



# Heart Disease and You— Facts about Risk Factors

Heart disease remains the number one killer, claiming one life every 37 seconds. Although heart disease is not common before age 40, fatty streaks in arterial walls have been found in some five-year-old children. During the transition into adulthood, such streaks can become cholesterol-rich plaques with the potential to block arteries. Blocked arteries in the heart cause heart attacks, while blocked arteries in the brain cause strokes. Children and adults can reduce risk by adopting healthy lifestyles.

## What are risk factors?

Your risk of heart disease is influenced by several factors.

Non-modifiable risk factors are those that generally cannot be changed. Examples of non-modifiable risk factors include:

**Age**—men aged 45 and older; women aged 55 and older

**Family history**—parent or sibling with premature heart disease (father or brother before age 55; mother or sister before age 65)

**Gender**—males have higher risk until age 65, then risks between both genders are equal

Modifiable risk factors are generally lifestyle behaviors or habits that can be changed. Examples of modifiable risk factors include:

- Cigarette smoking
- Blood pressure higher than 140/90
- HDL cholesterol levels below 40
- LDL cholesterol levels above 160
- Obesity (Body Mass Index of 30 or more; about 30 pounds overweight)
- Less than 150 minutes of physical activity per week
- Eating foods high in saturated fat and cholesterol

## What about cholesterol?

Every cell in the body requires cholesterol. It also is the starting material from which the body makes vitamin D, steroid hormones, and bile acids for digestion. However, excess amounts of cholesterol (either from over consumption or due to personal genetics) can lead to deposits in the arteries that eventually block blood flow.

Regular monitoring of blood cholesterol levels is recommended for ages 20 and older, with follow-up checks at least every five years. Cholesterol levels are reported as mg/dL, which is the amount of cholesterol in milliliters (ml) per deciliter (dL) of blood.

**LDL-cholesterol** generally transports cholesterol to be deposited into tissues, including arteries. High levels of LDL-cholesterol are associated with increased risk of heart disease.

**HDL-cholesterol** generally transports cholesterol out of the cells and blood vessels to the liver where it is broken down and excreted from the body. Higher levels of HDL-cholesterol are associated with reduced risk for heart disease.

## Total Cholesterol (mg/dL)

Less than 200	Desirable
200-239	Borderline high
240 or more	High

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## “Bad” Cholesterol (LDL) (mg/dL)

Less than 100	Optimal
100-129	Near optimal/ above optimal
130-159	Borderline high
160-189	High
190 or higher	Very high

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## “Good” Cholesterol (HDL) (mg/dL)

<40	Low—major risk factor
60 or higher	High—protective against heart disease

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Source: National Institutes of Health

## What about C-reactive protein?

C-reactive protein, otherwise known as CRP, may be another indicator of heart disease risk. Elevated CRP levels in the blood indicate generalized inflammation and infection. A more sensitive CRP test, called a highly sensitive C-reactive protein (hs-CRP), is available to determine heart disease risk. Studies suggest that hs-CRP can predict cardiovascular events, complications, and outcomes. The theory is that damage to the blood vessel wall of the heart triggers an immune response. This response leads to an accumulation of immune cells, muscle cells, and additional cholesterol, which form plaque in the damaged area.

### CRP Levels Heart Disease Risk

<1.0 mg/L	Low
1.0 to 3.0 mg/L	Moderate
>3.0 mg/L	High

Source: National Institutes of Health

Individuals with high levels of CRP (above 3.0 mg/L) are thought to be at increased risk of having a heart attack because of unstable plaque formations that are more likely to rupture.

CRP screening is not appropriate if other causes of inflammation or infection exist (i.e. arthritis, inflammatory bowel disease, etc.). CRP screening can be done as part of an annual blood profile.

CRP testing may be useful for those at 10 to 20 percent risk for heart attack in 10 years. This risk can be determined by completing the Framingham heart score.

