ACC/AHA Guidelines for Percutaneous Coronary Intervention

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Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina

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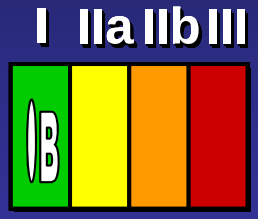
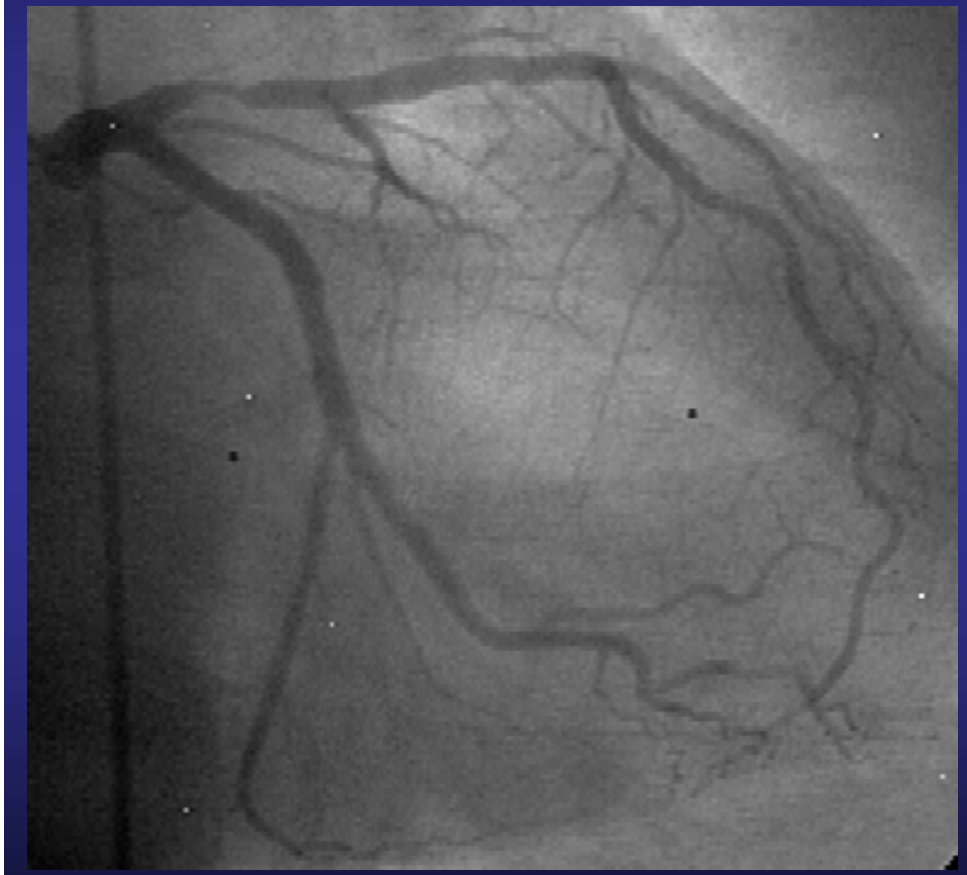
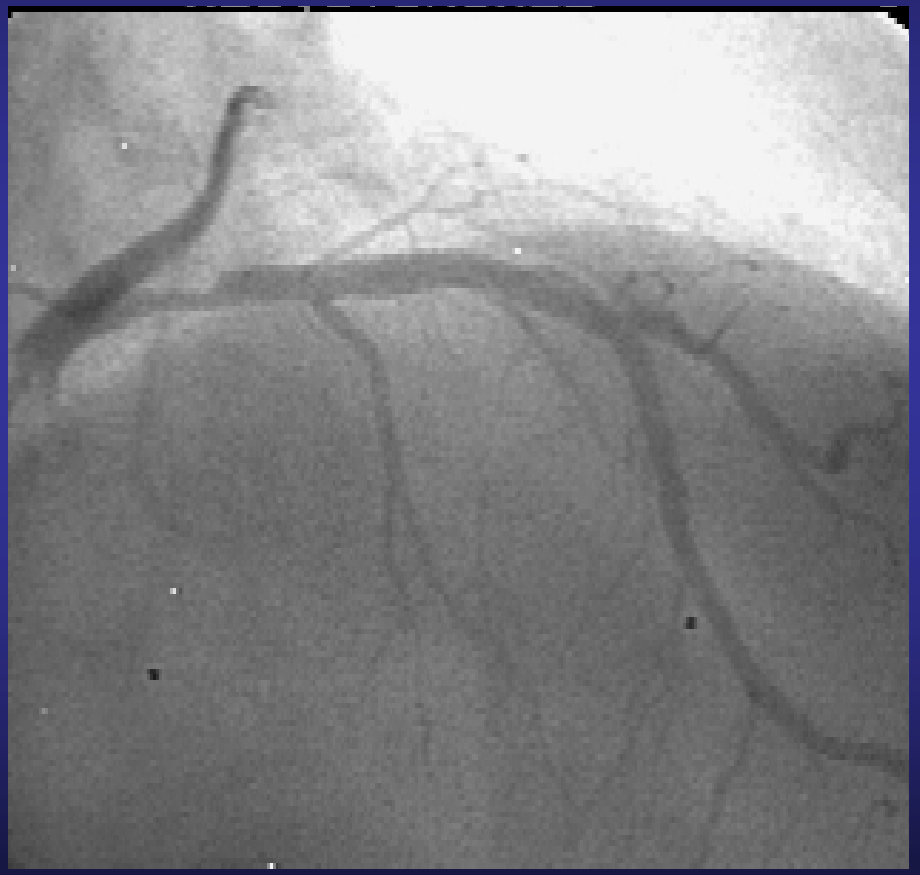


