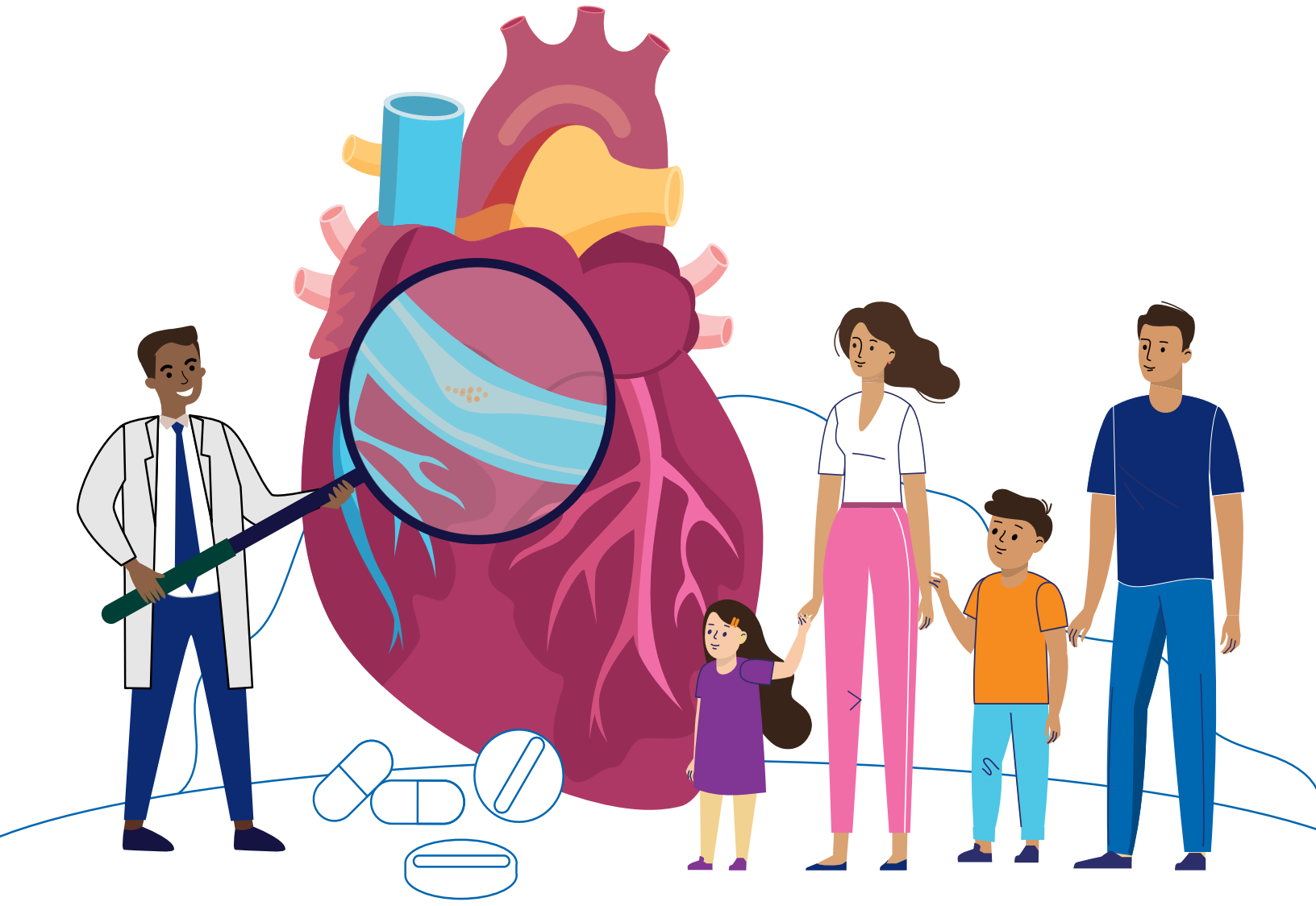
CookChildren's

The healthy heart

An interactive guide for parents and kids



What's inside

CookChildren's

Our Promise

Knowing every child's life is sacred, we promise to improve the well-being of every child in our care and our communities.

Introduction: You have a bright future

Do you ever think about what you want your future to look like? Where you'll live? What you'll look like? What kind of job you'll have?

Maybe you'll be a teacher, helping kids learn. Maybe you'll be a doctor, curing disease. Maybe you'll make the scientific discovery that stops global warming in its tracks.

The possibilities are (almost) endless. But it will take more than imagination, determination and hard work. If you want a long and successful life, you'll need to keep your body healthy.

Right now, your heart is beating. Your blood is pumping. All the cells of your body are hard at work. You probably don't give much thought to what's going on under your skin. Chances are you're pretty healthy and plan to stay that way for a long time. Good health doesn't just happen though. Staying healthy means making smart choices. And the choices you make now will affect your health far into the future.

Healthy heart, bright future

Luckily, most people are born with a strong, healthy heart. But to keep it that way, we have to make heart-healthy choices. For example:

- Eat good-for-you foods.
- Get enough exercise.
- Steer clear of unhealthy habits, like smoking and vaping.

Making these smart choices goes a long way toward preventing heart disease — problems with the heart and blood vessels. Heart disease is the top cause of health problems in adults, in the United States and around the world.

Healthy habits are good for everyone, of course. But some of us have to work a little harder to keep our hearts happy and healthy. That's because some people are more likely to develop heart disease.

You know how things run in families? Features like eye color, whether your hair is curly or straight, how long your toes are — all kinds of traits get passed down in your genes. Unfortunately, some people also inherit genes that put them at risk of getting heart disease.

That's the bad news. But here's the good news: **You can make choices to keep your heart (and the rest of you) healthy. And you can start right now.**

This book will help you take the first steps. You'll learn how your heart and blood vessels work. You'll read about what happens when they aren't working exactly as they should. And most importantly, you'll learn a whole bunch of helpful tips about protecting your heart and staying healthy as you grow.

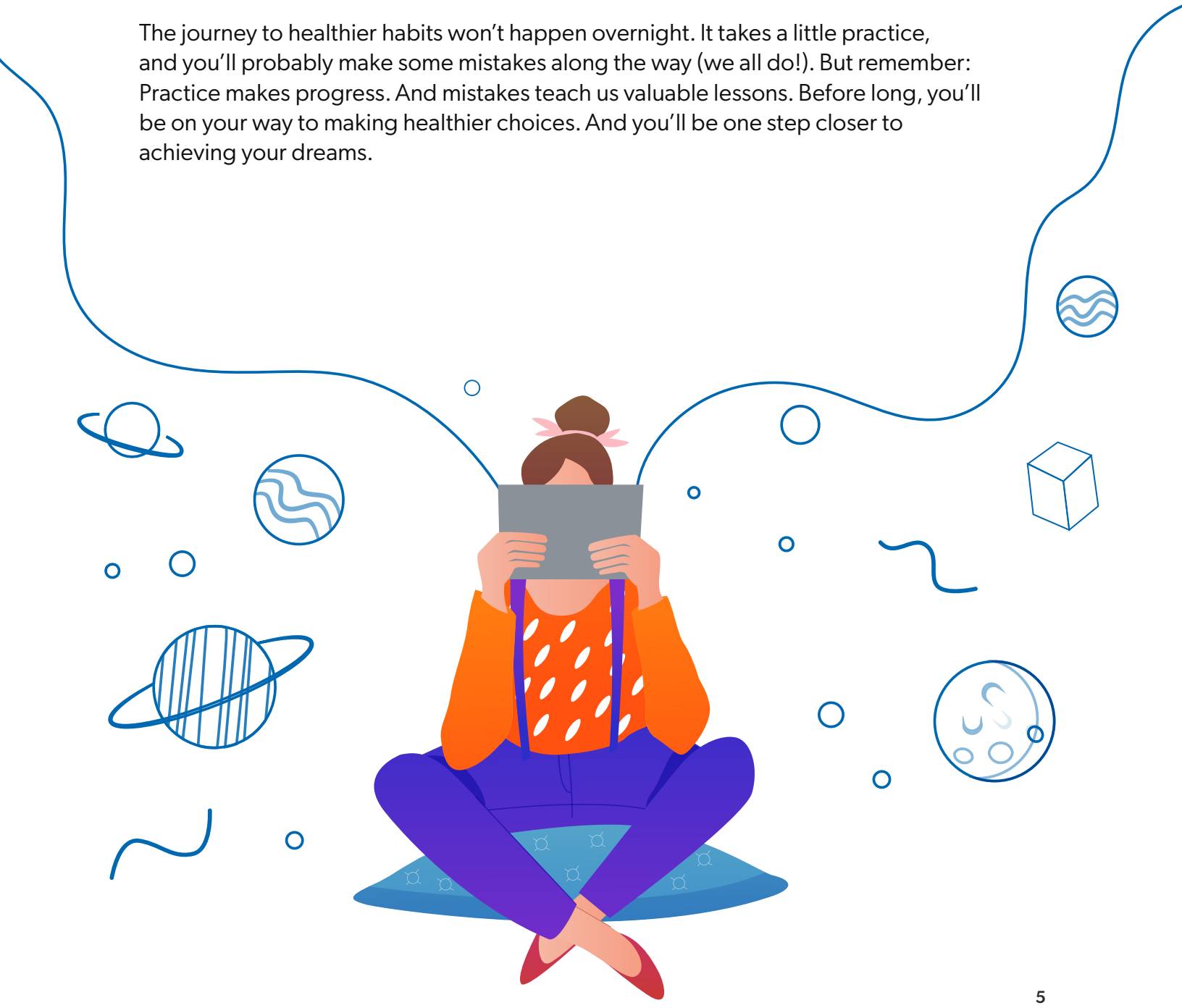
Heart disease (ˈhärt-di-ˈzēz)

The term "heart disease" describes several different conditions that affect the heart and blood vessels. Millions of adults in the United States have heart disease. Making healthy lifestyle choices can help prevent it.

Read this book any way you like — from cover to cover or one chapter at a time. You might decide to read it by yourself or with a family member.

Still have questions? Just ask your parents or a member of your health care team. It takes a bit of work to understand how to live a heart-healthy life.

The journey to healthier habits won't happen overnight. It takes a little practice, and you'll probably make some mistakes along the way (we all do!). But remember: Practice makes progress. And mistakes teach us valuable lessons. Before long, you'll be on your way to making healthier choices. And you'll be one step closer to achieving your dreams.



Parents' corner

As a parent, you want the best for your child. The best schools, the best friends and the best opportunities in life. It goes without saying that you also want your child to be healthy — now and far into the future.

As you try to make the best choices for your child, you're often met with a lot of information from many different places. Stories about healthcare, science and research are heard often in the news.

If you go online or listen to the evening news, you might find or hear interesting but confusing information and opinions about medical issues. It's hard to know what and who you should believe.

The most reliable information about medical conditions, medications and treatment comes from studies performed in research clinics and laboratories. Having reliable information helps you make confident decisions about your child's health.

Your healthcare team is always a great place to start. They can recommend trusted websites that offer clear, helpful information on a variety of topics.

You may also ask your local librarian or other trusted healthcare professionals in your community, such as your local pharmacist, to help you find information on health topics and medical treatments.

You can help your child understand the importance of developing heart-healthy habits. Many of the habits we have as adults began when we were children. We develop food likes and dislikes and exercise habits at a young age. Over the years, those habits help define us. They also impact our well-being.

Everyday choices are especially important to protect against heart disease (also known as cardiovascular disease). Heart disease increases the risk of serious health events, like heart attacks and stroke. In fact, heart disease is the leading cause of illness and death in adults around the world. But with a combination of healthy lifestyle choices and medical treatment for some, children can take control of their heart health.

Unfortunately, some children inherit genes that put them at higher risk for developing heart disease. If your child has been diagnosed with familial hypercholesterolemia (FH) or another condition that increases their risk, it's important to take action. While it's scary to think about your child being at risk, there is a silver lining. The sooner you learn about the risks, the sooner you can take steps to help your child live a long, healthy life.

Cardiovascular health is a big topic, and there's a lot to learn. This guide will help you and your child get started. You might choose to read each chapter aloud together. Or you may prefer to take turns reading to yourselves. Whatever you decide, remember that good health is a team effort. Your whole family is embarking on a heart-healthy journey together. Enjoy the ride!

What can you do?

This book will teach you and your child how the heart and circulatory system work — and how to keep that system working at its best. To make the most of the material, set aside some time to discuss each chapter with your child. Ask if they have any questions. If you can't answer those questions on your own, reach out to your health care team for help. Try the activities we suggest — or create your own healthy activities. Encourage your child to share what they've learned with other family members, friends and classmates.

Chapter 1:

Hello, heart.
Nice to meet you.

