

The Oklahoma Cooperative Extension Service WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



EXTENSION

Making Sense of Heart Disease Risk Factors

April 2021

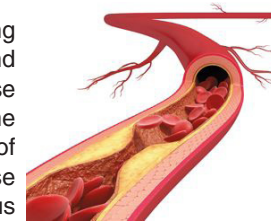
Sam R Emerson, PhD
Department of Nutritional Sciences

Janice R Hermann, PhD, RD/LD
Department of Nutritional Sciences

Introduction

Heart disease is sickness or poor functioning of the heart and its blood vessels. Cardiovascular disease is another term for heart disease. The heart is important because it pumps blood, which contains oxygen and nutrients to fuel cells throughout the body. The main form of heart disease is atherosclerosis, or narrowing and hardening of blood vessels. If the blood vessels in the heart become too narrow or are completely blocked, this can cause a heart attack.

Heart disease is the leading cause of death in the U.S. and throughout the world. Heart disease affects nearly everyone in some way. It is important to be aware of and track factors that can increase or decrease risk for this serious disease.



Source: [Nature Reviews Cardiol](#)

What is a Risk Factor?

A risk factor is any characteristic or exposure that increases the chance of developing a disease. This means the presence of an exposure, such as smoking or poor diet, increases disease risk. Presence of an exposure does not mean the disease will definitely occur but it does mean the disease is more likely to occur.

Non-Modifiable Heart Disease Risk Factors

Non-modifiable risk factors are attributes that can alter the chance of a disease, but are outside of our control. We cannot change these factors; we can only keep them in mind when considering our overall disease risk.

- **Age.** A person's age is a major risk factor for heart disease. As we age, our risk for heart disease increases, regardless of other risk factors.
- **Sex.** Men are at a more increased risk for heart disease compared to women. However, later in life (60's and beyond), the difference in heart disease risk between sexes disappears.

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: facts.okstate.edu

- **Ethnicity.** Certain ethnicities or races including African American, Hispanic and Native American are at increased risk for heart disease.
- **Family history.** Genetics play a role in heart disease risk. Let your doctor know if you have close relatives who have or had heart disease, especially if it occurred at a young age.

Modifiable Heart Disease Risk Factors

Modifiable risk factors are factors we can control that alter disease risk. Since we can change these factors by what we do, they are very important to consider and track.



Lifestyle Behaviors

- **Physical activity.** Regular physical activity helps lower heart disease risk. The opposite is also true – being inactive increases risk. Adults should do at least 150 minutes a week of physical activity. Adults should also do strengthening (such as lifting weights) and stretching activities at least two days a week. In addition, sedentary behavior, or sitting for long periods, can increase heart disease risk even if we exercise regularly. Most of us need to move more and sit less to lower heart disease risk.
- **Diet.** It is no secret that what we eat affects our health, including our heart health. To lower heart disease risk, aim to eat a diet rich in nutrients and low in calories. Fruits, vegetables, whole grains, nuts, beans, peas, lentils, seafood, low-fat dairy and lean meats are “nutrient-



Source: [Harvard Health Publishing](#)

Oklahoma State University, as an equal opportunity employer, complies with all applicable federal and state laws regarding non-discrimination and affirmative action. Oklahoma State University is committed to a policy of equal opportunity for all individuals and does not discriminate based on race, religion, age, sex, color, national origin, marital status, sexual orientation, gender identity/ expression, disability, or veteran status with regard to employment, educational programs and activities, and/or admissions. For more information, visit <https://eeo.okstate.edu>.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. Revised 04/2021 GH.

dense” foods. Nutrient-dense foods provide a lot of nutrients and little calories. On the other hand, fried foods, sweets and fast foods are “energy-dense” foods. Energy-dense foods provide a lot of calories and little nutrients and should be limited in the diet.

