

News and Views From the Literature

Computed Tomography

Computed Tomography Screening for Coronary Artery Calcium in Asymptomatic Individuals

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Comparative Effectiveness and Cost-Effectiveness of Computed Tomography Screening for Coronary Artery Calcium in Asymptomatic Individuals

Van Kempen BJ, Spronk S, Koller MT, et al.

J Am Coll Cardiol. 2011;58:1690-1701.

In this analysis from the Rotterdam Study, the authors compared the effectiveness and cost-effectiveness of four different treatment strategies for patients at intermediate

risk for coronary heart disease (CHD): 1) **Current practice**, which typically depended on the discretion of the treating general practitioners without any additional preventive intervention; 2) **Current guidelines**, in which patients are treated to guideline recommendations for primary prevention with lifestyle modification, counseling, and the use of statin therapy when low-density lipoprotein cholesterol (LDL-C) exceeded 130 mg/dL; 3) **Computed tomography (CT) calcium screening**, in which a coronary calcium score (CCS) was obtained with recalculation of the Framingham Risk Score (FRS), taking into account the CCS; and 4) **Statin therapy** for all moderate-risk patients (Figure 1).

Individuals reclassified by CCS to low risk received statin therapy if their LDL-C was > 160 mg/dL; those reclassified to high risk received statin therapy irrespective of cholesterol levels, and those who remained classified as intermediate risk were treated as described in Figure 1. From 1997 onward, 2028 participants underwent CCS and were followed for a median of 9.2 years. The demographics of the men and women followed in this analysis are notable for the following: women were older than men and had higher mean systolic blood pressure but lower diastolic pressure, higher LDL-C levels, a greater prevalence of diabetes mellitus, and a greater prevalence of never having smoked. Baseline CCS appeared higher in men than women (Table 1).

Primary care physicians were blinded to the CCS findings. Two prediction models were used to combine the FRS

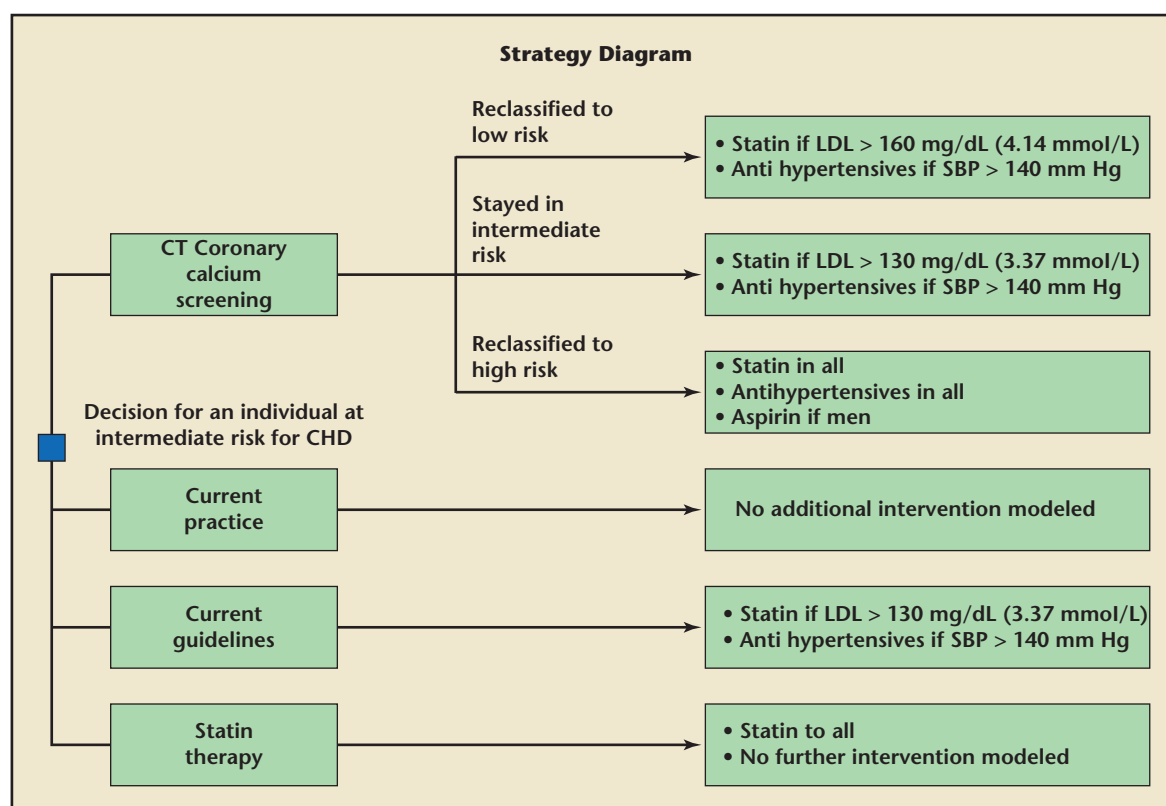


Figure 1. Schematic representation of the four alternative strategies modeled for an individual at intermediate risk for CHD: CT coronary calcium screening, current practice, current guidelines, and statin therapy. CHD, coronary heart disease; CT, computed tomography; LDL, low-density lipoprotein; SBP, systolic blood pressure. Reprinted from Van Kempen BJ et al. *J Am Coll Cardiol.* 2011;58:1690-1701; with permission from Cardiosource.