Patients who do not have treated diabetes with asymptomatic ischemia or mild angina with 1 or more significant lesions in 1 or 2 coronary arteries suitable for PCI with a high likelihood of success and a low risk of morbidity and mortality. The vessels to be dilated must subtend a large area of viable myocardium.

The same clinical and anatomic requirements for Class I, except the myocardial area at risk is of moderate size or the patients has treated diabetes.

Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina





Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina

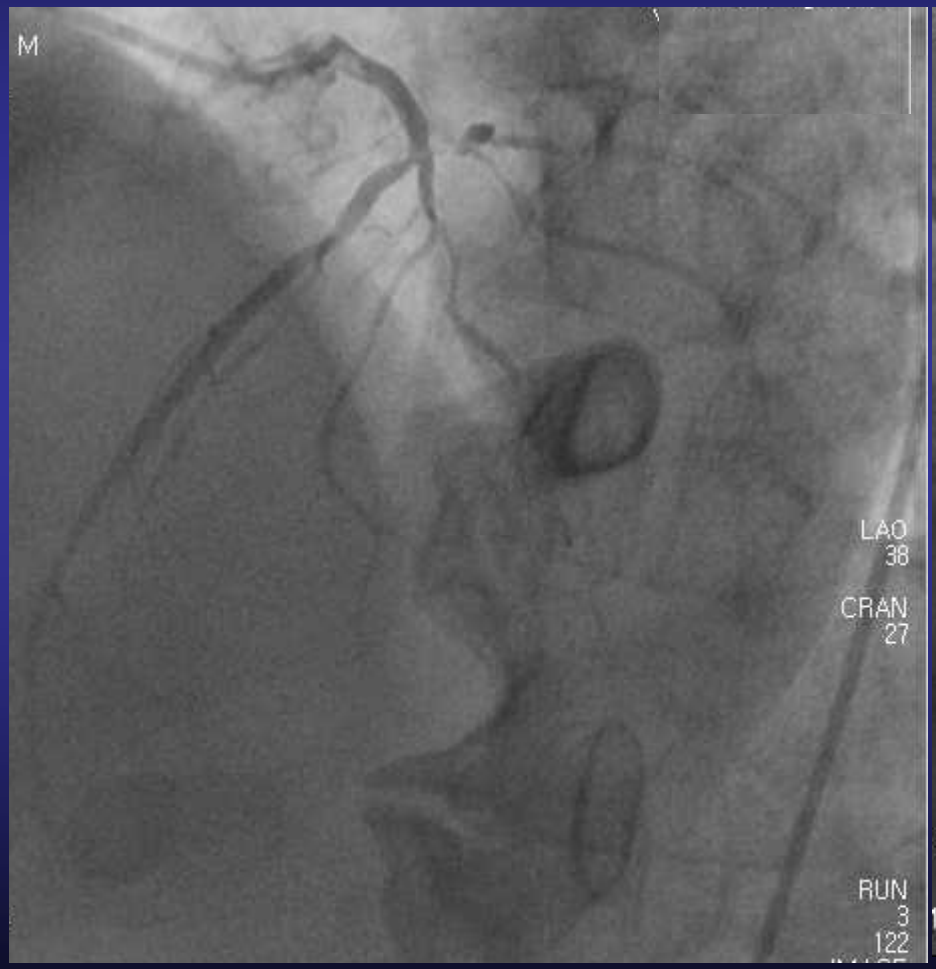
PCI is reasonable in patients with asymptomatic ischemia or CCS class I or II angina and with 1 or more significant lesions in 1 or 2 coronary arteries suitable for PCI with a high likelihood of success and a low risk of morbidity and mortality. The vessels to be dilated must subtend a moderate to large area of viable myocardium or be associated with a moderate to severe degree of ischemia on noninvasive testing.