- **Smoking.** Tobacco use is a major risk factor for heart disease. Avoiding or stopping tobacco use are major risk-lowering lifestyle approaches.
- **Stress.** Long-term and extreme stress increases heart disease risk. This is likely due to behaviors we perform when stressed (such as over-eating and inactivity) and physical changes (increased stress hormones, inflammation, blood pressure and cholesterol).

Physical Markers

- **Blood pressure.** Blood pressure is the pressure of the blood on the blood vessel walls. A blood pressure reading consists of two numbers, for example 135/95. The first number (systolic pressure) is the pressure when the heart beats. The second number (diastolic pressure) is the pressure when the heart relaxes.

Blood Pressure Categories	Systolic Blood Pressure	Diastolic Blood Pressure
Optimal	<120 mmHg	<80 mmHg
Elevated	120-129 mmHg	<80 mmHg
High Blood Pressure (Hypertension)		
Stage 1	130-139 mmHg	80-89 mmHg
High Blood Pressure (Hypertension)		
Stage 2	≥140 mmHg	>90 mmHg

High blood pressure, or hypertension, means the heart has to work harder to pump blood into the vessels. Overtime, this can overwork the heart, leading to heart disease. In addition, high blood pressure can damage the blood vessels. High blood pressure is a “silent killer” because people can have high blood pressure and not know it.

- **Total cholesterol.** Cholesterol is a type of fat in all human body cells and in foods from animal sources, such as meat, eggs, and dairy products. The body needs cholesterol. However, the body can make the cholesterol it needs so you do not need to have it in your diet.

Total Cholesterol Categories

Optimal	<200 mg/dL
Borderline High	200-239 mg/dL
High	≥240 mg/dL

When cholesterol is high, it can build up in the blood vessel walls, restricting blood flow and oxygen delivery. If this build up occurs in vessels of the heart, it can lead to a heart attack. Fats in the blood travel in transport compounds called lipoproteins (such as HDL, LDL and VLDL). Total cholesterol includes all of the cholesterol in blood lipoproteins.

- **LDL-cholesterol.** LDL stands for low-density lipoprotein. LDL or “bad cholesterol” is the main lipoprotein that promotes cholesterol storage in the blood vessel walls.

LDL-cholesterol Categories

Optimal	<100 mg/dL
Near Optimal	100-129 mg/dL
Borderline High	130-159 mg/dL
High	160-189 mg/dL
Very High	≥190 mg/dL

High LDL can mean cholesterol is being stored in the blood vessel walls. Cholesterol storage in blood vessel walls is a major part of plaque build-up, which impairs how the blood vessels function and can lead to a heart attack or stroke if blood flow is limited or blocked.

- **HDL-cholesterol.** HDL stands for high-density lipoprotein. HDL or “good cholesterol” removes cholesterol stored in the blood vessels walls and takes the cholesterol to the liver for removal.

HDL-cholesterol Categories

Low	<40 mg/dL
Moderate	40-60 mg/dL
High/Optimal	>60 mg/dL

Low HDL means a decreased ability to remove cholesterol from blood vessel walls. Therefore, people with low HDL are at higher risk for heart attack and stroke.

- **Triglycerides.** Triglycerides are another type of fat. Triglycerides are the most common type of fat found in food, body fat stores and the blood. When a person eats a meal high in fat, triglycerides in the blood increase for several hours.

Triglyceride Categories

Optimal	<150 mg/dL
Borderline High	150-199 mg/dL
High	≥200 mg/dL

High triglycerides are a risk factor for heart disease and type 2 diabetes. Like cholesterol, high triglycerides can cause plaque buildup in the blood vessels, which can lead to heart attack or stroke.

- **BMI.** BMI stands for body mass index. BMI is a simple tool for assessing a person’s weight in terms of their height. BMI is a person’s weight (in kilograms) divided by their height (in meters) squared. However, BMI does not distinguish the amount of a person’s weight that is fat versus lean tissue, like muscle.