with the CCS findings to create the revised CHD relative risk assignment. One key finding of this study was that over 50% of patients had their CHD revised to low or high risk when the CCS was taken into account. Medication costs, using generic drug costs, were estimated to be \$160 per year for statins; event-related costs included prevailing local costs for hospitalization and interventions. Implementing the CT screening strategy (strategy #3) led to fewer statin users in men (68% vs 75%) and women (41% vs 87%) compared with current guidelines (strategy #2). Implementing current guidelines (strategy #2) led to much greater use of statins than current therapy by primary care physician (strategy #1) in men (12% to 75%) and in women (15% to 84%). In men, the strategy mandating the incorporation of CCS was the most effective approach for increasing life expectancy but less cost effective than statin-only treatment and more cost effective than using current guidelines. In women, CT screening was more

effective and more costly than current practice guidelines; however, current guideline strategy was more effective and less costly than a CT-guided approach.

The authors concluded that the benefit of CCS screening is obtained in those reclassified to the high-risk group who were treated more aggressively, by current guidelines, than they would have been as intermediate-risk patients. Because CCS led to fewer women being reclassified as high risk than men—presumably because of a lower incidence of coronary calcium in women—the potential benefit of CT screening may be lower. It is not possible to directly extrapolate the cost effectiveness data from the Rotterdam study to the United States, owing to the different cost associated with medical care. However, it is clear that an approach using CCS in men at intermediate risk for CHD is both clinically and cost effective. In women, a CCS approach is far more effective than current practice and facilitates targeted treatment. ■

Table 1
Baseline Characteristics of Study Population With Initial Risk of CHD Between 10% and 20%

Variable	Men (n = 329)	Women (n = 247)
Age (y)	70 (66-73)	74 (71-78)
Body mass index (kg/m ²)	26.5 (24.8-28.7)	28 (25-31)
Systolic blood pressure (mm Hg)	144 (131-155)	149 (135-161)
Diastolic blood pressure (mm Hg)	78 (70-85)	76 (69-82)
Total cholesterol (mg/dL) (mmol/L)	222 (201-240) (5.7 [5.2-6.2])	240 (217-232) (6.2 [5.6-6.8])
HDL cholesterol (mg/dL) (mmol/L)	46 (33-63) (1.2 [1.1-1.4])	50 (39-54) (1.3 [1.1-1.4])
LDL cholesterol (mg/dL) (mmol/L)	146 (124-165) (3.75 [2.42-5.1])	158 (135-178) (4.1 [2.63-5.62])
Cholesterol-lowering medication (%)	52 (15.8)	44 (17.8)
Antihypertensive medication (%)	87 (26.4)	117 (47.4)
Antithrombotic agents	97 (29.5)	43 (17.4)
Smokers		
Never (%)	29 (9)	124 (50)
Current (%)	70 (21)	33 (13)
Former (%)	230 (70)	90 (36)
Diabetes mellitus (%)	19 (5.8)	42 (17)
Calcium score (%)		
0 (%)	11 (3)	16 (7)
1-100 (%)	122 (37)	104 (42)
101-400 (%)	79 (24)	65 (26)
401-1000 (%)	64 (20)	37 (15)
> 1000 (%)	63 (16)	25 (10)

Values are mean (interquartile range) or n (%).

CHD, coronary heart disease; HDL, high-density lipoprotein; LDL, low-density lipoprotein.

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Drug-Eluting Stents

Evaluation of Second-Generation Drug-Eluting Stents

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Evaluation of the Second Generation of a Bioresorbable Everolimus-Eluting Vascular Scaffold for the Treatment of De Novo Coronary Artery Stenosis: 12-Month Clinical and Imaging Outcomes

Serruys PW, Onuma Y, Dudek D, et al.

J Am Coll Cardiol. 2011;58:1578-1588.

The development of bioresorbable stents is driven by the possibility of reducing the risk of late thrombosis by having eventual and complete absorption of the drug delivery scaffolding and normalization of vasomotor function. The desire to reduce thrombotic potential and normalize vascular function has to be weighed against a potential increase in angiographic late loss and with that