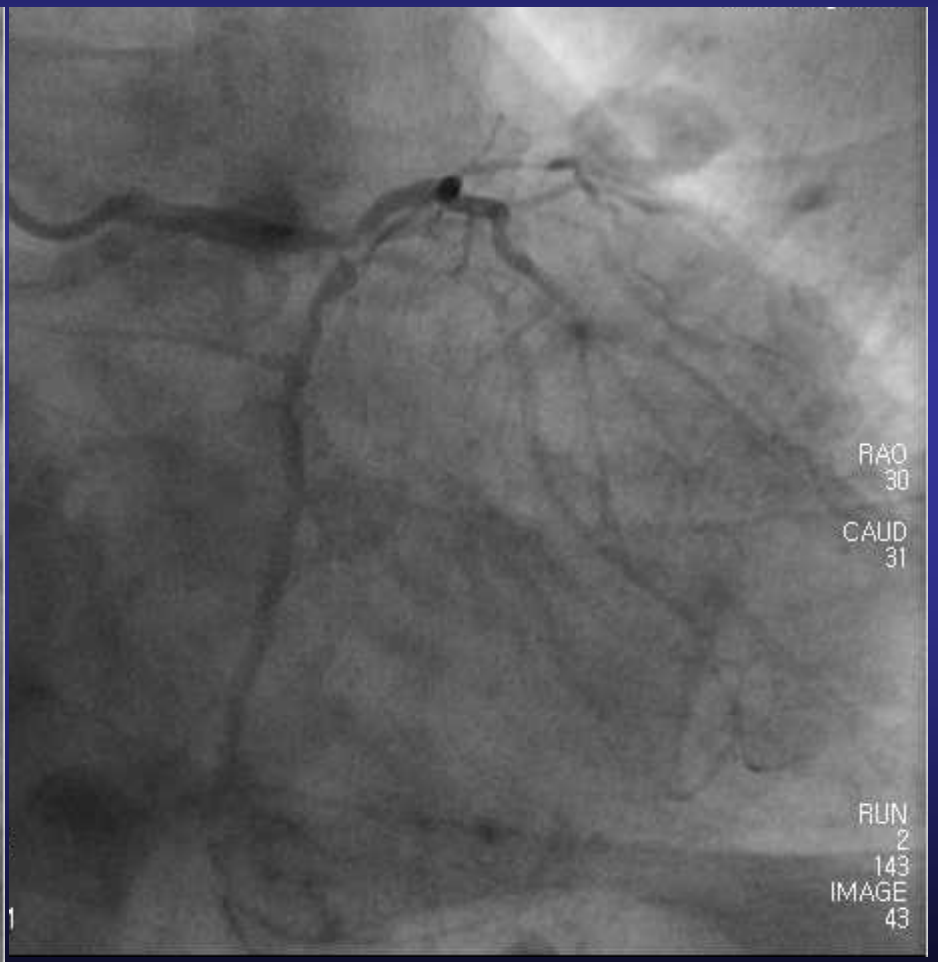
Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina

PCI is not recommended in patients who have 1 or more of the following:

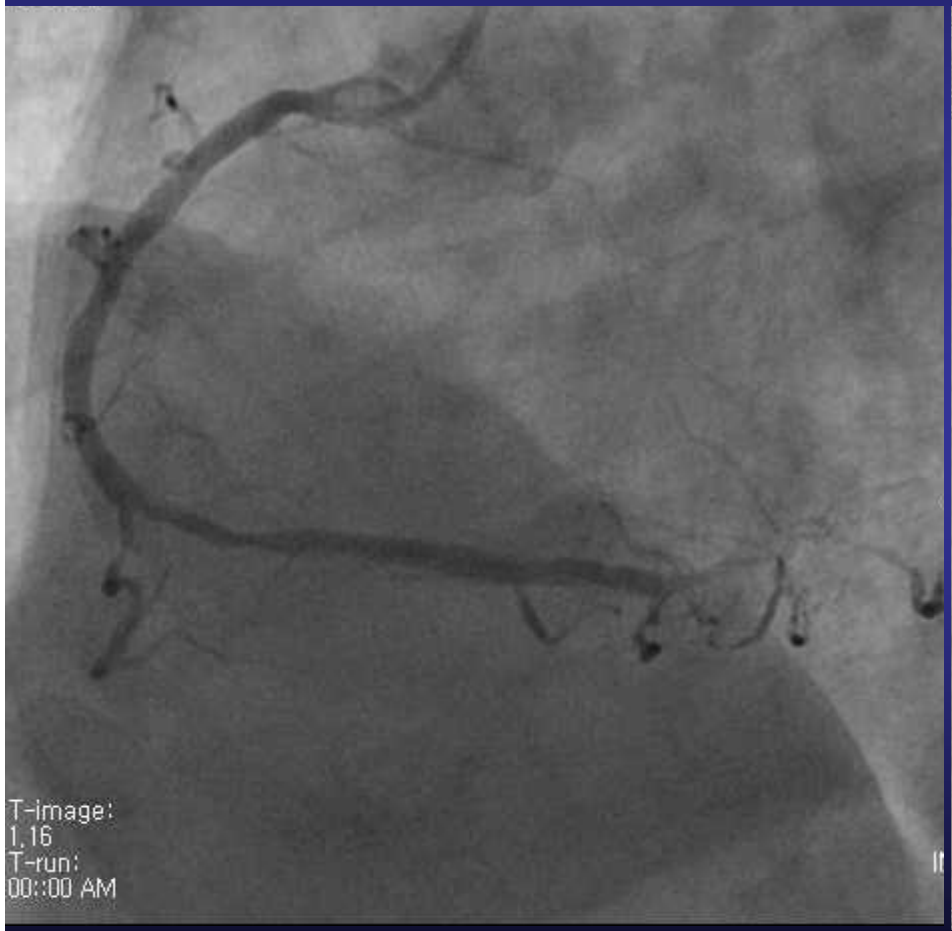
a. only a small area of viable myocardium at risk
b. no objective evidence of ischemia
c. lesions that have a low likelihood of successful dilatation
d. mild symptoms that are unlikely to be due to myocardial ischemia
e. factors associated with increased risk of morbidity or mortality
f. left main disease and eligibility for CABG
g. insignificant disease