BMI Categories

Underweight	<18.5 kg/m ²
Healthy Weight	18.5-24.9 kg/m ²
Overweight	25.0-29.9 kg/m ²
Obese	≥30.0 kg/m ²

While BMI is not a perfect guide, people with a BMI outside of the healthy range, especially underweight and severely obese, tend to be at an increased risk for heart disease.

How is Oklahoma Doing?

The following data are from the Oklahoma Department of Health’s 2017 [State of the State’s Health Report](#). These data demonstrate that we are failing as a state to address these critical concerns.

- **Physical Activity.** Among Oklahoma adults, 32 percent did not do any exercise. The national rate is 26 percent. **Grade: F**
- **Fruit and Vegetable Consumption.** Among Oklahoma adults, 46 percent ate less than one fruit serving a day and 17 percent at less than one vegetable serving a day. **Grade: F/C**
- **Smoking.** Among Oklahoma adults, 20 percent were current smokers. The national average was 17 percent. **Grade: D**
- **High Blood Pressure.** Among Oklahoma adults, 38 percent had high blood pressure. The national rate is 32 percent. **Grade: D**
- **High Cholesterol.** Among Oklahoma adults, 37 percent had high cholesterol. The national rate is 33 percent. **Grade: D**
- **Heart Disease Deaths.** Heart disease deaths were 237 per 100,000 people in Oklahoma in 2017. The national average was 165 per 100,000 people. **Grade: F**
- **Death Rate.** The 2017 overall death rate in Oklahoma was 902 per 100,000 people. The national rate was 732 per 100,000 people. **Grade: F**

Putting It All Together: What Can You Do About It?

As you can see, heart disease is a common health problem affecting many people throughout Oklahoma and beyond, and there are several risk factors for heart disease. The good news is that you can improve most of your heart disease risk factors by following these simple strategies:

- ✓ Be physically active
 - Exercise regularly
 - Avoid sitting too much
- ✓ Consume a healthy diet
 - Limit your portion sizes and overall calories
 - Consume more fruits and vegetables
 - Consume more whole grains

Your Name:	Year 1	Year 2	Year 3	Year 4	Year 5
Systolic BP (mmHg)					
Diastolic BP (mmHg)					
Total Cholesterol (mg/dL)					
LDL-Cholesterol (mg/dL)					
HDL-Cholesterol (mg/dL)					
Triglycerides (mg/dL)					
BMI (kg/m ²)					

- Limit foods high in saturated fat, sodium and added sugars
 - Limit processed foods
- ✓ Do not smoke or use any other tobacco products

Monitor your risk as you age by tracking your values over time. Use the table below to track your risk factor values for a five-year period. Your primary care physician can easily measure and provide these values each year for you. Your place of work may also provide these values through yearly health screenings. Or you may periodically check these values at health screenings at local grocery stores or pharmacies.

Summary

Heart disease is a serious public health problem affecting many people in Oklahoma, the U.S. and the world. Fortunately, with guidance from healthcare professionals, **you can make changes to avoid heart disease before it develops.** Some risk factors are not controllable, such as age and family history. However, people can improve many factors such as increased physical activity and improved dietary habits. People should consult with their doctor and consider making necessary lifestyle changes to lower their risk.

If you are interested in educational programs to help reduce your heart disease risks, please contact your local county Extension office.

Additional Resources

Weight Maintenance Guidance from the National Institutes of Health

https://www.nhlbi.nih.gov/health/educational/lose_wt/recom-men.htm

2015-2020 Dietary Guidelines for Americans

<https://health.gov/dietaryguidelines/2015/guidelines/table-of-contents/>

Physical Activity Recommendations from the American Heart Association

<https://www.heart.org/en/healthy-living/fitness/fitness-basics/aha-recs-for-physical-activity-in-adults>

Additional Information on Risk Factor Biomarkers from the American Heart Association

<https://www.heart.org/en/health-topics>