You make choices each day that help you stay healthy. For example, you know not to drink from the same glass as a friend who has a fever. You watch for cars while riding your bike with a helmet. And hopefully, you avoid eating that dried-out pizza slice that sat out on the counter all night.

You do many of these healthy behaviors without even thinking about it. In other words, they have become habits. Some habits (biting your nails, teasing your brother) are bad habits. But habits can be good things, too. As you grow, many of the healthy habits you learn as a kid stay with you.

Those habits matter — a lot. What you eat. How often you move. Whether you should try vaping (Spoiler alert! You shouldn't). Everyday choices can raise (or lower) your chance of developing heart disease later in life. If you start practicing healthy choices now, you'll develop good habits that last a lifetime.

Heart disease is the biggest cause of health problems in adults. Does that mean you don't have to think about it until you're old and gray? Not quite. Believe it or not, you'll be an adult sooner than you think. And the choices you make RIGHT NOW will help you keep your heart and blood vessels healthy now, and in the future.

In this chapter, you will learn how the heart and blood vessels work — and what you can do to keep them working well.

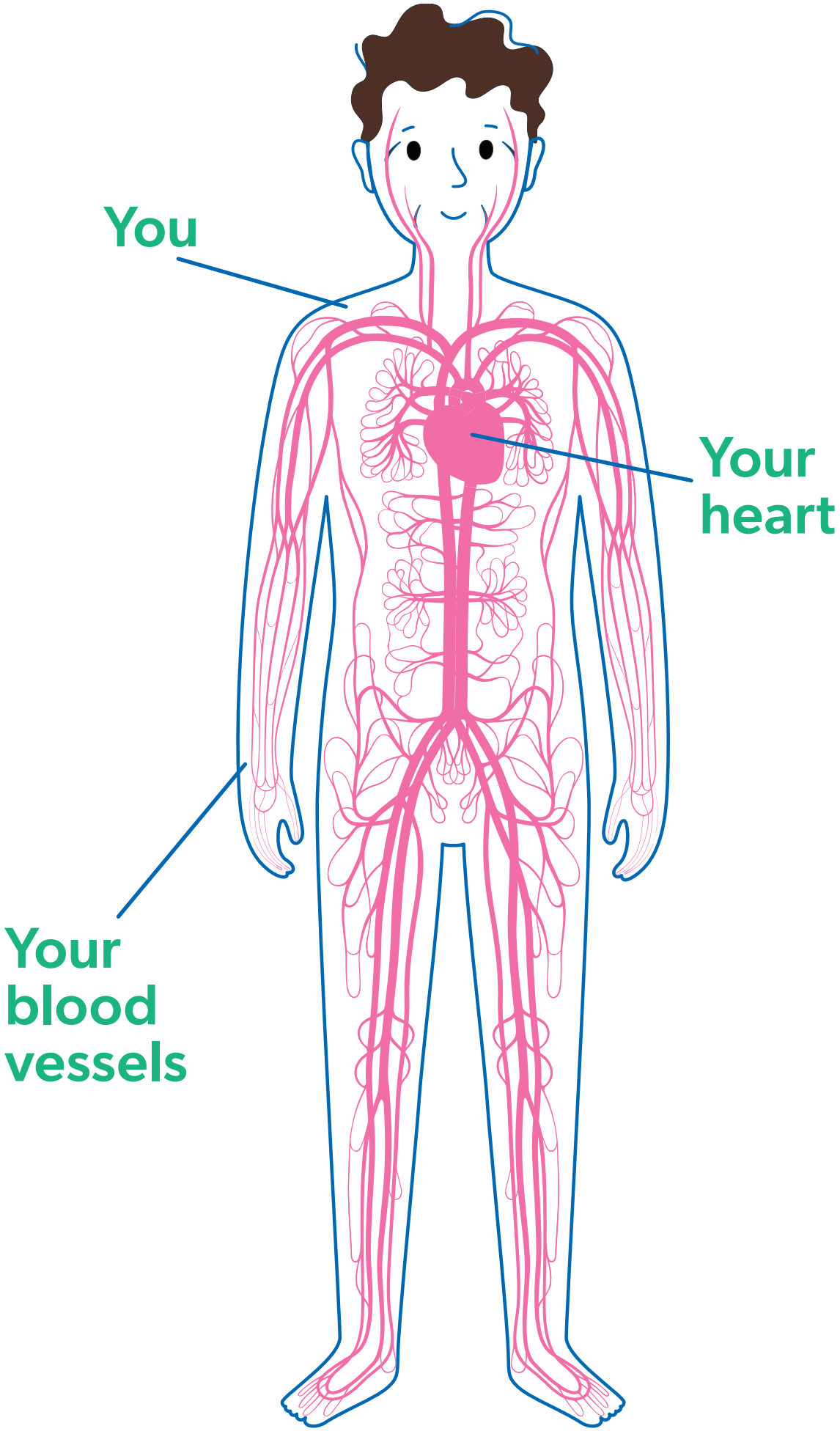
What's the circulatory system?

The human body has millions of cells, each with a unique job. The cells in your brain help you think and remember. Cells in your eyes let you see. Every organ and tissue in your body is made of cells. And each of those cells needs oxygen to stay alive.

Your heart and blood vessels work together to deliver oxygen throughout the body. Together, they make up your circulatory system.

Circulatory system (ˈsər-kyə-lə-ˌtȯr-ē-ˈsi-stəm)

The circulatory system is in charge of moving blood through the body. It is made up of the heart, the blood vessels and the blood. The circulatory system is also known as the cardiovascular system.


You
Your heart
Your blood vessels

The heart: Pump it up

You only have one heart. And it has a huge job. Located in the middle of the chest, nestled between your lungs, the heart pumps blood to all your cells. That blood delivers the oxygen and nutrients your brain and other organs need to stay alive.

Your heart is basically a fancy pump. It beats day and night, pushing blood around your body. The left side of the heart takes blood from the lungs and pumps it to your organs. That blood brings oxygen and nutrients to those organs.

When your cells use up the oxygen in the blood, the blood turns blue. The blue blood heads back to the heart for a reboot. The right side of the heart pumps that blue blood to the lungs. There, the blood picks up oxygen and turns red. Then the process starts all over again and again and ... you get the idea.

Blood vessels: Your body's superhighway

Your blood travels around your body through a massive highway of blood vessels called arteries, which carry red blood away from the heart. Vessels known as veins carry blue blood back toward the heart. Have you ever noticed the bluish lines on the back of your hand? Yup, those are veins, full of blood heading back to your heart.

Nutrients (ˈnü-trē-ənts)

Nutrients are the substances we need to stay alive. These are things like proteins, fats, carbohydrates, vitamins and minerals, which help us grow and give us energy. Nutrients come from the foods we eat. They get broken down in your stomach, pass into your blood and travel to your cells to help them work properly.

Go with the flow: How blood moves

When a car speeds up, it needs more gas to fuel the motor. The same thing happens in your body. When you're active, your muscles need more oxygen and nutrients. In other words, they need more blood.

Have you ever noticed that your heart beats faster when you're playing soccer or running to catch the bus? That's your heart speeding up to pump more blood to your cells.

At the same time, your blood vessels dilate, or expand. Healthy blood vessels are s-t-r-e-t-c-h-y, like a rubber band. When your body needs more fuel, the blood vessels dilate. That stretchy trick lets blood vessels deliver more blood when (and where) your body needs it.

Dilate (ˈdī-ˌlāt)

To become larger. When blood vessels dilate, they expand to allow more blood to flow to your cells.

What could go wrong?

There are a few different reasons heart disease can slow the flow of blood. Sometimes the blood vessels become damaged and stiff. They're not as stretchy as they used to be. That makes it harder for the vessels to dilate.

Another problem happens when the vessels get plugged up. This can happen when a waxy substance called cholesterol clumps up inside the blood vessels. Cholesterol is important for heart health, and you'll read more about it later. For now, though, you just need to know that cholesterol can get stuck inside blood vessels. When it does, it shrinks the open space inside. Imagine that garden hose shrinking to the size of a soda straw. Instead of a steady flow of blood, you end up with a trickle. Drip, drip, drip … that little trickle can lead to big problems when you become an adult, including heart attacks, strokes and peripheral vascular disease.

Keep your body healthy

If heart disease or strokes runs in your family, your doctor may prescribe medicines to help you stay healthy. Those medicines are important, but they won't make up for an unhealthy lifestyle. Whether or not you take medications, it's important to make smart choices in your everyday life.

- Choose healthy foods and snacks.
- Get plenty of exercise.
- Try not to gain too much extra weight.
- Choose not to smoke or vape. (You should avoid hanging out with people when they're smoking, because breathing their second-hand smoke is harmful, too.)

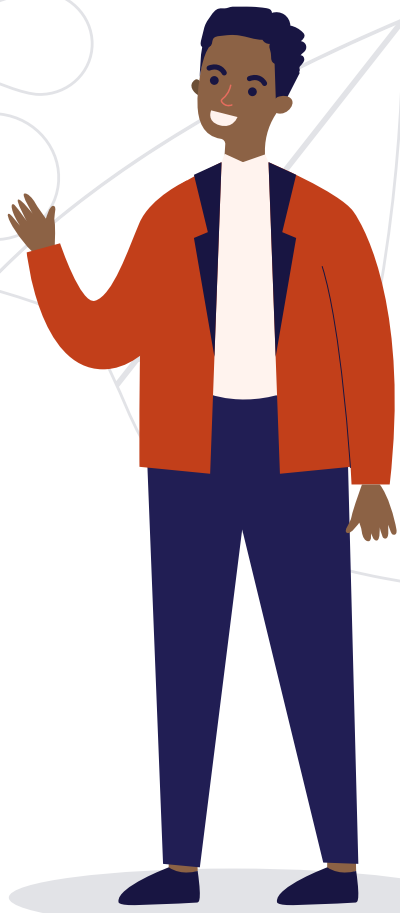
If that sounds like a long list, don't worry. You don't have to get it exactly right all at once. Throughout this book, you'll learn more about making smart, heart-healthy choices. And with a little practice, those healthy choices will soon be a matter of habit.

Did you know?

A **heart attack** happens when the blood vessels to the heart are blocked. Without blood, the heart muscle can die.

A **stroke happens** when blood is blocked from reaching the brain. Like a heart attack, a stroke can cause brain cells to die.

Peripheral vascular disease happens when blood is blocked from other parts of the body. It can cause problems with internal organs, like kidneys. And if the blockage keeps blood from reaching the legs, it can cause pain that makes it hard to walk.



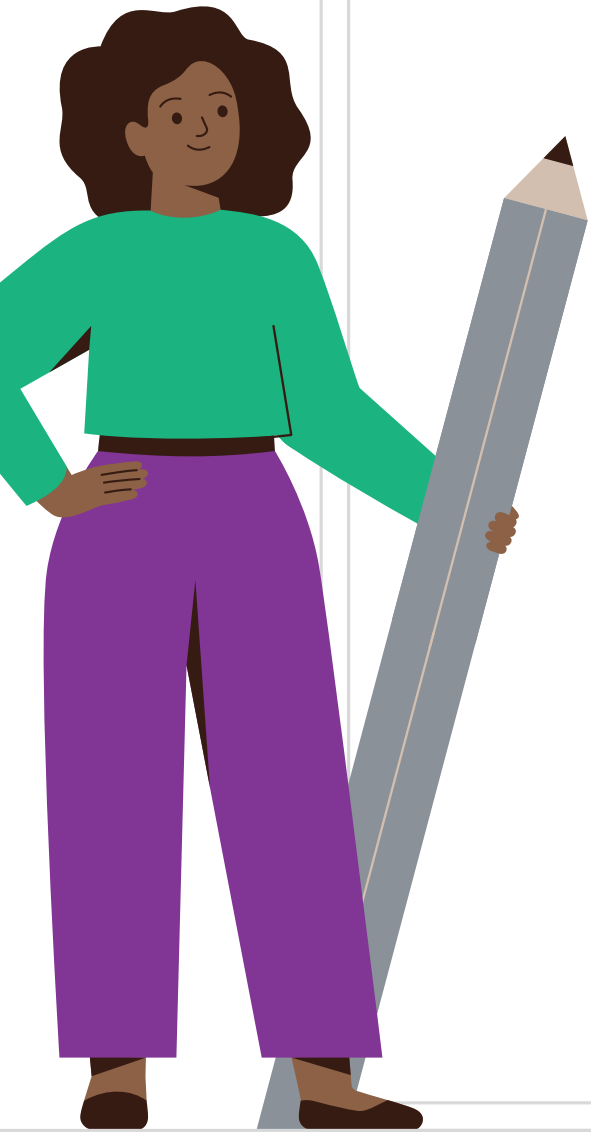
Good advice: Stand up!