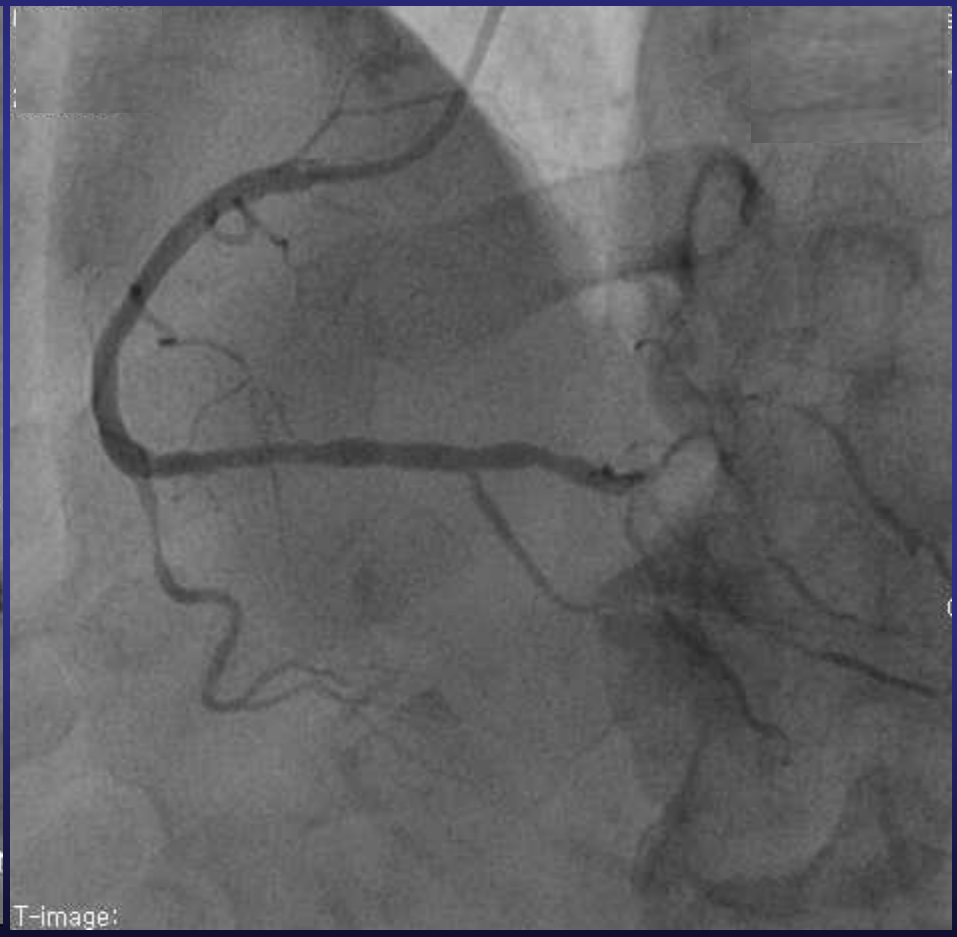
Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina





Patients with Asymptomatic Ischemia or Canadian Cardiovascular Society (CCS) Class I or II Angina





