



**Figure 2.** The 4-year predicted likelihood that a patient will develop hypertension. Blood pressure was 120/80 mm Hg, unless otherwise indicated. The plus and minus signs below the graph indicate the presence or absence of risk factors. \*Both parents with hypertension. BMI, body mass index; DBP, diastolic blood pressure; SBP, systolic blood pressure. Reproduced with permission of American College of Physicians from *Annals of Internal Medicine*. Parikh NI et al. A risk score for predicting near-term incidence of hypertension: the Framingham Heart Study. Volume 148. Copyright © 2008<sup>1</sup>; permission conveyed through Copyright Clearance Center, Inc.

## Percutaneous Coronary Intervention

### Significance of Troponin Bump in PCI and Safety of Warfarin With Dual Antiplatelet Therapy

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[*Rev Cardiovasc Med*. 2009;10(3):178-179  
doi: 10.3909/ricm0508B]

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#### Prognostic Significance of Small Troponin I Rise After a Successful Elective Percutaneous Coronary Intervention of a Native Artery

De Labriolle A, Lemesle G, Bonello L, et al.

*Am J Cardiol*. 2009;103:639-645.

Efforts are underway to establish elevated troponin following percutaneous coronary intervention (PCI) as one of the national quality benchmarks for those who perform these studies. This would mandate routine assessment of troponin in all patients undergoing PCI. There has yet to be established a clear relationship between small troponin elevation in patients undergoing elective PCI and the quality of the PCI, and therefore this assessment has not been validated. A task force including the European Society of Cardiology, American Heart Association, American College of Cardiology Foundation, and World Heart Federation, has developed a “universal” definition of myocardial infarction (MI), including PCI-related MI, to be any increase greater than 3 times the 99th percentile of a normal reference population.<sup>2</sup>

De Labriolle and colleagues<sup>3</sup> evaluated a total of 3200 consecutive patients undergoing successful PCI at their institution between 2003 and 2006. Of these patients, 1402 (43.8%) had an elevation of troponin greater than the 97.5th percentile (mean 0.32 ng/mL, range 0.01-4.94), and 751 patients (23.4%) had a troponin I level greater than 0.30 ng/dL. The investigators used a cutoff troponin level of greater than 0.30 ng/mL to indicate a troponin level representing an MI, as per the above task force recommendation.

Troponin elevations in this analysis were associated with the number of diseased arteries, the number of narrowings treated, the number of stents implanted, the increased complexity of the stenosis treated, the stent length, and the use of rotational atherectomy. There was no relationship between troponin elevations and the probability of death or Q wave MI within 1 year. Therefore, it would seem that the use of troponin elevation post elective PCI as an independent marker of a future major cardiac adverse event is not supported by clinical data. It does seem to be associated with the treatment of more complex coronary artery disease. Therefore, the use of troponin assessment after elective PCI as a quality indicator is not founded and should not be considered a PCI quality benchmark.

### Long-Term Outcomes in Patients Undergoing Coronary Stenting on Dual Oral Antiplatelet Treatment Requiring Oral Anticoagulant Therapy

Rossini R, Musumeci G, Lettieri C, et al.

*Am J Cardiol.* 2008;102:1618-1623.

A common clinical conundrum is the management of patients who present with an acute coronary syndrome and/or who undergo coronary stent placement with a need for dual antiplatelet therapy, who also receive oral anticoagulant therapy for conditions such as atrial fibrillation, deep venous thrombosis, or mechanical valve prosthesis. The major concern in these patients is the risk of hemorrhagic complications.<sup>4</sup> In this single-center study, Rossini and colleagues<sup>5</sup> studied bleeding risk in 102 patients undergoing PCI who were placed on dual antiplatelet therapy on top of background use of warfarin to achieve a goal international normalized ratio (INR) of 2.0 to 2.5 in comparison with a control group of 102 patients who received dual antiplatelet therapy and did not require warfarin. Patients requiring warfarin for a prosthetic valve were excluded from this study. The mean duration of triple therapy was 157 days, with follow-up for 18 months.

At 18 months, there was a strong trend toward an increase in bleeding risk in those patients receiving triple therapy versus those receiving dual antiplatelet therapy (10.8% vs 4.9%;  $P = .1$ ). Interestingly, in those patients who had INRs in the targeted range, the risk of bleeding was much lower than in those with an INR exceeding 2.5 (4.9% vs 33%;  $P = .00019$ ). There was no significant difference in major cardiac adverse events.

In summary, this analysis suggests that in patients who require triple therapy (exclusive of those with prosthetic heart valves), targeting a lower INR in the range of 2.0 to 2.5 may be prudent to reduce hemorrhagic complications without compromising clinical efficacy. Before this goal can be considered an official recommendation, it must be studied in a randomized, multicenter clinical trial. ■

## Acute Coronary Syndromes

### The Interaction of Proton Pump Inhibitors and Clopidogrel

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[*Rev Cardiovasc Med.* 2009;10(3):179-180  
doi: 10.3909/ricm0508C]

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### Risk of Adverse Outcomes Associated With Concomitant Use of Clopidogrel and Proton Pump Inhibitors Following Acute Coronary Syndrome

Ho PM, Maddox TM, Wang L, et al.

*JAMA.* 2009;301:937-944.

Ho and colleagues<sup>6</sup> reported on a relationship between the use of proton pump inhibitors (PPI) plus clopidogrel and the risk of rehospitalization and recurrent coronary revascularization in patients presenting with acute coronary syndromes (ACS). Data from this study are important because PPIs are known to reduce the platelet inhibitory effects of clopidogrel. The interaction between the PPI omeprazole and clopidogrel is based on competitive and noncompetitive inhibitory mechanisms on cytochrome P450 2C19 (CYP2C19). This pathway is responsible for the metabolism of clopidogrel, which is a prodrug, to its active form. No prospective randomized clinical trial data have confirmed that this