

Quick Evidence Synopsis

Percutaneous Coronary Intervention or Coronary Artery Bypass Grafting for Patients with Coronary Artery Disease

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Clinical question: What are the benefits and harms of percutaneous coronary intervention (PCI) versus coronary artery bypass grafting (CABG) for multi-vessel, left main, and single-vessel proximal left anterior descending (LAD) coronary artery disease (CAD)?

What does the evidence conclude?

Intervention	Quality of Evidence	Balance Between Benefits and Harms
CABG vs PCI	Moderate	Trade-off between benefits and harms for both CABG and PCI, with CABG offering a mortality benefit over PCI in patients with multi-vessel CAD, especially those with significant risk factors, such as diabetes mellitus; the relative benefit of 1 procedure over another in reducing mortality is less clear in patients with less complex anatomic lesions. PCI offers some advantage in lower incidence of complicating stroke but a higher rate of need for subsequent target lesion reintervention compared with CABG.

Quality of evidence: Quality of evidence scale (Grading of Recommendations Assessment, Development and Evaluation [GRADE]): high, moderate, low, and very low. For more information on the GRADE rating system, see <http://www.grade-workinggroup.org/index.htm>.

Balance between benefits and harms: The Guideline Elements Model: beneficial, likely to be beneficial, unknown effectiveness, trade-off between benefits and harms, likely harmful, and harmful. For more information, see <http://gem.med.yale.edu/default.htm>.

What are the parameters of the authors' evidence search?

Population: adults with CAD, including multi-vessel (2- or 3-vessel disease; multi-vessel disease [MVD]), left main disease (LMD), or single-vessel proximal LAD, with or without diabetes
Setting: inpatient
Intervention: PCI
Comparator: CABG
Outcomes: mortality (all-cause); stroke; myocardial infarction; stent thrombosis (definite or probable stent thrombosis, time to occurrence); angiographic restenosis; and need for repeat revascularization

What is the basis for the conclusion?

Population: adults with CAD, including MVD (2 or 3 vessel), LMD, or single-vessel proximal LAD disease, with or without diabetes

Settings: inpatient

Intervention: PCI (bare-metal stents and drug-eluting stents)

Comparator: CABG ([Table 1](#))

Table 1

Summary of recent systematic reviews addressing percutaneous coronary intervention versus coronary artery bypass grafting in patients with and without diabetes

Author (Year)	Study Type (Number of Participants)	Population, Intervention	Outcomes	Estimate of Effect (95% CI)	Key Results
Sipahi et al, ¹ 2014	MA of 6 RCTs ^a (N = 6055)	Patients with MVD randomly assigned to CABG vs PCI (including both BMS and drug-eluting stent) 2 RCTs = 100% diabetic patients 4 RCTs = 33% diabetic patients ^a Included patients with stable and unstable angina	All-cause mortality, myocardial infarction, repeat revascularization, stroke, MACCE ^a	Mortality (all-cause): RR, 0.73 (95% CI, 0.62–0.86; <i>P</i> <.001) Stroke: RR, 1.36 (95% CI, 0.99–1.86; <i>P</i> <.06)	CABG favors lower risk of mortality. PCI may favor lower risk of stroke. Subanalysis demonstrated no difference in mortality outcome in participants with or without diabetes.
Smit et al, ² 2015	MA of 31 RCTs (N = 15,004)	Patients with MVD, SVD, LAD, or LMD, with or without unstable angina randomly assigned to PCI (BMS and drug-eluting stents) vs CABG	All-cause mortality, myocardial infarction, repeat revascularization, stroke	Mortality (all-cause): OR, 1.1 (95% CI, 1.0–1.3; <i>P</i> = .05) Stroke: OR, 0.7 (0.5–0.9; <i>P</i> = .01)	All patient groups CABG favors lower risk of mortality. PCI favors lower risk of stroke.
Deb et al, ³ 2013	Systematic review ^b of 13 RCTs, 5 MAs LMD, N = 705 MVD, N = 1088 ⁴	Patients with MVD, LMD, or left ventricular dysfunction randomly assigned to CABG vs PCI (BMS and drug-eluting stents)	MACCE, stroke, mortality, repeat revascularization, myocardial infarction	<i>LMD</i> CABG vs PCI Mortality: RR, 0.88 (95% CI 0.58, 1.32) Stroke: 0.33 (95% CI 0.12, 0.92) ⁵ <i>MVD</i> ⁴ Mortality (all-cause): 11.4% vs 13.9% (<i>P</i> = .10) Stroke: 3.7% vs 2.4% (<i>P</i> = .09)	<i>LMD</i> There was no difference in mortality. PCI favors lower risk of stroke. <i>MVD</i> There was no difference in mortality or stroke outcomes.

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