

# Cardiac Risk Assessment of the Older Cardiovascular Patient: The Framingham Global Risk Assessment Tools

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**WHY:** It is estimated that 786,691 Americans would have a new coronary attack in 2014 (AHA Statistics, 2015). For older adults aged 60-79, 69% men and 67% women have cardiovascular disease (CVD), and for those ≥80 years, 84.7% men and 85.9% women have CVD. Therefore, determination of cardiovascular risk is very important. Modifiable cardiovascular risk factors include: physical inactivity, overweight and obesity, uncontrolled elevated blood pressure, dyslipidemia, smoking, presence of metabolic syndrome (presence of three of the following five symptoms: abdominal obesity [waist circumference (men >40 inches, women >35 inches)]; elevated triglycerides ≥150 mg/dL; decreased high-density lipoprotein (HDL) cholesterol (men: <40 mg/dL, women <50 mg/dL); blood pressure ≥130/≥85 mmHg; and fasting blood glucose ≥100 mg/dL) and diabetes mellitus, as well as depressive symptoms and depression. Evidence-based national guidelines provide information needed to provide comprehensive management of these cardiovascular risk factors.

**BEST TOOLS:** The Framingham Global Risk Assessment tools have been used extensively with men and women and with a number of ethnic groups. They are considered the “gold standard” for risk assessment. The lipid profile and anthropometric measures are needed to complete the risk assessment.

**Lipid Profile:** Dyslipidemia leads to the build-up of atherosclerotic plaque in the arteries. Management of the lipid profile resulting in normal lab values reduces the risk of CVD. The table below provides the elements of the lipid profile and their values. ATP III treatment guidelines from the National Cholesterol Education Panel (NCEP) may be obtained at: <http://www.nhlbi.nih.gov/files/docs/guidelines/atglance.pdf>

LIPID TYPE	LAB VALUES
Total cholesterol	Desirable: <200; Borderline high: 200-239; High >240
low-density lipoprotein (LDL) cholesterol (low values are optimal)	Optimal: <100; Near/above optimal: 100-129 Borderline high: 130-159; High: 160-189; Very high: >190
high-density lipoprotein (HDL) cholesterol (high values are optimal)	Low: <40; Borderline: 40-59; High >60
Triglycerides	Desirable: <150; Borderline: 150-199; High >200

**Anthropometric Measures:** Determine the Body Mass Index (BMI) (weight in kg/ height in meters<sup>2</sup>) and waist circumference (measured with a measuring tape at the upper hip bone and top of the iliac crest; in inches) and develop a plan for either weight maintenance or weight loss. In some cases with frail older adults, weight gain and nutritional stabilization may be needed. Nutrition guidelines may be obtained from the Centers for Disease Control at: <http://www.cdc.gov/nutrition/strategies-guidelines/index.html>.

BMI VALUES	WAIST CIRCUMFERENCE VALUES
Underweight: <18.5; Normal: 18.5-24.9 Overweight: 25-29.9; Class I Obesity: 30-34.9 Class II Obesity: 35-39.9; Extreme Class III Obesity: ≥40	Men: Desirable: <40 inches; High: >40 inches Women: Desirable: <35 inches; High: >35 inches

**Framingham Global Risk Factor Assessment:** CVD risk factor assessment is operationalized in many ways including comprehensive history and physical examination including vital sign assessment, serum lab work, diagnostic testing, and use of risk assessment tools. The Framingham Global Risk Assessment tools are comprehensive and effective measures to assess CVD risk in a variety of populations. The best tool is based on: cardiovascular outcome, population of interest, risk timeline, and presence of risk factors. Specific Framingham tools are provided and the Global Risk Assessments for men are on page 2 as an exemplar. All the tools may be accessed at: National Heart Lung and Blood Institute, Interactive Tools and Resources.