Sloths are cute, but you wouldn't want to live like one. Spending too much time sitting and lying around can increase the chances of getting heart disease as you get older. Of course, you can't avoid sitting at your desk all day at school. But whenever you can, step away from the computer or the TV. Stand up and move your body around — even if it's just for a few minutes. Being active is good for your body and your brain.

Did you know?

- Your heart beats over 100,000 times a day. It works hard for you, so take good care of it!
- Over 18 million people over age 20 have heart disease. That's a LOT of people!
- In the United States, someone has a heart attack every 40 seconds.
- Most heart attacks can be prevented — but the earlier you start, the better.

Quiz time!



1. True or false? Heart disease is the number one cause of health problems in adults.

   ○ True

   ○ False

2. Blood vessels should be:

   a. Stretchy

   b. Stiff

   c. Full of cholesterol

3. Heart attacks and strokes happen when

   _____

   can't reach the heart or brain.

4. Which is not a heart-healthy habit?

   a. Choosing good-for-you foods

   b. Sitting still a lot

   c. Exercising often

1. True
2. a. Stretchy
3. Blood
4. b. Sitting still a lot

Dig deeper

As you read this book, you'll have chances to practice what you've learned and put it into action. First step: Grab a notebook and a pencil. (Don't worry, you won't be graded.)

Make a list of your dreams and goals for the future. What do you want to be? Who do you want to be? Do you want to travel? Go to college? Play sports? Have a family? Put it all down on paper.

Remember, you are the reason you're making healthy choices. Those choices will let you live your best life, now and in the future. As you work your way through this book, flip back to this list any time you need inspiration

Parents' corner

Raising kids takes a lot of juggling. You're getting them to and from their practices and clubs on time, overseeing their homework, and making sure the pantry is stocked and the laundry is done.

If you're like most parents, you probably spend a lot of your time focusing on the things that are important for your children today. But tomorrow is right around the corner. Sooner than you realize, your child will be an adult. And it's never too early to start helping them make choices that will keep them healthy in adulthood.

As we discuss in this chapter, heart disease is the world's leading cause of illness and death. Talking about heart attacks and strokes is scary, for you and your child. But like it or not, your kids will be exposed to these hard truths. They'll hear about heart attacks on the news and in the movies. Or maybe they'll learn about heart disease when it affects family members, including grandparents and parents.

Now is the time to encourage your children to take control of their heart health. Depending upon how old they are, your kids may not totally understand what heart disease is all about. Our advice: Start small, and talk often. Talk to your children at a level you think they'll understand. Encourage them to ask questions. Answer honestly. And keep the lines of communication open. Over time, you can share more details about your family's risk of heart disease and the choices your family is making to stay healthy.

What can you do?

Encourage your child to read this chapter, then tell you what they've learned. If a family member has experienced a heart attack or stroke, talk with your child about what happened. Discuss what causes heart attacks and strokes, and what can be done to prevent them. And make a plan to revisit this topic as your child gets older, adding to their knowledge and understanding.

Chapter 2:

What causes heart disease?

Meet the troublemakers

A different kind of disease

Like most kids, you have probably been sick before with the flu or an ear infection. Those illnesses happen when a virus or bacteria invade your body, making you feel lousy. Heart disease is quite different and usually does not have just one cause. It is most often caused by family traits (carried in your genes) and unhealthy habits, such as eating foods and snacks that contain a lot of fat and sugar. Children at risk of heart disease rarely have symptoms. However, without proper treatment, symptoms often develop during adulthood. Fortunately, doctors have several ways of identifying children who have family traits or other things that may affect heart health. Those conditions are called "cardiovascular risk factors."

Cardiovascular (kär-dē-ō-ˈva-skyə-lər)

The cardiovascular system (or circulatory system) involves your heart, blood and blood vessels. Cardiovascular risk factors are conditions that increase the chances your heart may not be healthy when you become an adult.

A risk factor is anything that increases the chances of getting a disease. The three most common risk factors for heart disease are:

- High cholesterol
- High blood pressure
- High blood sugar

Think of these as three troublemakers. You can have one without the others, but they often go hand-in-hand. And they're sneaky too — you can have one or more of these conditions — high blood pressure, high blood sugar or high cholesterol, and still feel fine! That's because it usually takes many years for these three troublemakers to damage your blood vessels and heart. Left untreated, these conditions cause heart disease when you become an adult. Any one of these troublemakers can cause heart disease. But if you have two or all three, the chance of getting heart disease is even higher.

So, what are these troublemakers?

Troublemaker #1: High blood pressure

Blood flows through your body to and from the heart. Each time your heart beats, it pumps blood out through blood vessels called arteries to all parts of your body. This creates pressure inside the arteries (referred to as your blood pressure) that keeps the blood flowing. Day in and day out, your heart keeps pumping away. Sometimes, though, blood pressure can get too high, which is unhealthy.

To understand high blood pressure, imagine you're blowing up a balloon. As you blow air into the balloon, the pressure rises. The balloon starts to expand. You need a certain amount of pressure to keep the balloon blown up. But if you keep blowing, the air pushes harder and harder against the sides of the balloon, until ... POP!

The pressure in your blood vessels can sometimes become too high as well. Don't worry, your blood vessels won't pop like balloons. Still, too much pressure pushing against your blood vessels can make them less stretchy over time. That can make it harder for blood to flow to your heart.

High blood pressure often runs in families. If your blood pressure stays high for many years, it can lead to health problems like heart disease.

Troublemaker #2: High cholesterol

Cholesterol is a type of fat that is normally found in your blood. Your body makes most of the cholesterol in your blood. It's also found in some foods we eat. There are two types of cholesterol. Both are important, but they play very different roles in your health.

HDL cholesterol (HDL-C)

- HDL is often called "good cholesterol." It helps the body get rid of extra cholesterol that can build up in blood vessels. In other words, it helps your body's cholesterol stay at a healthy level.

LDL cholesterol (LDL-C)

- LDL is sometimes called "bad cholesterol." That's because too much can cause problems for your heart and blood vessels. But it's not all bad. Your body needs LDL cholesterol to build cells, make vitamins and grow. But if you have too much LDL in your blood, it can cause damage by clogging blood vessels. That process happens over years (not weeks or months).

Cholesterol (kə-ˈle-stə-ˌrōl)

Cholesterol is a waxy, fat-like substance in the blood. Too much cholesterol can clog blood vessels, causing health problems over time.

Other blood fats

High cholesterol is one of the three main troublemakers. However, sometimes other conditions can cause health problems as well. High levels of cholesterol often has a partner in crime: triglycerides. Triglycerides are another kind of fat that can build up in the blood and cause health problems with your organs, such as the liver and pancreas. They normally act like fuel to keep your cells running — like a car uses gasoline. Cholesterol and triglycerides are often referred to as lipids, which simply means fats.

Your body makes some triglycerides, but a lot of the triglycerides in your blood come from the food you eat. Your body takes the fat in foods and breaks it down for energy. If your body doesn't need all of the energy in the meal you ate, it will store the extra in fat cells.

Troublemaker #3: High blood sugar

Ever heard the term "carbs?" It's commonly used when referring to food or drinks that contain carbohydrates or sugar. These terms all mean the same thing. Your body breaks down carbohydrates into a type of sugar called glucose. Glucose, along with fats, are your body's main source of fuel. Glucose travels through the blood to provide energy to all the cells of your body.

To get the energy your body needs, your cells need to pull glucose out of your bloodstream. To do that, your an organ in your body (the pancreas) makes a substance called insulin. Insulin acts like a key, unlocking your cells so glucose can enter. Sometimes, this process does not work like it should. One example is a condition known as diabetes.

Diabetes (dī-ə-ˈbē-tēz)

A condition that causes high levels of sugar to build up in the blood.

There are two main types of diabetes.

Type 1 diabetes

Sometimes a person's body destroys the cells in your pancreas that make insulin. This is known as type 1 diabetes (T1D). If you have T1D, your body can't make the insulin it needs to help sugar flow from your blood into your cells. Blood sugar levels can climb very high, especially after you eat.

People with T1D need a medicine called insulin to keep their blood sugar levels under control. The insulin children and adults need has to be given as a shot to help keep their blood sugar under control and stay healthy.

Type 2 diabetes

People with type 2 diabetes (T2D) still make insulin, but the insulin doesn't work as well as it should. This is called insulin resistance, a condition that leads to high levels of sugar building up in the blood. T2D is the most common type of diabetes in adults, but kids can get it too. Some adults and children with T2D can take pills to control their blood sugar. Others need to take insulin shots (or a combination of pills and insulin).
In many cases, adults and children develop something called pre-diabetes before they get T2D. Pre-diabetes is a warning sign that you're likely to get diabetes if you don't make some changes. Often, you can prevent T2D by eating a healthy diet, exercising regularly and losing weight (if your doctor thinks you should).

Having high blood sugar doesn't automatically mean you have diabetes. Your health care team can help you determine if your blood sugar is too high — and if so, how to treat it. If you are diagnosed with diabetes or pre-diabetes, there are ways to keep it under control. With treatment, people with diabetes can do all the things they like to do, including playing sports and hanging out with friends.

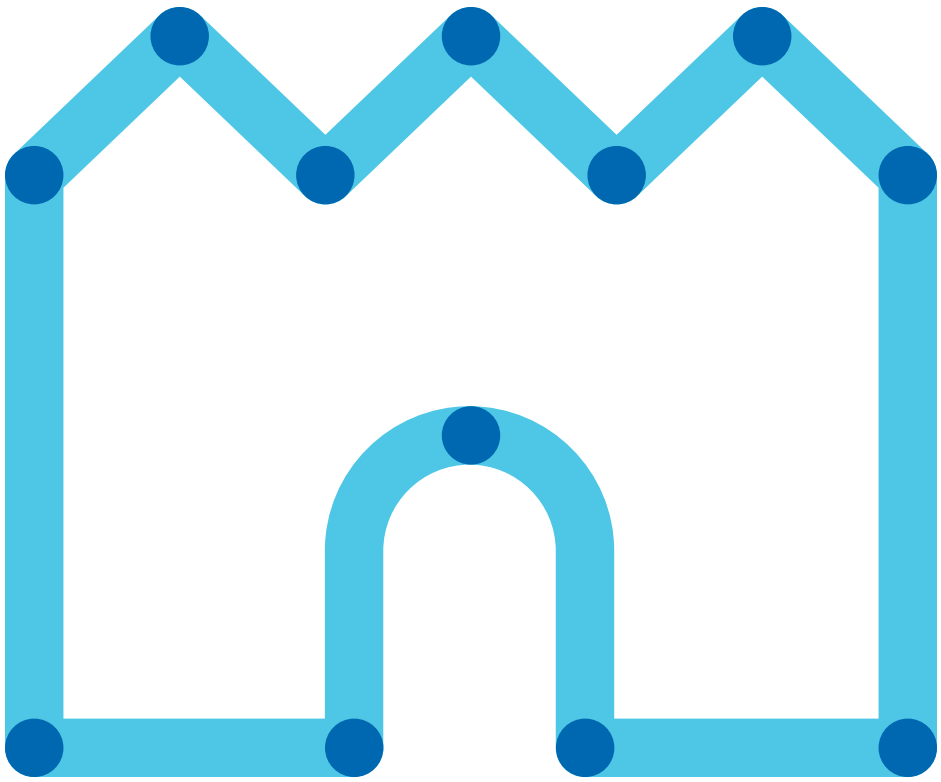
Other risk factors: Partners in crime

High blood pressure, high cholesterol and high blood sugar are three of the leading causes of heart disease. But they aren't the only ones. Things like smoking, not getting enough exercise and other health conditions are also risk factors. In other words, lots of factors work together to lead to heart disease.

Some risk factors are things you can control. You can (and should!) choose not to smoke or vape. But some things can't be helped. Some kids and teens have higher cholesterol levels caused by a family trait, for instance.

Doctors are often interested in where you grew up and what part of the world your family originally came from. That's because people who grow up in certain areas of the world may be more likely to have risk factors for heart disease. Scientists haven't figured out yet if that's because of their genes, something in their environment, local eating habits — or all of the above. What they do know is that if your family is Asian, Hispanic or Native American, there's greater chance you will develop health problems as an adult, such as diabetes, high blood pressure and heart disease.

Whatever your family background is, living a healthy lifestyle, eating properly, getting plenty of exercise, keeping your weight under control, and avoiding smoking or vaping will go a long way toward keeping you healthy.



Did you know?

Sugary drinks, like soda and sports drinks, have lots of sugar without many other nutrients. You probably wouldn't eat a dozen spoons full of sugar. But one can of soda could have as many as 8-13 teaspoons of sugar!

Cutting back on soda and sugary sports drinks is a small change that can have a BIG impact on your health.

