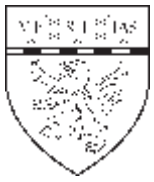
Harvard Medical School Department of Continuing Education and the Cardiovascular Division of the Department of Medicine, Brigham and Women's Hospital



Cardiology Rounds
June/July 2004

Intracoronary Vascular Profiling of Shear Stress, Lumen, and Wall Morphology to Predict Vascular Behavior and Atherosclerosis Progression
Part 2: Clinical Implications

By Peter H. Stone, M.D., and Charles L. Feldman, Sc.D.

Objectives:

In this two-part presentation of *Cardiology Rounds*, the authors discuss the role of intracoronary endothelial shear stress – ie, the rubbing force exerted by blood flow on the endothelial monolayer that lines the coronary arteries – in the development and progression of coronary artery disease. Part 1 of this topic reviewed the role of coronary endothelium as the modulator of CAD pathogenesis and the molecular biology underlying the adverse effects of low intracoronary shear stress. In Part 2, readers will gain an understanding of:

- how shear stress influences atherogenesis and coronary artery remodeling
- vascular profiling methodology that now allows for routine in-vivo measurements of intracoronary hemodynamics and intracoronary shear stress, and arterial wall morphology in man
- the results of the authors' pilot study of serial investigations of minimally-diseased coronary arteries in patients, studied 6 months apart; in this study, areas of plaque progression and arterial remodeling at the follow-up study were predicted based on the intracoronary hemodynamics present at the index study
- how application of this methodology may allow early identification of portions of the coronary arteries that are destined to become high risk for causing a clinical events; early identification of high risk coronary lesions may lead to pre-emptive therapeutic strategies.

Test:

1. Today, most minor stenoses detected during angiography are stented because they might evolve into vulnerable plaques:

   True ❑ False ❑

2. Two planes of coronary angiography are necessary to reconstruct the coronary artery lumen and external elastic membrane (EEM) in anatomically correct 3D space.

   True ❑ False ❑

3. Blood viscosity, required to determine shear stress, depends primarily on hematocrit.

   True ❑ False ❑

4. Coronary blood flow, blood viscosity, and lumen diameter are necessary and sufficient to determine shear stress at each point within a coronary artery.

   True ❑ False ❑

5. Within 6 months, minimally diseased coronary arteries exposed to low shear stress show increased plaque volume and increased EEM diameter.

   True ❑ False ❑

6. Within 6 months, minimally diseased coronary arteries exposed to high shear stress show outward remodeling without increased plaque volume.

   True ❑ False ❑

7. Within 6 months, restenosis of coronary arteries stented with bare metal stents strongly depends on shear stress within the stent.

   True ❑ False ❑

To receive AMA category 1 credit, you must correctly answer 60% of the test questions.

Harvard Medical School is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Harvard Medical School designates this educational activity for a maximum of 1 category 1 credit toward the AMA Physician's Recognition Award. Each physician should claim only those credits that he/she actually spent in the educational activity.

This program was issued in June/July 2004. All tests must be returned by October 31, 2004.

Please send the completed test and a check for $25 US. (Check made payable to: Harvard Medical School) to: Harvard Medical School/Department of Continuing Education, Box 825, Boston, MA 02117-825.

We will return your corrected test and a certificate upon successful completion.

Name _____

Address _____

Phone _____

Email _____

Fax _____