## What is your risk for a heart attack in the next 10 years?

### Men

#### Estimate of 10-Year Risk for Men

(Framingham Point Scores)

AGE	POINTS	HDL (mg/dL)	POINTS
20-34	-9	≥ 60	-1
35-39	-4	50-59	0
40-44	0	40-49	1
45-49	3	<40	2
50-54	6		
55-59	8		
60-64	10		
65-69	11		
70-74	12		
75-79	13		

POINTS	TOTAL CHOLESTEROL				
	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

POINTS	AGE				
	20-39	40-49	50-59	60-69	70-79
NONSMOKER	0	0	0	0	0
SMOKER	8	5	3	1	1

SYSTOLIC BP (mmHg)	POINTS	
	if untreated	if treated
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
≥ 160	2	3

POINT TOTAL	10-YEAR RISK%
≤0	<1
0	1
1	1
2	1
3	1
4	1
5	2
6	2
7	3
8	4
9	5
10	6
11	8
12	10
13	12
14	16

10-Year risk\* \_\_\_\_\_ %

\*Individuals with a 10 to 20 percent risk for heart attack in the next 10 years may benefit from having a CRP screening.

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## What is your risk for a heart attack in the next 10 years?

### Women

#### Estimate of 10-Year Risk for Women

(Framingham Point Scores)

AGE	POINTS	HDL (mg/dL)	POINTS
20-34	-7	≥ 60	-1
35-39	-3	50-59	0
40-44	0	40-49	1
45-49	3	<40	2
50-54	6		
55-59	8		
60-64	10		
65-69	11		
70-74	12		
75-79	14		

#### POINTS

TOTAL CHOLESTEROL	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	1
200-239	8	6	4	2	1
240-279	11	8	5	3	2
≥ 280	13	10	7	4	2

#### POINTS

	AGE 20-39	AGE 40-49	AGE 50-59	AGE 60-69	AGE 70-79
NONSMOKER	0	0	0	0	0
SMOKER	9	7	4	2	1

#### SYSTOLIC

BP (mmHg)	if untreated	if treated
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
≥ 160	4	6

#### POINT TOTAL

POINT TOTAL	10-YEAR RISK%
≤9	<1
9	1
10	1
11	1
12	1
13	2
14	2
15	3
16	4
17	5
18	6
19	8
20	11
21	14
22	17
23	22

**10-Year risk\* \_\_\_\_\_ %**

\*Individuals with a 10 to 20 percent risk for heart attack in the next 10 years may benefit from having a CRP screening.

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## What about triglycerides?

Cholesterol and triglyceride molecules are alike in that they both come from the diet and are manufactured by the body. The difference is that triglyceride is the scientific name for fat.

Fat is found on the body as adipose tissue and in the diet as cooking oil, lard, butter, salad dressings, meat fat, and cheese. In fact, most of the fat stored in your body and circulating in your blood is in the form of triglyceride.

High levels of blood triglyceride are associated with greater risk for heart disease when they occur with high blood cholesterol. It's not clear if high blood triglycerides is a risk by itself.

If you have elevated triglycerides, some of the dietary recommendations to reduce your risk for heart disease may be modified (i.e., carbohydrate intake and/or supplementation of omega-3 fatty acids).

## Serum Triglycerides (mg/dL)

<150	Normal
150-199	Borderline high
200-499	High
≥ 500	Very high

Source: National Institutes of Health

## What about homocysteine?

Homocysteine is an amino acid intermediary that is produced in the conversion of methionine to cysteine (both amino acids). This conversion occurs naturally in everyone and is dependent on the availability of the B vitamins folate, B6, and B12.

Elevated homocysteine levels have been associated with increased risk of coronary heart disease, stroke, and peripheral vascular disease. Smoking, coffee-drinking (more than one cup per day), male gender, older age, lack of exercise, and low folate intake have been associated with high homocysteine levels.

More recently, analyses of multiple studies suggest that supplementation of the B vitamins does not decrease the risk of heart attack. Homocysteine may be a marker of heart disease but not a treatment. Acquiring the B vitamins through diet (fruits and green leafy vegetables) is recommended rather than supplementation. Grain products are also fortified with folate (to decrease incidence of neural tube defects) and has decreased the average level of homocysteine in the U.S. population.

## For more resources, visit these websites:

**ISU Extension Nutrition**

[www.extension.iastate.edu/healthnutrition](http://www.extension.iastate.edu/healthnutrition)

**ISU Extension Distribution Center**

[www.extension.iastate.edu/store](http://www.extension.iastate.edu/store)

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