Nutrition Facts

Serving Size	200g
Amount Per Serving	
Calories	**600**
	% Daily Value*
Total Fat 60 g	**20%**
Saturated Fat 9 g	24%
Trans Fat 25 g	70%
Polyunsaturated Fat 2 g	2%
Monounsaturated Fat 2 g	2%
Cholesterol 30 mg	**13%**
Sodium 4 mg	**3%**
Total Carbohydrate 40 g	**3%**
Dietary Fiber 10 g	10%
Total Sugars 30 g	60%
Includes Added Sugars 0 g	0%
Other Carbohydrate 0 g	0%
Protein 25g	**20%**

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. Percentages are based on a 2000 calories diet

Good advice

Avoiding foods with lots of saturated fat, added sugar and salt helps keep your blood pressure, cholesterol and blood sugar in a healthy range. Ask your health care team to show you how to read food labels to help you understand what's in the food you're eating.

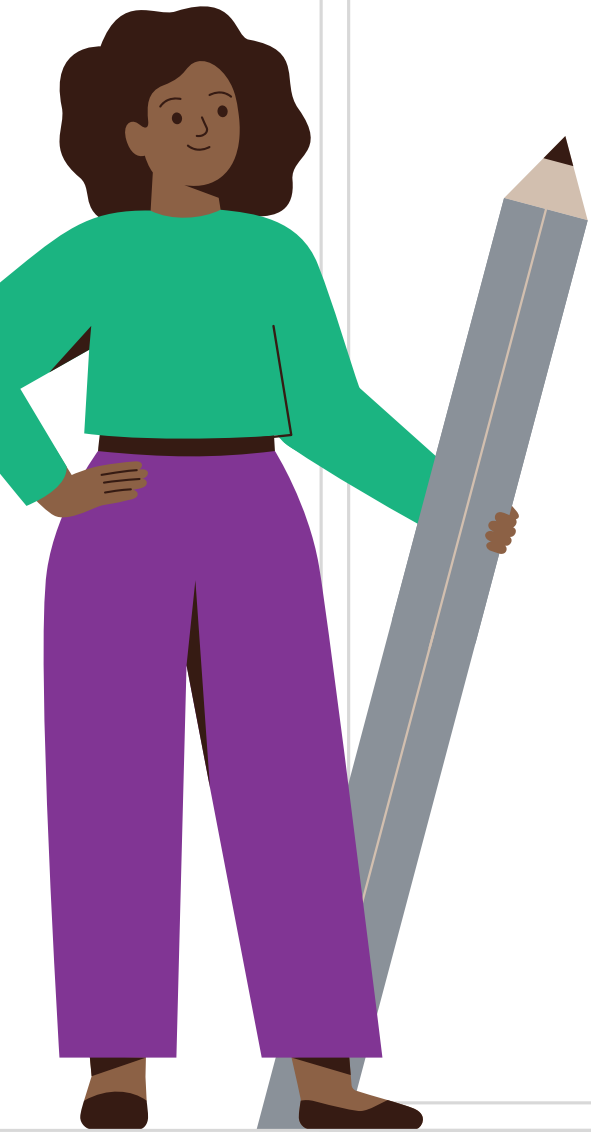
Test out your new skills the next time you go to the grocery store: Figure out how much added sugar is in your favorite packaged snack. Then check the labels to see if you can find a different option with less sugar.

Quiz time!

1. Cardiovascular _____ factors are things that increase your chances of having heart disease when you become an adult.

2. The top three troublemakers that can lead to heart disease are high blood pressure, high blood sugar and high _____.

3. _____ is a substance that helps your cells pull sugar out of your blood and into your cells. In people with diabetes, this substance is missing or doesn't work the way it should.



1. Risk
2. Cholesterol
3. Insulin

Dig deeper

You've learned that high levels of cholesterol in the blood can be unhealthy. But why does cholesterol matter? To find out, try this simple experiment.

You'll need:

- 2 plastic tubes (like PVC pipes) or large drinking straws
- Clay or peanut butter
- Water
- Funnel or measuring cup with pouring lip
- Sink or bowl

1. Use a bit of clay or peanut butter to plug up part of one straw. Leave the other straw open.
2. Using a funnel or a measuring cup, carefully pour water into the open straw. (Do this over a sink or bowl so you don't make a mess!) How quickly does the water flow into the bowl?
3. Now repeat step 2 using the partially plugged straw. What happens to the water?
4. When you have high levels of cholesterol in your blood, it can clump together to form a substance called plaque. Plaque sticks to the walls of your blood vessels—a lot like the peanut butter or clay you stuck to the inside of the straw. You probably noticed that water didn't flow as easily through the clogged straw. The same thing happens in your blood vessels. As plaque builds up inside the vessels, there's less room for blood to flow easily. Your heart has to work harder to pump blood around your body.

Parents' corner

Certain traits and behaviors increase a person's risk of heart disease. These are known as cardiovascular risk factors. The more risk factors a person has, the more likely they are to have health problems in adulthood. Many risk factors present in childhood are still present when children become adults. NOW is a great time to teach your child that healthy habits matter.

What can you do?

As your child gets older and more mature, you can share information about risk factors they might have and how they might affect your child's health. But that information can be shared over time, as your child is ready to hear it.

Kids of all ages, however, can learn about the benefits of building healthy habits. And habits learned during childhood are likely to last a long time! Together, your family can brainstorm a list of healthy choices to replace not-so-healthy habits. Think about challenges that might get in the way of making healthy changes. Do you eat fast food when you're short on time, for instance? What could you do to prepare healthy meals ahead of time? Try to come up with ways to overcome those barriers. Finally, help your child set realistic goals and expectations for change. Developing new habits takes time, but small changes at a young age can make a big difference in making sure your child has a healthy future.

Worksheet

Identifying heart disease risk factors

This worksheet will help you identify factors that increase your child's risk of heart disease. Share the completed worksheet with your health care team. They'll help you find ways to keep your child's heart healthy.

Risk factors you can't change:

- ○ Being male
- ○ Born unusually small or large at birth
- ○ Genetics (family history of diabetes, high blood pressure or high cholesterol)

Risk factors you can change:

- ○ Not having a heart-healthy diet
- ○ Not getting enough exercise
- ○ Gaining too much weight
- ○ High cholesterol
- ○ High blood sugar
- ○ High blood pressure
- ○ Insulin resistance or pre-diabetes
- ○ Cigarette smoking or vaping

What is your child's genetic background?

Some groups of people have family traits that make them more likely to develop diabetes and early heart disease.

Higher Risk

- ○ Asian
- ○ Hispanic
- ○ Pacific Islander
- ○ African American
- ○ Native American/American Indian

Worksheet

Is your child overweight or obese?

Body mass index (BMI) is an estimate of body fat based on height and weight. Your pediatrician can review your child's BMI chart and percentile at your next appointment.

Children with a BMI in the overweight or obese range have a greater risk of diabetes and heart disease:

Body mass index (BMI)

At risk	Higher risk	Highest risk
BMI ≥ 85th% – 94th%	BMI ≥ 95th%	BMI ≥ 99th%

Does your child have diabetes?

Diabetes occurs more commonly when there is a family history of diabetes. Some children have pre-diabetes — an early warning sign that they are likely to develop diabetes in the future. Your child's doctor can use a variety of tests, including a fasting blood glucose test, Hemoglobin A1C and sometimes an oral glucose tolerance test to determine whether your child may have diabetes or pre-diabetes.

Hereditary risk of diabetes

Lower risk	High risk	Highest risk
No family members with diabetes	Grandparents	Mother
	Aunts	Father
	Uncles	Brother/sister

Does your child smoke or vape?

Smoking and vaping are associated with a variety of serious health problems, including children who are exposed to friends or adults who smoke or vape (i.e., second-hand exposure) are also at risk.

Smoking risk

Lowest risk	At risk	High risk
Never used tobacco products	• Tried tobacco products • Exposed to second-hand smoke	Uses tobacco products regularly

Worksheet

Does your child have high blood fats?

The body normally has a certain amount of fat in the bloodstream. After eating, the amount of fat in the blood increases. There are many different kinds of fat in the blood. The main fats doctors pay attention to are cholesterol and triglycerides.

Ask your doctor about your child's cholesterol and triglyceride levels. Write you results in and compare them to the chart below to see if they're in a healthy range.

Total cholesterol: _____ HDL ("good") cholesterol: _____

LDL ("bad") cholesterol: _____ Triglycerides: _____

Blood fats	Desired	High-risk
Total cholesterol	less than 170	more than 200
LDL cholesterol	less than 130	more than 130
HDL cholesterol	more than 40	less than 40
Triglycerides	less than 150	more than 150

These numbers represent general recommendations, and are sometimes revised based on new information or other conditions that might affect your child's health. Check with your child's health care team to see if these recommendations are appropriate for your child.

Is your child's blood pressure too high?

High blood pressure is a risk factor for heart disease and stroke. Normal levels vary with age, sex and height. Where does your child's blood pressure stand?

Top number (systolic blood pressure): _____
Bottom number (diastolic blood pressure): _____

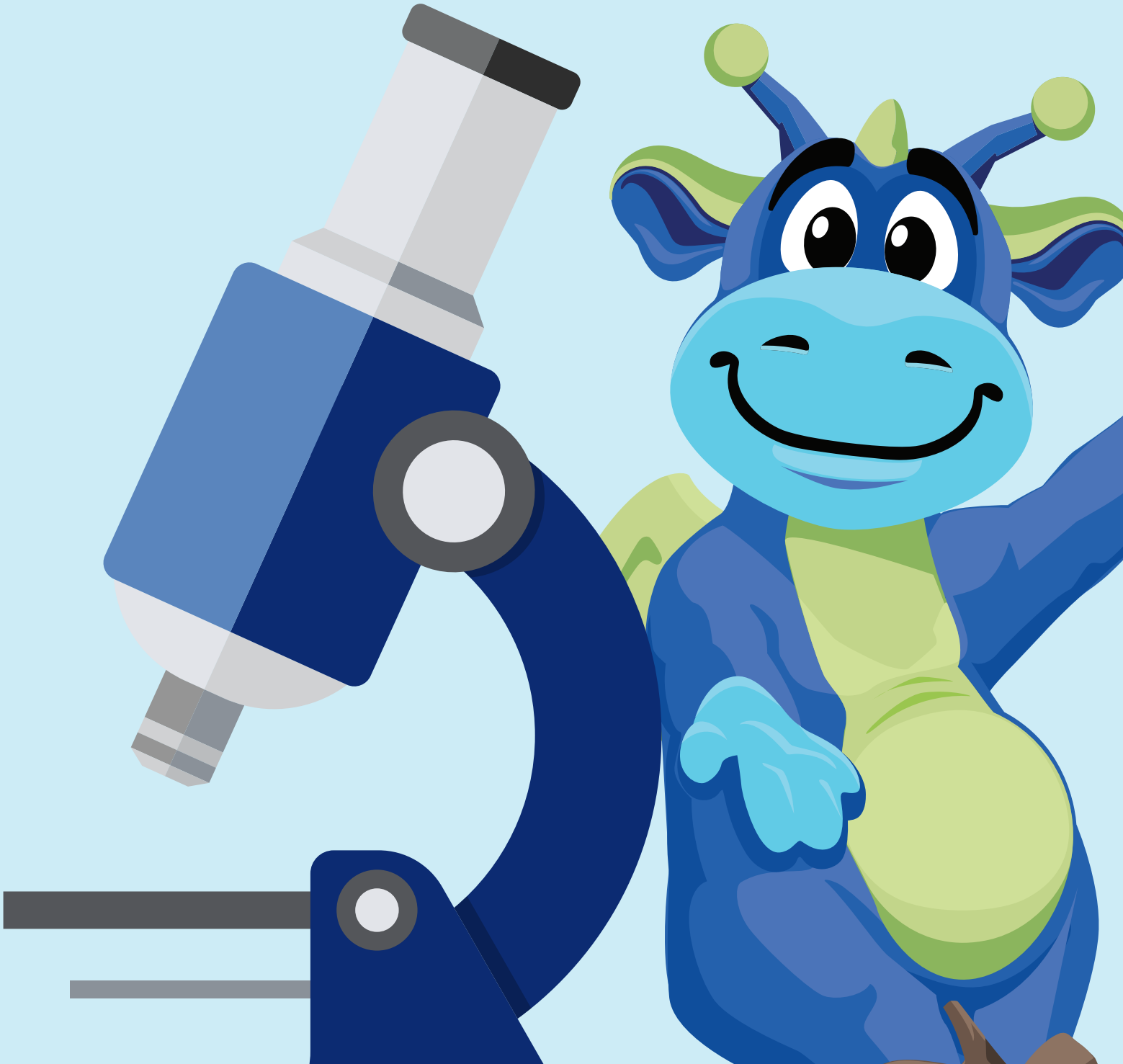
Blood pressure	Desired	Worrisome	High-risk
Top # (systolic)	less than 135	135-140	more than 140
Bottom # (diastolic)	less than 85	85-90	more than 90

Like blood fats these numbers represent general recommendations and are sometimes revised based on new information. Recommendations for optimum blood pressure may be lower in children and adults with health conditions such as diabetes. Check with your child's health care team to see if these recommendations are appropriate for your child.

