regulations, NCDs, and LCDs to determine coverage. The clinical coverage criteria governing certain items or services referenced in this Medical Policy have not been fully established in applicable Medicare guidelines because there is an absence of any applicable Medicare statutes, regulations, NCDs, or LCDs setting forth coverage criteria and/or the applicable NCDs or LCDs include flexibility that explicitly allows for coverage in circumstances beyond the specific indications that are listed in an NCD or LCD. As a result, in these circumstances, UnitedHealthcare applies internal coverage criteria as referenced in this Medical Policy. The internal coverage criteria in this Medical Policy was developed through an evaluation of the current relevant clinical evidence in acceptable clinical literature and/or widely used treatment guidelines. UnitedHealthcare evaluated the evidence to determine whether it was of sufficient quality to support a finding that the items or services discussed in the policy might, under certain circumstances, be reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member.

Providers are responsible for submission of accurate claims. Medicare Advantage Policies are intended to ensure that coverage decisions are made accurately. UnitedHealthcare Medicare Advantage Policies use Current Procedural Terminology (CPT®), Centers for Medicare and Medicaid Services (CMS), or other coding guidelines. References to CPT® or other sources are for definitional purposes only and do not imply any right to reimbursement or guarantee claims payment.

For members in UnitedHealthcare Medicare Advantage plans where a delegate manages utilization management and prior authorization requirements, the delegate's requirements need to be followed.