1. "Hard" coronary heart disease (Myocardial infarction or coronary death)\*
2. Coronary heart disease: 2-year and 10-year risk\*
3. General CVD\*
4. Stroke/Death after atrial fibrillation
5. Intermittent claudication
6. Recurring coronary heart disease
7. Congestive heart failure
8. Atrial fibrillation

1. Age
2. Total cholesterol
3. High-density lipoprotein cholesterol (HDL)
4. Treated/untreated blood pressure
5. Smoking status
6. Presence of diabetes mellitus

<9 = <1% risk  
 ≥25 = >30% risk

\* Categorical values for global risk assessment tools. The other tools have additional categorical values. CVD = cardiovascular disease

**TARGET POPULATION:** Cardiac risk factor assessment is important for any older adult; all adults over 40 years should be screened for CVD risk initially and then every 4-6 years. The extent of assessment is dependent on family history, presence of CVD, other co-morbidities, and the number of identifiable risk factors.

**VALIDITY AND RELIABILITY:** The two most widely used and tested Framingham Global Risk Assessment tools have high sensitivity and specificity [Coronary heart disease 10-year (95% and 83%) and 2-year risk (67% and 98%)] respectively. All the Framingham Global Risk Assessment tools have high sensitivity and specificity within these same ranges.

**STRENGTHS AND LIMITATIONS:** The Framingham Global Risk Assessment Tools are gender specific and include different tools for individuals with a variety of cardiovascular outcomes. There are instances when the tool overestimates risk in low-risk populations and underestimates in high-risk groups. Studies have examined the accuracy of Framingham risk scores in women, different ethnic and social groups (Goh et al., 2013).

**FOLLOW-UP:** If cardiovascular risk factors are identified, management and treatment guidelines for intervention and/or educational resources are available. Primary care providers, in collaboration with interdisciplinary team members, should formulate goals and comprehensive plans of care with patients, families and caregivers.

**MORE ON THE TOPIC:**

Best practice information on care of older adults: <http://consultgeri.org>

American Heart Association Statistical Update. Heart disease and stroke statistics-2015 Update. *Circulation*, 131, e29-e322.

Available at <https://circ.ahajournals.org/content/131/4/e29.full.pdf+html>. doi: 10.1161/CIR.0000000000000152

ATP III Cholesterol Guidelines and Framingham Risk Score: <http://www.nhlbi.nih.gov/files/docs/guidelines/at glance.pdf>

Goh, L.G., Dhaliwal, S.S., Lee, A.H., Bertolatti, D., & Della, P.R. (2013). Utility of established cardiovascular disease risk score models for the 10-year prediction of disease outcomes in women. *Expert Review of Cardiovascular Therapy*, 11(4), 425-435. doi: 10.1586/erc.13.26

**Table 4. — Framingham Risk Scores for MEN**

Estimate of 10-y Risk (Framingham Point Scores)

Age	Points	Assess Patient's Risk of Heart Disease
20-34	-9	To find out your patient's risk of heart disease, complete this assessment.  1. Circle the number of points in each section that relates to the patient's current status.  2. Add up the points in the section provided (next p).  3. Match the total with the numbers in the list to the right of that section. This will tell you your patient's chance of having heart disease in the next 10 years.
35-39	-4	
40-44	0	
45-49	3	
50-54	6	
55-59	8	
60-64	10	
65-69	11	
70-74	12	
75-79	13	

  

Total Cholesterol	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
<160	0	0	0	0	0
160-199	4	3	2	1	0
200-239	7	5	3	1	0
240-279	9	6	4	2	1
≥280	11	8	5	3	1

  

Nonsmoker	Points				
	Age 20-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79
Nonsmoker	0	0	0	0	0
Smoker	8	5	3	1	1

  

HDL (mg/dL)	Points
≥60	-1
50-59	0
40-49	1
<40	2

Table continues

**Table 4. — Framingham Risk Scores for MEN (cont)**

Systolic BP (mm Hg)	If Untreated	If Treated
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
≥160	2	3

  

Add Up the Points	Total Points	10-y Risk %
Age:	<0	< 1
TC:	0	1
Smoker:	1	1
HDL-C:	2	1
SBP:	3	1
<b>TOTAL:</b>	4	1
	5	2
10-y Risk	6	2
	7	3
	8	4
	9	5
	10	6
	11	8
	12	10
	13	12
	14	16
	15	20
	16	25
	≥17	≥30

Adapted from US Dept of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung, and Blood Institute. NIH Publication No. 01-3305, May 2001.

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