Chapter 3:

Genetics:

It's a family affair!



Staying healthy isn't something you have to do all by yourself.

Your family members helped make you the person you are — and they're still influencing the person you'll become someday. A healthy lifestyle involves your whole family, too.

In this chapter, you will learn how the family you grow up in makes a difference in your habits (and your health).

The habits you learn as a kid or a teenager often last into your grown-up years. Your favorite meals, how active you are, whether you love to read or play video games — many of your likes and dislikes stick around for years. Your family has a big influence on your life. A lot of that influence is written in your cells.

The ABCs of DNA

Have you ever wondered why your eyes are blue, like your mother's, or you seem to be tall like your father? Those are the traits you inherit from your parents, grandparents and ancestors.

Trait (trāt)

Traits are characteristics you inherit from your parents. Traits include things like your hair color and blood type. Things like high blood pressure, high cholesterol and high blood sugar are also traits that can be passed down from your parents.

But where do traits come from? Time for a quick science lesson! (It's OK, you won't be graded.)

It all starts with **DNA**, a substance that stores information about your body. Each cell of your body contains a full set of DNA, tucked into packages called chromosomes. People usually have 23 pairs of chromosomes — a total of 46 — in every cell of their bodies.

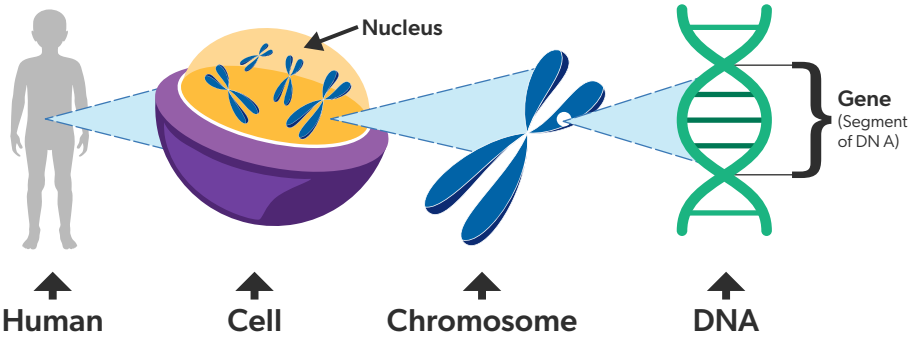
Each chromosome is kind of like a different volume in the book series of your life. The DNA is the story. That story (your DNA) is also broken up into lots of short chapters. Each of those chapters is a gene. The study of **genes** is called **genetics**.

Genes are too small to see without a microscope, but they have a big role to play. They control how your cells work and what traits you have. Some genes contain the instructions that make a cell become a heart cell. They tell toenails how to turn into toenails. They determine whether your hair is curly and how tall you'll get. Each of those genes is passed down from one generation to the next.

But genes can get changed (kind of like a typo in your story). A change in a gene is called a **variant**.

Variant (ver-ē-ənt)

A genetic variant is a permanent change in the DNA that makes up a gene. Sometimes, variants are passed from one generation to another. Many variants are harmless, but some can cause problems like high cholesterol.



Mixed messages

Have you ever texted a friend or answered a test question, only to discover you made a typo? Maybe you spelled a word wrong, or accidentally left out a word altogether. Depending on the typo, your friend or teacher might have known exactly what you were trying to say. Then again, they might be totally confused.

Gene variants work the same way. Consider this sentence:

It's important to keep your heart healthy.

Now imagine that you used a wrong word in that sentence. See if you can find it.

It's important to keep your heart wealthy.

Using the word "wealthy" when you meant to say "healthy" changes the meaning.

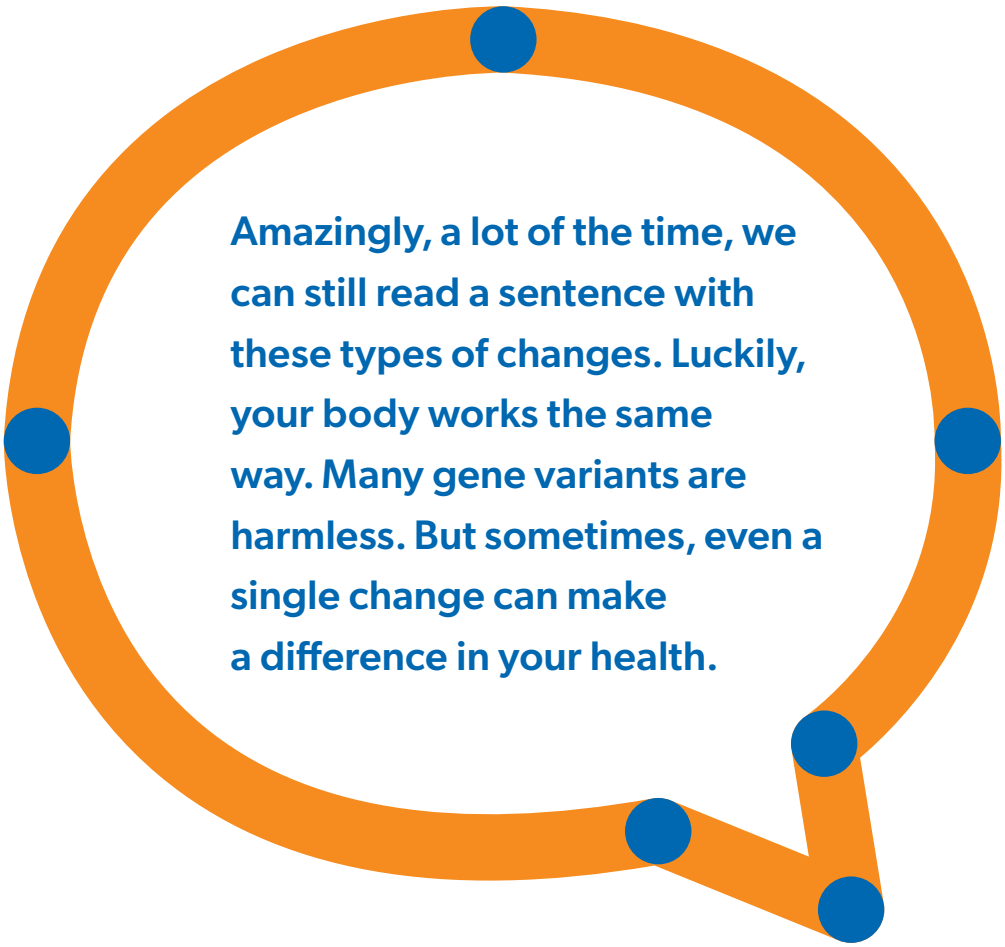
Or your sentence might be missing words.

It's important to keep your healthy.

Leaving out "heart" makes the sentence confusing.

Sometimes, a sentence contains a whole lot of typos:

It's imprtant to keep you're hart helathy.



Amazingly, a lot of the time, we can still read a sentence with these types of changes. Luckily, your body works the same way. Many gene variants are harmless. But sometimes, even a single change can make a difference in your health.

Genes and cholesterol

One way genetic variants can affect your health is by increasing the cholesterol in your blood. Remember LDL-C (the "bad cholesterol") you learned about in the last chapter? Normally, genes contain instructions that keep LDL-C levels in a healthy range. Having cholesterol levels in a healthy zone helps keep your heart working properly.

But in some children, a genetic variant sets the body's LDL-C level too high. **It's like the volume on the radio got turned way up.** Over many years, high LDL-C levels can damage the heart and blood vessels. The genes that control LDL-C levels can't be changed. Luckily, medications paired with healthy choices can turn down the volume on LDL-C and allow you to reach a healthy level.

Scientists have identified many gene variants that are linked to health problems. In fact, there are now lots of tests to find out if you have certain variants in your genes. Your doctor might recommend genetic testing if certain diseases run in your family. The test results will help your doctor figure out the best ways to keep you healthy. Most variants can't be fixed, but the problems they cause can often be treated successfully.

You might be thinking this all sounds really complicated. But you don't have to figure it out on your own. Your health care team will explain what the test means and answer any questions you have. The good news is that making healthy choices can help you live your best life — no matter what's written in your genes.

Quiz time!

1. _____ are the instructions written in your DNA that were passed down from your parents. They control how your cells work and what you look like.

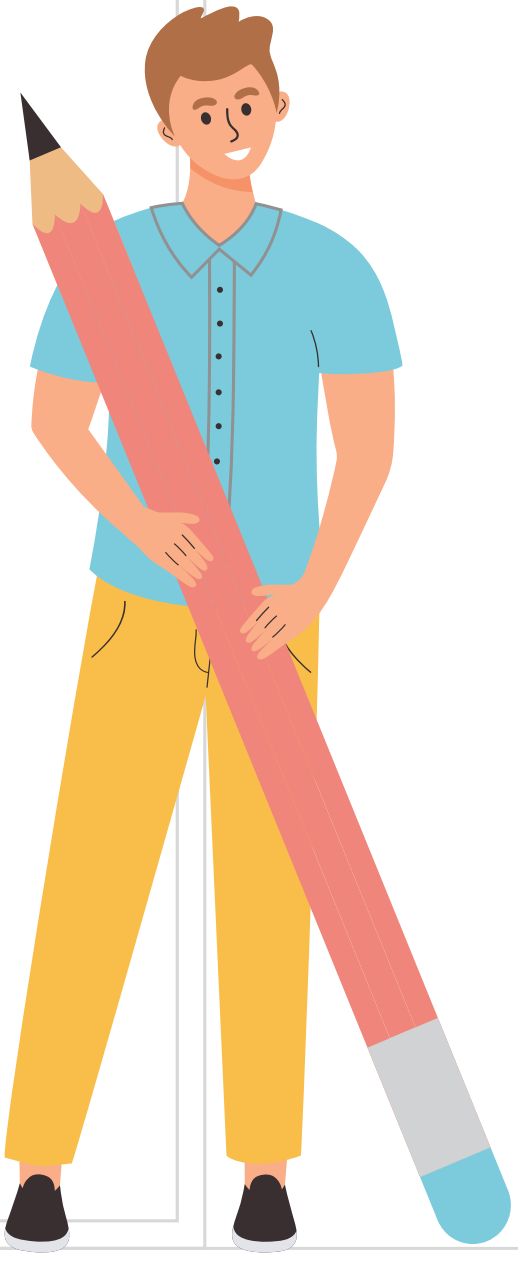
2. Characteristics you inherit from your parents (like hair color and blood type) are called _____.

3. A change in a gene is called a:

   a. Chromosome

   b. Variant

   c. Typo



1. Genes
2. Traits
3. b. Variant

Dig deeper

You probably think you know your family pretty well. But do you know the whole story? If you have a biological family, you can ask a parent (or another relative) to help you draw your family tree. Start by writing your name and the names of your parents and grandparents. What about your great-grandparents? See how far back you can go.

As you sketch out your family tree, ask your parents or other relatives what they remember about your ancestors. Can you learn anything about their health? If so, that information might help your doctors better understand what risks you face. But this project isn't just about health. You might learn other interesting facts about your family members. Where were they born? What languages did they speak? Were any of them famous? Some of the answers might surprise you!

Parents' corner

High cholesterol is often caused by a genetic variant, or misspelling, of our DNA. That variant can get passed through the family to your child and may be present in other members of your family. In some cases, doctors may suggest genetic testing to see if certain variants are present.

What are the benefits of knowing if your child has a genetic variant linked to high cholesterol?
There are a few:

- It may help determining the cause your child's high cholesterol.
- Testing can help your health care team estimate your child's risk of developing heart disease as an adult. The information can guide your family and your health care team as you consider treatment options.
- Genetic testing can also identify whether other family members might be at risk for high cholesterol and heart disease, such as parents, siblings, grandparents, aunts, uncles and cousins.

