

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



Cardiology Rounds
April 2005

The Pleiotropic Effects of Statins: Fact or Fantasy?

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Objectives:

- To describe the potential mechanisms of lipid-dependent and lipid-independent effects of statin therapy on atherosclerosis
- To discuss the implications and limitations of the lipid-independent effects of statins and their potential clinical benefits

Questions: Only one response is correct.

1. The plaque regression trials have shown that statin therapy:
 - a. reduces plaque size by 50%-80%
 - b. reduces plaque to a greater extent in intravascular ultrasound (IVUS) trials than angiographic trials
 - c. highlights the importance of tight stenoses in causing cardiac events
 - d. decreases arterial lumen diameter or plaque by about 2%-3%
2. Intensive reduction of low-density lipoprotein (LDL) cholesterol by dietary or non-statin therapies:
 - a. has no effect on inflammation in animals with atherosclerosis
 - b. improves endothelial function in human studies
 - c. has few pleiotropic effects on vascular function
 - d. decreases collagen density in the plaque of animals with atherosclerosis
3. Pleiotropic effects of statins that may be LDL-independent include:
 - a. decreased high-density lipoprotein (HDL) cholesterol
 - b. decreased activation of nitric oxide synthase
 - c. reduction in isoprenoid-mediated pathways of inflammation
 - d. increases in oxidant stress
4. LDL-independent effects of statins in cell culture studies:
 - a. include activation of nitric oxide by inhibition of caveolin production
 - b. include interference of Rho pathways
 - c. may be modulated by LDL or oxidized LDL
 - d. all of the above

5. Blood cholesterol levels in humans are:
 - a. related to the extent of carotid atherosclerosis on non-invasive ultrasound
 - b. consistently related to hemorrhagic stroke
 - c. unrelated to the reduction in stroke risk in patients on statin therapy
 - d. unrelated to the risk of ischemic stroke (infarction/embolic stroke)

6. Meta-analysis of major statin randomized controlled trials have shown a relationship between the degree of LDL lowering and:
 - a. reduction in coronary heart disease risk
 - b. development of diabetes
 - c. incidence of cancer
 - d. incidence of rhabdomyolysis

7. Pleiotropic, LDL-independent effects of statins:
 - a. are necessary for their benefit in humans
 - b. may help us discover new therapies that have adjunctive benefits to statins
 - c. are proven in clinical trials by statistical modeling
 - d. are only theoretical at this stage

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

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