Patients with Canadian Cardiovascular Society (CCS) Class III Angina

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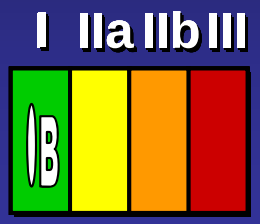
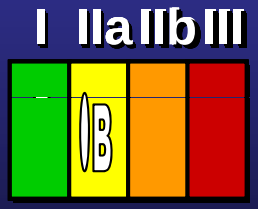
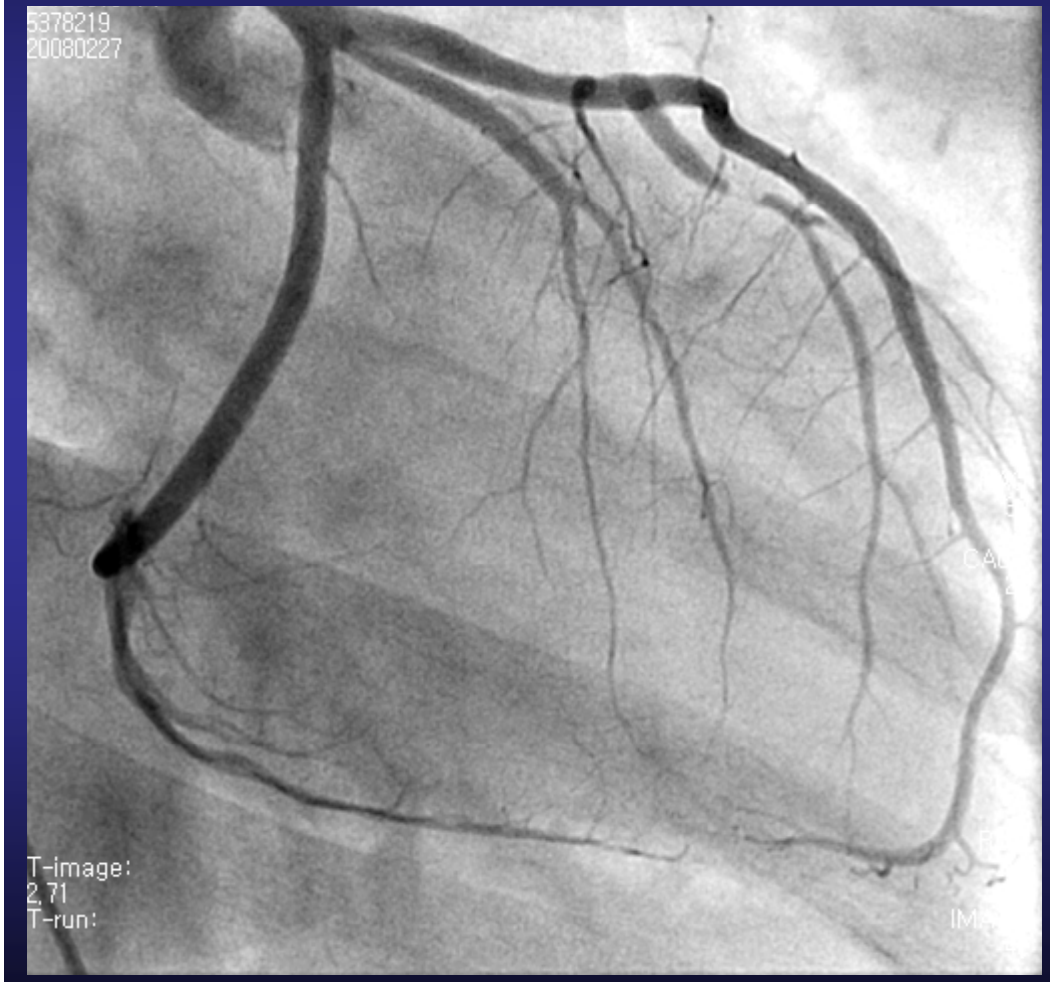


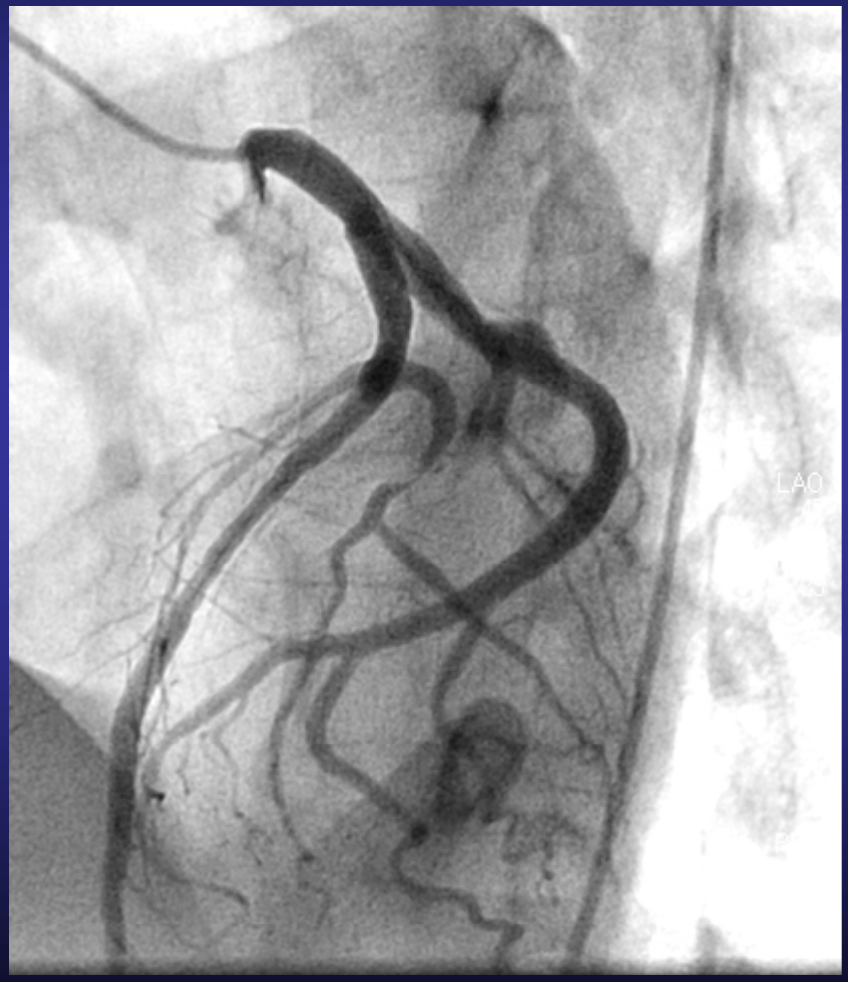
Patients with 1 or more significant lesions in 1 or more coronary arteries suitable for PCI with a high likelihood of success and low risk of morbidity or mortality. The vessels to be dilated must subtend a moderate or large area of viable myocardium and have high risk.



