# PCI and STEMI Guidelines: Latest Evidence, Updates and Systems of Care for STEMI

A focused update of the guidelines for the management of patients with ST-elevation myocardial infarction (STEMI) and for percutaneous coronary intervention (PCI) was released in November 2009 by the American Heart Association and the American College of Cardiology [Kushner FG et al. Published online 18 November 2009 in *Circulation* and *JACC*].

The 2009 Focused Update contains both new and modified recommendations that are based on late-breaking clinical trial data from the past two years. The recommendations are organized into three classes and three levels of evidence. A Class I recommendation indicates a procedure/treatment that **should** be performed. Class II reflects procedures/treatments that are *reasonable to perform* (Class IIa) or that *may be considered* (Class IIb). Procedures/treatments that **should not** be performed are considered Class III. Levels of evidence (LOE) are based on the size of the population in which the treatment/procedure has been evaluated and the source of the data. Class A LOE reflects data from a large population sample and multiple randomized controlled trials. Data from limited populations and only one randomized or multiple nonrandomized trials are considered Class B. Class C recommendations are derived from very limited populations and are based on a consensus of expert opinion case studies or standard of care.

## ST-Elevation Myocardial Infarction (STEMI)

### Modified Recommendations

*Glycoprotein IIb/IIIa Receptor Antagonists*

1. Treatment with glycoprotein IIb/IIIa receptor antagonists may be started at the time of primary PCI (with/without stenting) in selected patients with STEMI: abciximab (Class IIa, LOE: A) OR tirofiban or eptifibatide (Class IIa, LOE: B).
2. The usefulness of glycoprotein IIb/IIIa receptor antagonists as part of a preparatory pharmacological strategy for patients with STEMI before their arrival in the cardiac catheterization laboratory for angiography and PCI is uncertain (Class IIb, LOE: B).

*Thienopyridines*

1. A loading dose of thienopyridine is recommended for STEMI patients for whom PCI is planned: at least 300-600 mg of clopidogrel as early as possible before or at the time of primary or nonprimary PCI [Class I, LOE: C] OR prasugrel 60 mg as soon as possible for primary PCI (Class I, LOE: B).
2. Patients who receive a bare metal (BMS) or drug-eluting (DES) stent during PCI for acute coronary syndrome should be given clopidogrel 75 mg daily (Class I, LOE: B) or prasugrel 10 mg daily (Class I, LOE: B) for at least 12 months. If the risk of morbidity due to bleeding outweighs the anticipated benefit that is afforded by thienopyridine therapy, earlier discontinuation should be considered (Class I, LOE: C).

**New Recommendations**

*Thienopyridines*

1. Prasugrel is not recommended as part of a dual antiplatelet therapy regimen in STEMI patients with a prior history of stroke and transient ischemic attack for whom primary PCI is planned (Class III, LOE: C).
2. Intensive glucose control.
3. It is reasonable to use an insulin-based regimen to achieve and maintain glucose levels <180 mg/dL while avoiding hypoglycemia for patients with STEMI with either a complicated or uncomplicated course (Class I, LOE: B).
4. Stents.
5. A DES may be used as an alternative to a BMS for primary PCI in STEMI (Class IIa, LOE: B).
6. A DES may be considered for clinical and anatomical settings in which the efficacy/safety profile appears favorable (Class IIb, LOE: B).

**Percutaneous Coronary Intervention**

**Modified Recommendations**

*Angiography in Patients with Chronic Kidney Disease (CKD)*

1. Appropriate contrast agents during angiography or PCI in patients with CKD now include both isosmolar (Class I, LOE: A) and a low-molecular-weight contrast medium other than ioxaglate or iohexol (Class I, LOE: B).
2. Fractional flow reserve (FFR).
3. It is reasonable to use FFR (Class IIa, LOE: A) or Doppler velocimetry (Class IIa, LOE: C) to assess the effects of intermediate coronary stenoses (30% to 70% luminal narrowing) in patients with anginal symptoms.
4. Routine assessment with FFR or Doppler ultrasonography to assess angiographic disease severity in concordant vascular distribution in patients with angina and a positive, unequivocal noninvasive functional study is not recommended (Class III, LOE: C).

**New Recommendations**

*PCI for Unprotected Left Main Coronary Artery Disease*

1. PCI of the left main coronary artery using stents as an alternative to coronary artery bypass graft (CABG) may be considered in patients with anatomical conditions that are associated with low risk of PCI procedural complications and clinical conditions that predict an increased risk of adverse surgical outcomes (Class IIb, LOE: B).
2. Timing of angiography and antiplatelet therapy in UA/NSTEMI.
3. Patients with definite or likely unstable angina/non-ST-elevation myocardial infarction (UA/NSTEMI) who are selected for an invasive approach should receive dual antiplatelet therapy (Class I, LOE: A). Aspirin should be initiated on presentation (Class I, LOE: A). Either clopidogrel (before or at the time of PCI) (Class I, LOE: A) OR prasugrel (at the time of PCI) (Class I, LOE: B) is recommended as a second antiplatelet agent.

It is reasonable for initially stabilized high-risk patients with UA/NSTEMI Global Registry of Acute Coronary Events (GRACE) score >140 to undergo an early invasive strategy within 12 to 24 hours of admission. For patients who are not at high risk, an early invasive approach is also reasonable (Class IIa, LOE: B).

**Additional reading:**

Kushner FG et al. Published online 18 November 2009 in *Circulation* and *JACC*.

## HRT Does Not Protect Against or Improve Survival in Postmenopausal Women Who Develop HF

Over the last 30 years, the incidence of heart failure (HF) has increased in women by about 10% [Levy D et al. *N Engl J Med* 2002; Roger VL et al. *JAMA* 2004], and although survival has improved in women, it has not done so to the same degree as in men [Barker WH et al. *Circulation* 2006]. Although some studies have suggested a beneficial effect on HF survival from hormone therapy [Lindenfeld J et al. *J Am Coll Cardiol* 2003; Reis SE et al. *J Am Coll Cardiol* 2000], others have not seen this relationship [Bibbins-Domingo K et al. *Am J Cardiol* 2005].

Liviu Klein, MD, MS, Northwestern University, Feinberg School of Medicine, Chicago, IL, presented the results of a study that compared the effect of hormone therapy on the incidence of HF and HF survival in postmenopausal women aged 50 to 79 years (~81% white) who were participants in the Women's Health Initiative (WHI) Hormone Therapy Trials. Subjects in this study were randomly assigned to receive 0.625 mg daily of conjugated