How is genetic testing done?
Genetic tests are done using a blood sample, cheek swab or saliva sample. (The exact method can depend on the type of test and the lab that analyzes it.) They're usually quick and there is little (if any) physical discomfort from the test

Though the test itself is fairly simple, there are some things to think about if you're considering genetic testing for your child:

- **Managing emotions:** Learning that your child has a genetic condition can be scary. Sometimes a positive test result can lead to feelings of guilt, anger, worry or depression — in you or your child. Still, research has shown that most people adjust well to their genetic testing results. Ask your health care team if a genetic counselor is available to explain the results and answer any questions you have. Other members of your child's health care team may also be able to offer guidance about talking with your child about his or her test results.
- **Considering treatment options:** Genetic test results are just one tool that doctors will use when deciding whether to recommend your child take medications. Sometimes, medications to lower your child's cholesterol may be helpful even if testing does not find a known gene variant linked to high cholesterol. Your health care team will consider whether your child has other risk factors when discussing treatment options.
- **Privacy:** Personal health information, including genetic testing results, is protected by law. Test results will be protected and kept confidential. Insurance companies aren't allowed to deny health care coverage or discriminate against people due to genetic testing results. However, high cholesterol levels and genetic tests could affect the availability and cost of life insurance, disability insurance and long-term care insurance.
- **Cost:** The cost of genetic testing can vary widely, so you should ask about the price before you agree to the test. The cost of genetic testing is covered by most insurance companies, but you might be responsible for a co- payment. Some laboratories offer a cash price, which may be cheaper than paying a deductible.
- **Available information:** Not all genetic variants have been identified by scientists, so genetic tests can't always give you perfect information about your disease risk. Still, scientists are finding new gene variants all the time. As they do, genetic testing can tell us more and more about our health — and the risk of developing health problems.

Making the decision: Should your child have genetic testing?

It's not a decision you have to make by yourself. Your health care team can discuss the benefits, risks and limitations of genetic testing. Whenever possible, it's helpful to include your child in the decision about whether to undergo genetic testing. Sometimes it may be best to postpone genetic testing until your child is mature enough to decide for themselves. Ultimately, decisions about whether to undergo genetic testing should be driven by what's in the best interest of your child.

What can you do?

Your genetic testing checklist:

- Review the benefits and risks of genetic testing with your child's health care team.
- Discuss testing with your child and answer any questions he or she may have.
- You should also check with your insurance company. Don't forget to ask if paying cash for your child's test may be less expense.
- Ask how the results of your child's genetic test will be discussed with you and request a copy for your records.

Worksheet

Family risk factors

Information about health conditions that run in your family can be helpful for understanding your child's health risks. Use the form below to collect as much information as you can about family members. You can share this information with your health care team.

Paternal grandfather

Living: ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Paternal grandmother

Living: ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Maternal grandfather

Living: ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Maternal grandmother

Living: ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Father

Living: ○ Y ○ N

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

I don't know ○

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Your child

Gender: ○ M ○ F

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Mother

Living: ○ Y ○ N

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

I don't know ○

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Your child's sibling's name:

____

DOB: ____________________

Gender: ○ M ○ F

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Your child's sibling's name:

____

DOB: ____________________

Gender: ○ M ○ F

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Your child's sibling's name:

____

DOB: ____________________

Gender: ○ M ○ F

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Your child's sibling's name:

____

DOB: ____________________

Gender: ○ M ○ F

Ever had a cholesterol blood test? ○ Y ○ N

If yes, was the cholesterol normal? ○ Y ○ N

Check applicable

○ Y ○ N High cholesterol
○ Y ○ N Cholesterol medication
○ Y ○ N High blood pressure
○ Y ○ N Diabetes
○ Y ○ N Heart attack or stroke
○ Y ○ N Smoke

Chapter 4:

Cholesterol:

Too much of a good thing!

As you probably know, two types of fat are normally found in your blood: cholesterol and triglycerides.

In this section, you'll learn more about cholesterol — what it is, what it does and why it gets a bad rap.

You'll learn more about triglycerides later.

What is cholesterol?

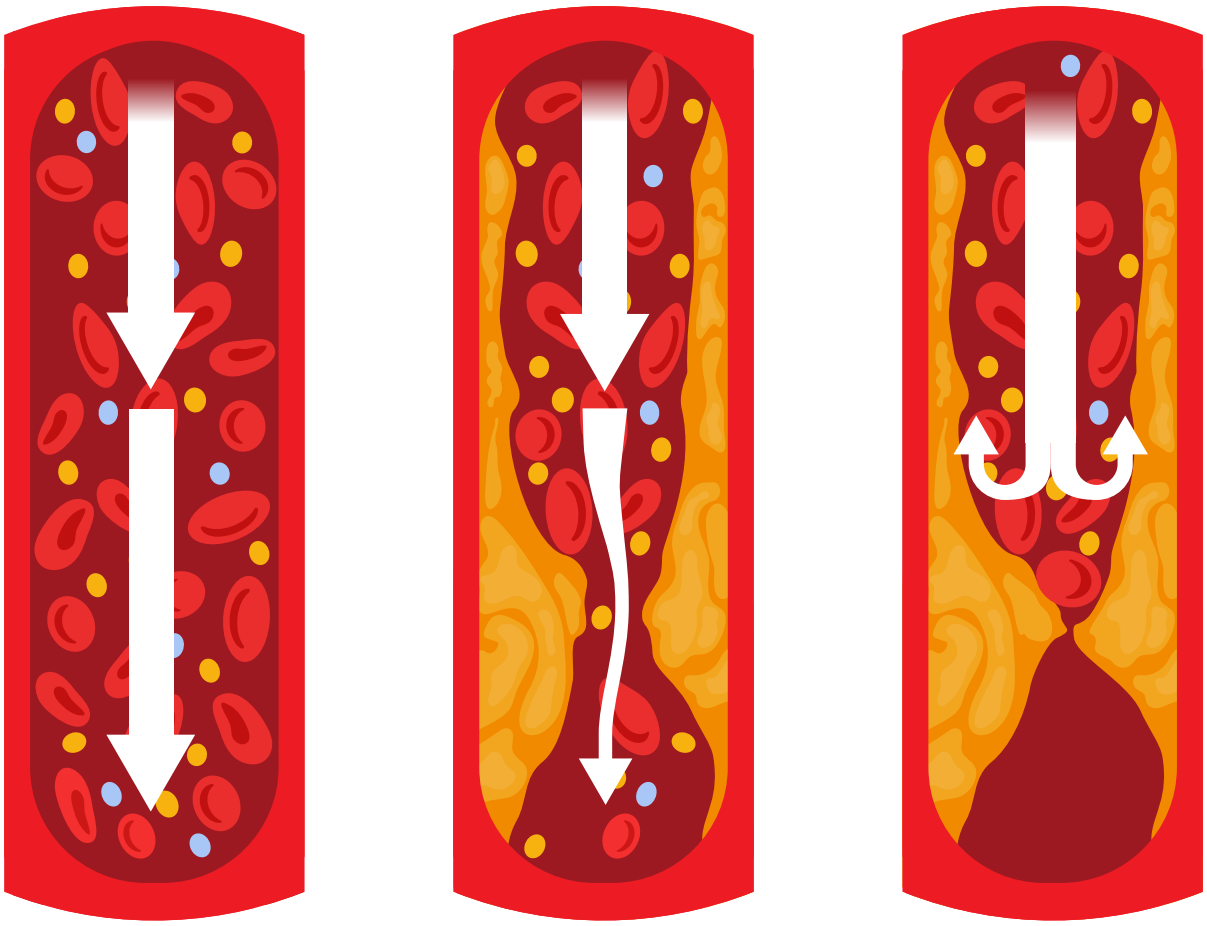
Cholesterol is a type of fat normally found in everyone's blood. You might be surprised to learn that it does a lot of good stuff like making cells, hormones and vitamins. Cholesterol also plays a role in helping the body grow and develop. With all those jobs, it's easy to see why cholesterol is important. When it comes to cholesterol, though, too much can cause problems.

Cholesterol comes in two types:

- HDL cholesterol: High-density lipoprotein cholesterol, or HDL-C, is nicknamed "good cholesterol." It helps the body get rid of extra "bad" cholesterol.
- LDL cholesterol: Low-density lipoprotein cholesterol, or LDL-C, is the "bad cholesterol." Spoiler alert: It's not all bad!

Your body uses LDL-C to build important things like cells. However, too much cholesterol in your blood can clog blood vessels and cause problems for your heart when you become an adult.

When people talk about cholesterol, they're usually talking about LDL-C. That's the cholesterol in the LDL molecule, which carries more than 75% of the cholesterol in your blood. When the level of LDL-C in the blood is too high, it can cause big problems later in life.



Normal blood flow
Healthy (no plaque buildup)

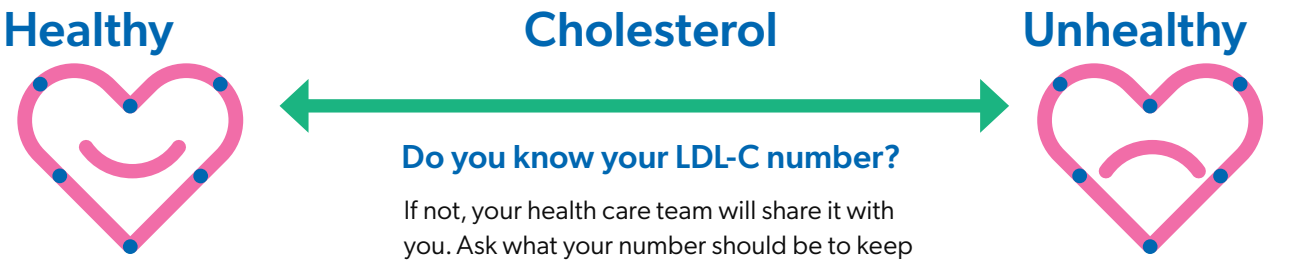
Your blood normally flows freely through your arteries to all parts your body.

Partially blocked artery
Moderately severe plaque buildup

Fully blocked artery
Severe plaque buildup

When you have too much cholesterol, your arteries can become blocked, slowing down or stopping blood from flowing to organs, like your heart in brain.

Rather than thinking about all LDL-C as being "bad," it is helpful to think about the level of LDL-C as being healthy or unhealthy.



Ideally, LDL-C should be 130 mg/dL or less. For those with high levels of cholesterol the LDL-C should be 100 mg/dL or less.

Do you know your LDL-C number?

If not, your health care team will share it with you. Ask what your number should be to keep you healthy. If it is too high, ask what you can do to lower it.

The higher the LDL-C, the more likely it is to clog or block blood vessels as you age.

Where does cholesterol come from?

You've learned that cholesterol comes from the foods we eat — especially foods that come from animals (like cheese or beef). That's only part of the story, though. Most of the cholesterol in your blood is made by your own body — specifically, your liver. That's right! As much as 75% of your cholesterol in your body comes from you. What goes wrong to make your cholesterol too high? Let's find out.

What causes cholesterol to be too high?

There are three main things that can cause the level of cholesterol in your blood to climb too high:

Diet

Eating unhealthy foods and drinks can make cholesterol levels go up. But the opposite is also true. If you choose healthy meals, snacks and beverages, you can help keep cholesterol levels lower. In particular, you should limit foods high in saturated fat (such as meats, dairy products, and some baked and fried foods). Saturated fat can increase the level of unhealthy cholesterol in the blood.

Medical conditions and medications

Some medical conditions can affect your cholesterol. Problems with your thyroid, liver or kidneys sometimes cause cholesterol levels to rise. Your health care team will do some tests to see if you have one of those problems. If you do, your team will discuss what treatment is best. Once you treat the condition, your cholesterol level might get better.

There are also some medications that can cause your cholesterol levels to get too high. Some common medications that do this include steroids, prescription medication to treat acne, and birth control pills. Tell your health care team if you take any medications, including dietary supplement and herbs. If they're affecting your cholesterol level, your doctor might suggest a different medication.

Genes

One of the most common causes of high cholesterol is something you can't fix by yourself. That's because the problem is in your DNA. Some people inherit genes for a condition called **familial hypercholesterolemia**, or FH.

Familial hypercholesterolemia (fə-ˈmil-yəl hī-pər-kə-ˌle-stə-rə-ˈlē-mē-ə)

A genetic variant is a permanent change in the DNA that makes up a gene. Sometimes, variants are passed from one generation to another. Many variants are harmless, but some can cause problems like high cholesterol.

What is FH?

Familial hypercholesterolemia is a mouthful. Let's break down what it means. Familial means the gene is passed down in families, from grandparents to parents to children. Hyper means the levels are too high. Cholesterolemia means that FH affects cholesterol levels.

In other words, people with FH inherit a gene that makes their cholesterol levels too high. To understand why levels go up, think about this example: When you and your classmates arrive at school, you probably enter the building through the main doors. Then you all go to your assigned classrooms (hopefully without being late). Now imagine what would happen if half of the classroom doors wouldn't open. There would be a bunch of students standing around in the hallways. What a mess!

Something similar happens with the cholesterol in your blood. To do its job, cholesterol must find open doors where it can leave the bloodstream and enter the cells. Genes control whether those doors open the right way. If they don't open the way they should, the cholesterol builds up in your bloodstream — just like too many kids in the school hallway. Eventually the overcrowding can cause the flow of blood to slow down. Over time, that can damage your heart, brain or other important parts of the body.