It is reasonable that PCI be performed in patients with CCS class III angina and single-vessel or multiple CAD who are undergoing medical therapy and who have 1 or more significant lesions in 1 or more coronary arteries suitable for PCI with a high likelihood of success and low risk of morbidity or mortality.

Patients with Canadian Cardiovascular Society (CCS) Class III Angina





Patients with Canadian Cardiovascular Society (CCS) Class III Angina

Use of PCI is reasonable in patients with CCS class III angina with significant left main CAD who are candidates for revascularization but are not eligible for CABG.

PCI may be considered in patients with CCS class III angina and no evidence of ischemia on noninvasive testing or who are undergoing medical therapy and have 2- or 3-vessel CAD with significant proximal LAD CAD and treated diabetes or abnormal LV function.

Patients with Canadian Cardiovascular Society (CCS) Class III Angina

PCI is not recommended for patients with CCS class III angina with single-vessel or mutivessel CAD, no evidence of myocardial injury or ischemia on objective testing, and no trial of medical therapy, or who have 1 of the following:

a. only a small area of myocardium at risk
b. all lesions or the culprit lesion to be dilated with morphology that conveys a low likelihood of success
c. a high risk of procedure-related morbidity or mortality
d. insignificant disease (less than 50% coronary stenosis)
e. significant left main CAD and candidancy for CABG

Patients with Unstable Angina/Non-ST-Elevation Myocardial Infarction (UA/NSTEMI)

Initial Conservative Versus Initial Invasive Strategies (UA/NSTEMI)

An early invasive PCI strategy is indicated for patients with UA/NSTEMI who have no serious comorbidity and who have coronary lesions amenable to PCI and who have characteristics for invasive therapy.

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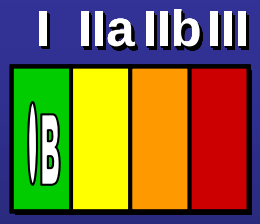
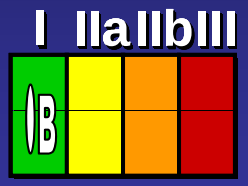


An early invasive strategy (i.e., diagnostic angiography with intent to perform revascularization) is indicated in UA/NSTEMI patients who have refractory angina or hemodynamic or electrical instability (without serious comorbidities or contraindications to such procedures).

NEW

Initial Conservative Versus Initial Invasive Strategies (UA/NSTEMI)



PCI (or CABG) is recommended for UA/NSTEMI patients with:

a.) 1- or 2-vessel CAD with or without significant proximal LAD CAD but with a large area of viable myocardium and high-risk criteria on noninvasive testing. ***NEW***

b.) Multi-vessel coronary disease with suitable coronary anatomy, with normal LV function, and without diabetes mellitus. ***NEW***

c.) An intravenous platelet GP IIb/IIIa inhibitor is useful in UA/NSTEMI patients undergoing PCI. ***NEW***

Initial Conservative Versus Initial Invasive Strategies (UA/NSTEMI)

PCI (or CABG) can be beneficial compared with medical therapy for UA/NSTEMI patients with 1-vessel disease with significant proximal left anterior descending CAD.

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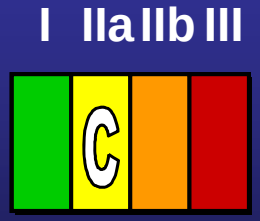


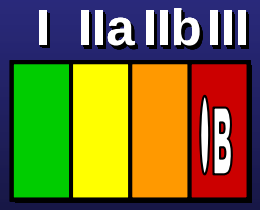
PCI is reasonable for focal saphenous vein graft lesions or multiple stenoses in UA/NSTEMI patients who are undergoing medical therapy and who are poor candidates for reoperative surgery.

MODIFIED

Initial Conservative Versus Initial Invasive Strategies (UA/NSTEMI)

In the absence of high risk features associated with UA/NSTEMI, PCI is not recommended for patients with UA/NSTEMI who have single-vessel or multi-vessel CAD and no trial of medical therapy, or who have 1 or more of the following:

a. only a small are of myocardium at risk.
b. all lesions or the culprit lesion to be dilated with morphology that conveys a low likelihood of success.
c. a high risk of procedure-related morbidity or mortality.
d. insignificant disease (less than 50% coronary stenosis).



e. significant left main CAD and candidacy for CABG.