How is FH inherited?

Most children who have FH inherit it from one of their parents, just like they might have blue eyes like their mother or curly hair like their father. When a parent has FH, there's a 50-50 chance their kids will, too. If both parents have FH, the odds are even higher.

It can be upsetting to find out you have a genetic condition like FH. The good news is that finding out about it while you're still young is very helpful. With help from your health care team, you can find safe and effective ways to lower your cholesterol to a healthy level and have the same health risk as people without FH. That's great news!

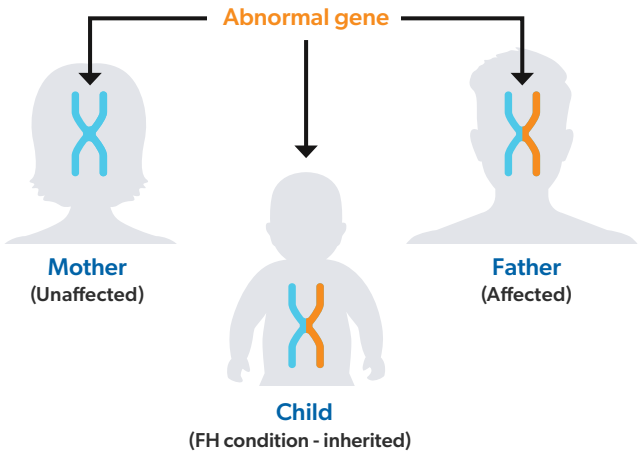
Achieving a healthy level of cholesterol with FH

In people with FH, the genes that control cholesterol don't work the way they should, and cholesterol levels get really high. Making healthy food choices is important. However, foods alone won't keep cholesterol levels low. If you have FH, you'll need to take special medications to keep your cholesterol at a healthy level. Because the genes you're born with are part of you for your entire life, some form of medication will be necessary from now on to control your cholesterol.

Currently the safest and most effective cholesterol medications are called statins. Doctors commonly prescribe statins to lower cholesterol. You may have seen them advertised on TV or have a family member who takes a statin. These medications have been shown to be safe and effective at lowering cholesterol in children and teenagers, too.

Statin (sta-tᵊn)

Statins are prescription medications that lower levels of LDL cholesterol in the blood.



Adults who take statins sometime have side effects such as muscle aches and pains. In children and teens, side effects from statins are rare. The biggest challenge for children who are using a statin is usually remembering to take it!

Statins come in pills that are easy to swallow. Usually, you only need to take it once a day. That shouldn't be so hard, but young people are often busy and in a hurry. Does that sound familiar? Busy or not, it's important to remember to take your medication every day, following your doctor's directions. If you have a cell phone, you might try setting an alarm to remind you. Keeping cholesterol levels at goal will help you stay healthy for years to come. (Your goal is the level of cholesterol your health care team feels is best for you. Be sure you know what your personal cholesterol goal is.)

Besides statins, there are other medications to help lower cholesterol as well. It's likely that scientists will develop even more options in the future. Some people take more than one type of medicine to control their cholesterol. Your health care team can discuss medications with you and offer advice to help you reach your cholesterol goal.

How do you know if you have FH?

Good question. Your health care team will ask you lots of questions about your eating and exercise habits. They'll also want to know about your overall health, such as whether you've ever been in the hospital or needed surgery, and whether you take any medications or supplements. Finally, they will want to hear all about your family, including your parents, siblings, grandparents, aunts, uncles and other relatives. It's especially important to tell them if any relatives have had heart or blood vessel problems, such as a heart attack or stroke.

It's a good idea for you and your parent or guardian to discuss the answers to these important questions before your clinic visit. If you find out more information after your clinic visit, that's OK. Let the health care team know what you have learned about your family's health the next time you have a clinic visit.

During your office visit, your health care team will suggest one or more tests to be sure you don't have other medical conditions that might cause high cholesterol. If not, your doctor will probably ask you to change the way you eat and, if you're not very active, to exercise for 30 to 60 minutes every day, if possible. If you haven't been very active, it's best to start slowly.

After three to six months, you'll take another blood test to see if your cholesterol level has changed. If you have FH, you might notice a small decrease in your cholesterol level after making these changes. However, if you have been following a heart-healthy diet and recommendations for being active, and your cholesterol is still high, you probably have FH.

Genetic tests can also be helpful. Because FH is caused by variants in the genes that control your cholesterol, genetic tests can often tell exactly which genes are causing the problem. However, not all genes that cause high cholesterol have been discovered yet. Even if your test doesn't find a known genetic change, you may still benefit from medication to lower your cholesterol. Your health care team can help you understand your genetic test results and what would be best for you.

Other risk factors that make you unhealthy

If you have FH, high levels of cholesterol can increase your risk of having blocked blood vessels and heart disease later in life. Luckily, you can lower your risk and stay healthy by adopting a healthy lifestyle and taking medication to lower your cholesterol. However, there are other things besides high levels of cholesterol that can increase your risk. Some of those things, called risk factors, include:

- High blood pressure
- Overweight or obesity
- Cigarette smoking or vaping
- Some medical conditions, such as diabetes, HIV or juvenile rheumatoid arthritis

If you have other risk factors for heart problems, treating them can lower your risk. Share your concerns with your health care team and ask what you can do to improve them.

It's a family affair

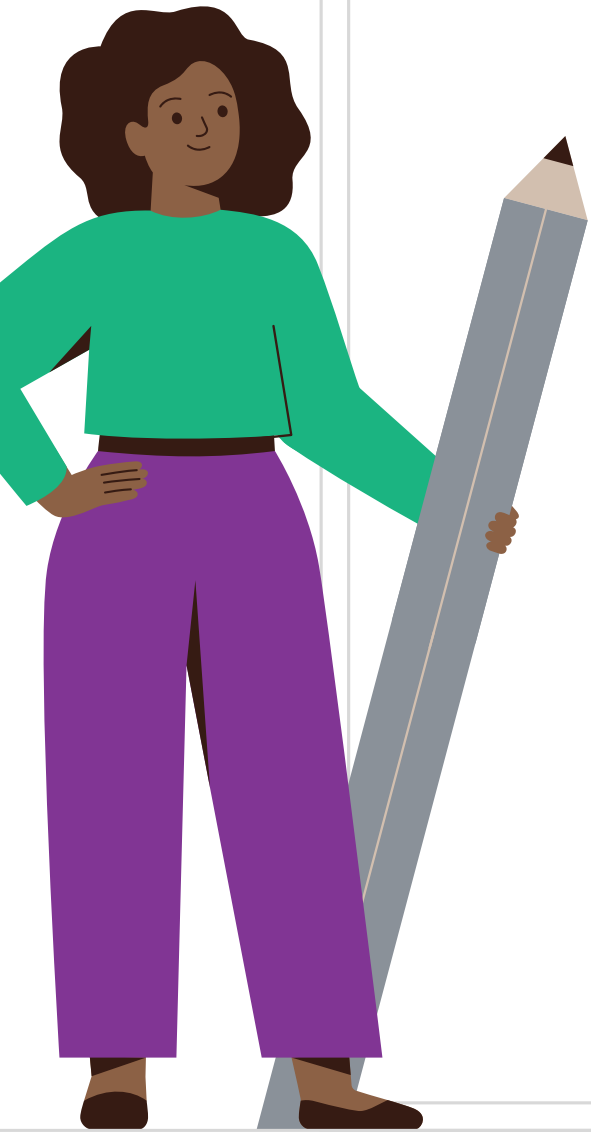
You've learned that FH is passed down from grandparents to parents and from parents to children. If you're diagnosed with FH, it is important to share that information with members of your family, like your grandparents, aunts, uncles and cousins. Like you, other family members might have FH and be at risk of blood vessel and heart problems. Some of them might already know they have FH. Others might never have had their cholesterol tested. If they haven't, you might want to talk to them about your experience. When people have FH, the sooner they get treatment, the more likely they are to avoid health problems.

A final word

Finding out you have a genetic condition like FH can be really unsettling. The good news is that as a child, you are likely very healthy, and there are safe and effective ways to lower your cholesterol and help you stay healthy.

Finding out you might need medication for the rest of your life might make you sad. Or angry. Or frustrated. Maybe all of the above! Everybody deals with disappointing information in their own way. Ignoring the problem doesn't make it go away. Often it helps to talk with people you trust, like your parents or your doctor, about how you feel. With time, you'll find out how to cope with the challenges of living with FH. And with proper treatment, you can look forward to a long and healthy life. The sky's the limit!

Quiz time!



1. **Most of the cholesterol in your blood comes from:**

   a. The food you eat

   b. Your liver

   c. Your brain

2. **The term "hyper" means:**

   a. Too high

   b. Too low

   c. Just right

3. **True or false: Statins are drugs that lower blood pressure.**

   ○ **True**

   ○ **False**

1. b. Your liver
2. a. Too high
3. False, statins lower cholesterol

Dig deeper

It can take time to get used to taking daily medications, but it's worth the effort. Medications can help you stay healthy now and far into the future. These tips will help you make medications part of your regular routine.

- Get in the habit of taking your medication at the same time every day, such as when you first wake up, when you eat dinner or when you brush your teeth before bed.
- Try setting an alarm on your phone or hanging up a sign to remind you to take your medicine.
- A pillbox can help you organize your medications and see what you need to take each day.
- Keep a list of all the medications you take. Keep the list handy to share with your health care team, especially when you're seeing a new doctor. If your medications change, be sure to update your list.

Make a plan! What will you do to remember to take your medications at the right time each day?

Write your plan here:

Parents' corner

Familial hypercholesterolemia (FH) is an inherited condition that causes very high cholesterol levels. Learning your child has a medical condition like FH that runs in the family can be hard. Parents of children with FH often feel scared, sad, angry or a hundred other emotions. Everyone reacts to such news in their own way and in their own time. One reaction many parents share: guilt. Parents often feel guilty that they passed along a trait to their child that may cause health problems in the future. Such a reaction is understandable. But FH is nobody's fault. And you're in good company! FH is a very common condition, affecting one out of every 200-250 people. You didn't ask for this gene, and you couldn't control passing it to your child. In the case of FH, there's good news! While you can't prevent your child from having it, you can have your child tested. With early detection and effective treatment, most blood vessel and heart problems can be prevented. FH is a condition your child will have to manage from now on, but treatments are safe and effective. And the earlier cholesterol levels are brought under control, the greater the chances your child will live a long, healthy life.

What can you do?

You should be aware that all children in the U.S. should undergo cholesterol testing between 9 and 11 years of age as part of their routine health care. If the cholesterol level is normal, this test will be repeated at 17 to 21 years of age. For an adult, cholesterol is routinely tested every five years. If you know or suspect FH runs in your family, your child should be tested at a younger age. It's a good idea to test your child's cholesterol level, starting at 2 years of age and older if:

- Either parent or another family member has FH or is taking cholesterol-lowering medication
- A parent or another family member has had a heart attack or stroke under the age of 55 (for men) or 65 (for women)
- Your child is adopted and you don't know his or her medical history

Cholesterol tests are readily available, inexpensive and can be done with a finger prick or through a regular blood draw. Testing can be done in anyone over 2 years old. Some results are available immediately, while others might take a few days. In either case, be sure someone contacts you with the result of your child's cholesterol test. If the tests show high cholesterol, try not to worry. High cholesterol and familial hypercholesterolemia can be well managed.

Chapter 5:

Triglycerides:

Energy from fat

As you might know, two types of fat are normally found in your blood: cholesterol and triglycerides.

In this chapter, you'll learn more about triglycerides — what they are, what they do and the problems they can cause.

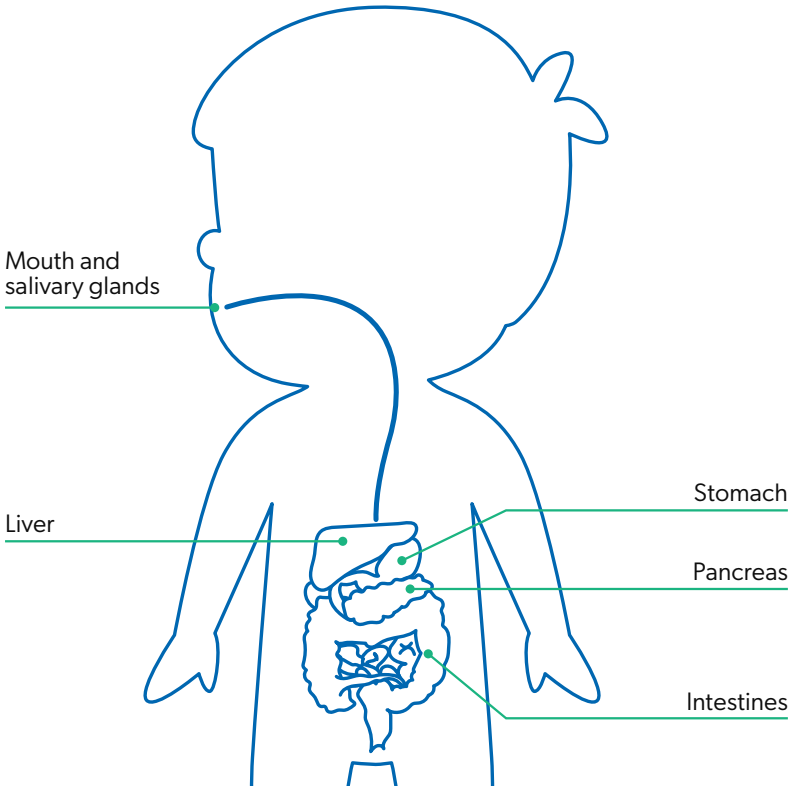
What are triglycerides?