Selection of Initial Treatment Strategy: Invasive vs. Conservative

Preferred Strategy	Patient Characteristics
Invasive	Recurrent angina or ischemia at rest or with low-level activities despite intensive medical therapy
	Elevated cardiac biomarkers (TnT or TnI)
	New or presumably new ST-segment depression
	Signs or symptoms of HF or new or worsening mitral regurgitation
	High-risk findings from noninvasive testing
	Hemodynamic instability
	Sustained ventricular tachycardia
	PCI within 6 months
	Prior CABG
	High-risk score (e.g., TIMI, GRACE)
	Reduced LV function (LVEF less than 40%)
Conservative	Low-risk score (e.g., TIMI, GRACE)
	Patient or physician preference in absence of high-risk features

Anderson JL, et al. J Am Coll Cardiol, 2007; 50:e1-157. Table 11.

Noninvasive Risk Stratification

High Risk (greater than 3% annual mortality rate)

- Severe resting LV dysfunction (LVEF less than 35%)
- High-risk treadmill score (score –11 or less)
- Severe exercise LV dysfunction (exercise LVEF less than 35%)
- Stress-induced large perfusion defect (particularly if anterior)
- Stress-induced multiple perfusion defects of moderate size
- Large, fixed perfusion defect with LV dilation or increased lung uptake (thallium-201)
- Stress-induced moderate perfusion defect with LV dilation or increased lung uptake (thallium-201)
- Echocardiographic wall-motion abnormality (involving more than 2 segments) developing with low dose of dobutamine (10 mg/kg per min or less) or at a low heart rate (less than 120 bpm)
- Stress echocardiographic evidence of extensive ischemia

King SB III, Smith SC Jr., et al. *J Am Coll Cardiol* 2008;51:172-209.

Noninvasive Risk Stratification

Intermediate Risk (1% to 3% annual mortality rate)

- Mild/moderate resting LV dysfunction (LVEF 35% to 49%)
- Intermediate-risk treadmill score (–11 to 5)
- Stress-induced moderate perfusion defect without LV dilation or increased lung intake (thallium-201)
- Limited stress echocardiographic ischemia with a wall-motion abnormality only at higher doses of dobutamine involving less than or equal to 2 segments

Low risk (less than 1% annual mortality rate)

- Low-risk treadmill score (score 5 or greater)
- Normal or small myocardial perfusion defect at rest or with stress*
- Normal stress echocardiographic wall motion or no change of limited resting wall-motion abnormalities during stress*

* Although published data are limited, patients with these findings will probably not be at low risk in the presence of either a high-risk treadmill score or severe resting LV dysfunction (LVEF less than 0.35).

King SB III, Smith SC Jr., et al. *J Am Coll Cardiol* 2008;51:172-209.

Indications for Chronic Kidney Disease

Creatinine clearance should be estimated in UA/NSTEMI patients, and the doses of renally cleared drugs should be adjusted appropriately.

NEW

In chronic kidney disease patients undergoing angiography, isosmolar contrast agents are indicated and are preferred.

NEW

PCI After Successful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

PCI After Successful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

In patients whose anatomy is suitable, PCI should be performed:

when there is objective evidence of recurrent MI.

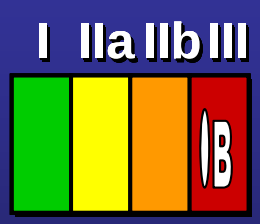
for moderate or severe spontaneous or provocable myocardial ischemia during recovery from STEMI.

for cardiogenic shock or hemodynamic instability.

PCI After Successful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

MODIFIED

PCI of a hemodynamically significant stenosis in a patent infarcted artery greater than 24 hours after STEMI may be considered as part of an invasive strategy.



NEW

PCI of a totally occluded infarct artery greater than 24 hours after STEMI is not recommended in asymptomatic patients with 1- or 2-vessel disease if they are hemodynamically and electrically stable and do not have evidence of severe ischemia.

Ancillary Therapy

Anticoagulants as Ancillary Therapy

For patients undergoing PCI after having received an anticoagulant, the following dosing recommendations should be followed:

For prior treatment with:

a. UFH - administer additional boluses of UFH as needed to support the procedure, taking into account whether GP IIb/IIIa receptor antagonists have been administered. NEW

Bivalirudin may also be used in patients treated previously with UFH.

b. Enoxaparin –if the last subcutaneous dose was administered 8 to 12 hours earlier, an IV dose of 0.3 mg per kg should be given; if the last subcutaneous dose was administered within the prior 8 hours, no additional enoxaparin should be given. NEW

c. Fondaparinux – administer additional IV treatment with an anticoagulant possessing anti-IIa activity, taking into account whether GP IIb/IIIa receptor antagonists have been administered. NEW

Because of the risk of catheter thrombosis, fondaparinux should not be used as the sole anticoagulant to support PCI. An additional anticoagulant with anti-IIa activity should be administered. NEW

Antiplatelet Therapy

Antiplatelet Therapy(aspirin)

Patients already taking daily long-term aspirin should take 75 mg to 325 mg before PCI is performed.

Patients not already taking daily aspirin should be given 300 mg to 325 mg of aspirin at least 2 hours and preferably 24 hours before PCI is performed.

MODIFIED

After PCI, in patients without allergy or increased risk of bleeding, aspirin 162 mg to 325 mg daily should be given for at least 1 month after BMS, 3 months after sirolimus-eluting stent, 6 months after paclitaxel-eluting stent, after which daily long-term aspirin use should be continued indefinitely at a dose of 75 mg to 162 mg.

Antiplatelet Therapy(clopidogrel)

A loading dose of clopidogrel, generally 600 mg, should be administered before or when PCI is performed.

MODIFIED

In patients undergoing PCI within 12 to 24 hours of receiving fibrinolytic therapy, a clopidogrel oral loading dose of 300 mg may be considered.

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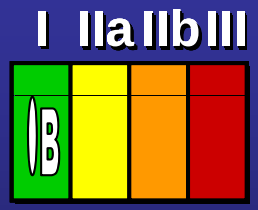

For all post-PCI stented patients receiving a DES, clopidogrel 75 mg daily should be given for at least 12 months if not at high risk of bleeding.

MODIFIED

For post-PCI patients receiving BMS, clopidogrel should be given for a minimum of 1 month and ideally up to 12 months (unless at increased risk of bleeding; then it should be given for two weeks).

MODIFIED

Antiplatelet Therapy

If clopidogrel is given at the time of procedure, supplementation with GP IIb/IIIa receptor antagonists can be beneficial.

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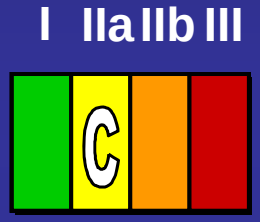
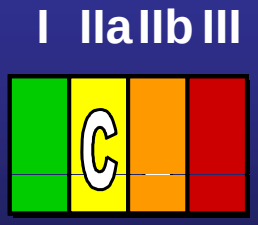
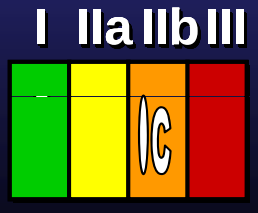


For patients with an absolute contraindication to aspirin, it is reasonable to give a 300 mg to 600 mg loading dose of clopidogrel, administered at least 6 hours before PCI, and/or GP IIb/IIIa antagonists at the time of PCI.



In patients for whom the physician is concerned about risk of bleeding, a lower dose of 75 mg to 162 mg of aspirin is reasonable during the initial period after stent implantation.

NEW



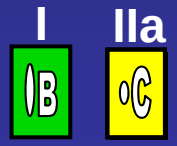
Continuation of clopidogrel therapy beyond 1 year may be considered in patients undergoing DES placement.

NEW

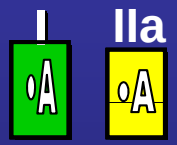
Secondary Prevention and Long-Term Management

Secondary Prevention

- Ask, advise, assess, and assist patients to stop smoking –



- Clopidogrel 75 mg daily:
  - PCI – I (B)
  - no PCI – IIa (C)



- Statin goal:
  - LDL-C < 100 mg/dL – I (A)
  - consider LDL-C < 70 mg/dL – IIa (A)

- Daily physical activity 30 min 7 d/wk, minimum 5 d/wk – I (B)

- Annual influenza immunization – I (B)

Secondary Prevention and Long Term Management

Goals

Diabetes management:
Goal:
HbA1c < 7%

Class I Recommendations

I B

- It is recommended to initiate lifestyle and pharmacotherapy to achieve near-normal HbA1c. MODIFIED

I B

- Beginning vigorous modification of other risk factors (e.g., physical activity, weight management, BP control, and cholesterol management as recommended above) is beneficial. MODIFIED

I C

- Coordination of diabetic care with patient's primary care physician or endocrinologist is beneficial. NEW

Secondary Prevention and Long Term Management

Goals

Renin-Angiotensin-Aldosterone System Blockers: ACE Inhibitors

Recommendations

I A

- ACE inhibitors should be started and continued indefinitely in all patients with LVEF ≤ 40% and for those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. MODIFIED

I B

- ACE inhibitors should be started and continued indefinitely in patients who are not lower risk (lower risk defined as those with normal LVEF in whom cardiovascular risk factors are well controlled and revascularization has been performed), unless contraindicated. MODIFIED

IIa B

- Among lower risk patients (i.e., those with normal LVEF in whom cardiovascular risk factors are well controlled and revascularization has been performed) use of ACE inhibitors is reasonable. MODIFIED

Secondary Prevention and Long Term Management

Goals

Class I Recommendations

Beta-Blockers

I
A

- It is beneficial to start and continue beta-blocker therapy indefinitely in all patients who have had MI, acute coronary syndrome, or left ventricular dysfunction with or without HF symptoms, unless contraindicated.

IIa
C

- It is reasonable to consider long-term therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated.

MODIFIED RECS

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2008년 9월 26, 27