Triglycerides provide energy for your body. Wait a minute, you might be thinking. Isn't that sugar's job? Yes, sugar gives you energy to use right away. Triglycerides are a way that your body packages fats that can be used as energy.

Most of your triglycerides come from the foods you eat. When you are not eating — such as when you're asleep — your liver makes triglycerides that flow into your bloodstream and, eventually, into your cells.

What happens when your triglyceride level becomes too high?

If triglyceride levels in the blood get too high, the blood gets thicker. Instead of flowing like water, it moves more slowly, like syrup. The thicker blood can irritate the pancreas.



The pancreas is an organ found just behind your stomach. The pancreas makes chemicals that help you digest the food you eat. It also makes the hormone insulin. Insulin keeps your blood sugar under control by helping it move from your blood into your cells.

When triglycerides are high, the pancreas can become inflamed (swollen and irritated). That's a serious problem called pancreatitis. Pancreatitis causes severe belly pain. It can also cause nausea and vomiting, which can lead to dehydration. Most children with pancreatitis go to the emergency room, and often need to stay in the hospital for treatment.

Can high triglycerides cause other health problems?

Unfortunately, yes. Besides pancreatitis, high levels of triglycerides can cause you to become overweight or obese. Triglycerides can also affect your liver.

Part of the liver's job is to help clean the blood. When triglycerides are high, your liver tries to help by collecting a lot of the triglycerides from your blood. It's like the closet in your room where you toss a lot of your extra stuff until it's super full. Eventually, your liver gets stuffed with triglycerides. Too much fat in the liver is known as **steatosis**. When steatosis happens, the liver can become irritated and may start showing signs of scarring. That is a condition called **steatohepatitis**. These changes in your liver could make it harder for your body to use sugar properly, increasing the risk of pre-diabetes or diabetes.

steatosis (stē-ə-ˈtō-səs)

Steatosis simply means extra fat in the liver. When doctors talk about steatohepatitis, it means that the extra fat has irritated the liver. This irritation can lead to scarring and serious liver damage.

Pancreatitis (pan-krē-ə-ˈtī-təs)

Pancreatitis is inflammation (swelling and irritation) in the pancreas. It's a serious condition that needs to be treated in the hospital.

Problems like steatohepatitis and pancreatitis can occur in kids and teens, as well as adults. There is growing evidence that high triglycerides might also increase your risk of having clogged blood vessels and heart disease when you become an adult. As you'll learn, though, you can lower your triglycerides and risk by adopting a healthy lifestyle.

What makes triglycerides get too high?

There are three main reasons your blood triglycerides might be too high:

Diet

For most people, high triglycerides are caused by the foods they eat. Foods that are high in fat raise your triglyceride levels the most. Examples of those fatty foods include pizza, cheeseburgers, fries and baked goods. Foods high in sugar, such as sugary drinks and desserts, can also raise triglyceride levels.

One way to help lower your triglycerides to healthy levels is to eat fatty foods only in moderation, and avoid high-sugar foods and beverages. But you'll need to be consistent. The goal is to keep making healthy choices from now on, even when you become an adult. With practice, you'll learn which foods are healthier choices when you are hungry.

Medical conditions and medications

Some medical conditions, such as thyroid, liver or kidney problems, can cause high triglycerides. Some medications can also make triglyceride levels go up. If your triglyceride levels are high, your doctor might do some tests to find out whether it's caused by a health problem or by medicines you're taking.

Genes

Sometimes high triglycerides are caused by changes in your genes. In other words, it's a trait passed down from your mother, father or both. This is a condition called **familial chylomicronemia syndrome** (or FCS for short). A similar condition, called multifactorial chylomicronemia syndrome or MCS, is also caused by a genetic predisposition. However, in MCS the triglyceride levels may be moderately elevated unless a person also becomes overweight/obese or develops prediabetes/diabetes or other health conditions.

Familial chylomicronemia syndrome

(fə-ˈmil-yəl kī-lō-ˈmī-krə-ˈnē-mē-ə sin-ˌdrōm)

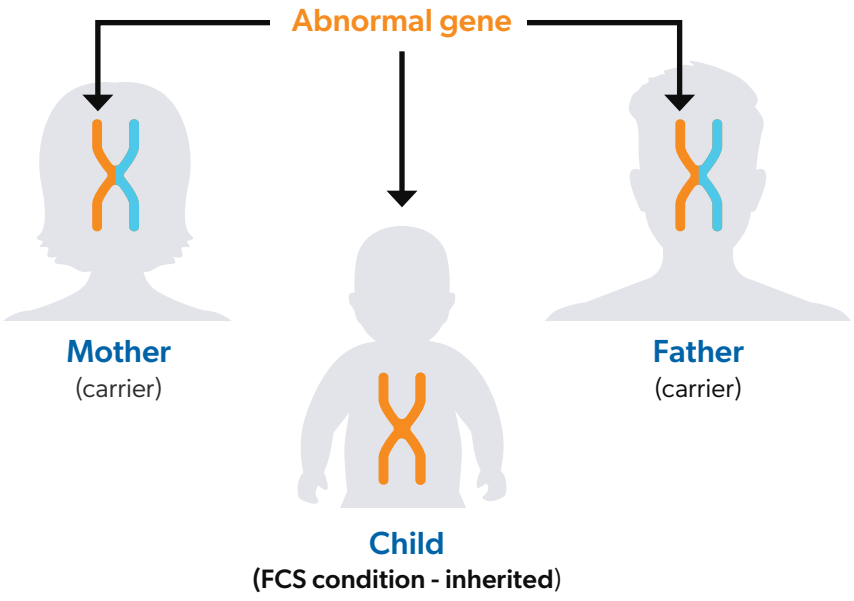
A condition passed down in families that causes triglycerides levels in the blood to get too high.

In all people with FCS and in many with MCS, triglycerides can't enter cells normally, so they build up in the blood. But these are uncommon conditions. Most people with high triglycerides don't have FCS and only about one out of four have MCS.

How is FCS inherited?

Most children who have FCS inherit it from both of their parents, even though neither their mother nor their father has FCS. Genetic traits are passed along in several different ways from parents to their children. You get half your genes from your mother and the other half from your father. Those genes determine everything about you, like the color of your eyes and the size of your feet.

Your parents each pass down a gene that controls how triglycerides flow into your cells. If your mom or your dad has one copy of the gene in their body, they're called a carrier. They won't have FCS, but they can pass it on to a child. If both your parents are carriers, they can both pass down the gene for FCS. If you inherit two copies — one from each parent — you'll have FCS. In case you were wondering, this type of inheritance is called recessive. Recessive conditions don't show up unless you have one copy from each parent.



How do you know if you have FCS?

Your health care team will ask you lots of questions about how you eat and how often you exercise. They'll also want to hear about whether you or your relatives have had any other health problems, including problems like pancreatitis, diabetes, thyroid disease, heart attack or stroke.

Your health care team will test you to see if you have any medical conditions that might cause you to have high triglycerides. They might also give you genetic tests to see if you inherited FCS.

Your doctors will probably recommend that you change the way you eat and get more exercise. After a few months, they'll test your blood again to see if your triglyceride levels have gone down. If you have FCS and you have followed your health care team's advice, you should notice a decrease in your triglyceride, although your levels will likely still be higher than normal. To be successful in these goals, you will need to carefully follow a low-fat and low-sugar diet and get plenty of physical activity.

How do you lower your high triglycerides?

Some things you can change, like what and how much you eat. Some you can't, like having FCS. The good news is that no matter what is causing your triglyceride levels to be too high, there are ways to make them lower.

If you have FCS, the most important thing you can do to lower triglycerides is to follow a special diet. The best things you can do are:

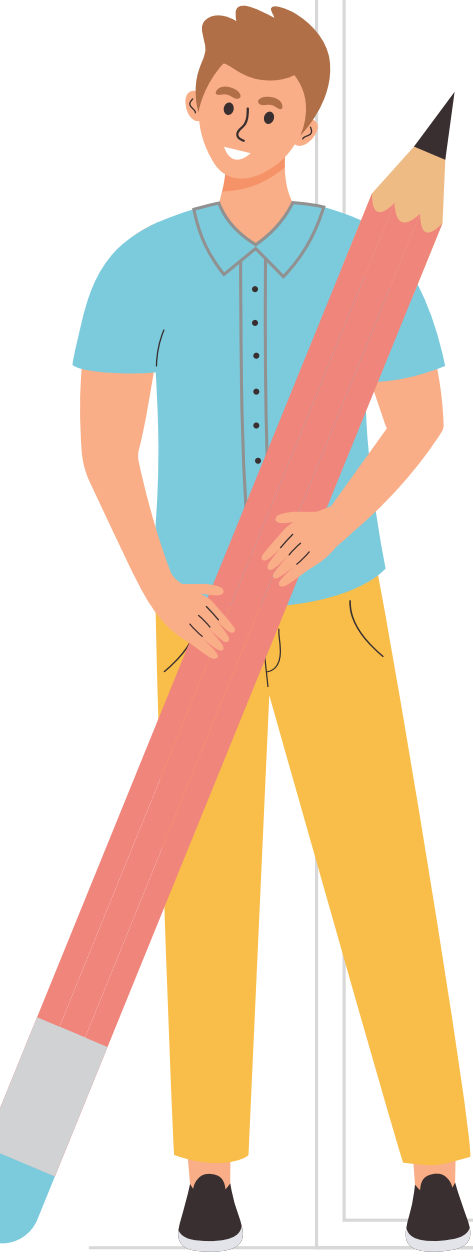
- Follow a diet low in fat and avoid too much sugar. Talk to your dietitian about how many grams of fat you should have each day.
- Get plenty of exercise — at least 30 to 60 minutes of medium to intense physical activity most days of the week.
- Keep your weight at a healthy level.
- Don't smoke, vape or use tobacco products.
- Avoid alcohol and some medications that increase triglycerides. Your health care team can tell you which ones to avoid.

Making these change can make a big difference in triglyceride levels. It sounds easy on paper, but changing your habits takes time. If you have patience and stick with it, those choices become easy. Your health care team can help you make a plan and set goals.

Currently, medications aren't very helpful for lowering triglycerides in people with FCS and many with MCS. Still, some medications and dietary supplements may be helpful for some children. Your health care team will talk to you about those options and if they're right for you. They'll also let you know about any new medications to lower triglycerides that become available in the future.

It's tough to find out you have a genetic condition like FCS. But with support from your health care team and family, you can deal with triglycerides and live a healthy life.

Quiz time!



1. True or false: Triglycerides are a type of sugar.

   - ○ True
   - ○ False

2. High triglycerides can harm the:

   a. Pancreas

   b. Liver

   c. Both the pancreas and the liver

3. What is the best way to lower high triglycerides?

   a. Eat a low-fat diet

   b. Eat a high-fat diet

   c. Eat a high-sugar diet

1. False, Triglycerides are a type of fat
2. c. Both the pancreas and the liver
3. a. Eat a low-fat diet

Dig deeper

Can you spot the fatty foods? Here's your chance to test some of the foods in your kitchen to find out which contain fat. You'll need:

- A piece of white paper
- A pencil
- Six different foods, such as potato chips, lemons, butter, milk, cookies, carrots and apples

1. Draw six circles on your paper. Label each one with the name of a different food.
2. One at a time, rub the food around its spot on the paper.
3. Wait 30 minutes, then take a closer look.
4. Which spots have dried? Which look greasy? The grease you see left behind is evidence that there's a lot of fat in that food.

Parents' corner

It can be upsetting to find out your child has high levels of triglycerides, especially if it's caused by an inherited condition like FCS and MCS. But when these conditions are diagnosed and treated early, you can decrease the chance of certain health problems. By making changes to your child's diet and exercise habits, you can do a lot to help your child lower his or her triglyceride levels.

Many parents wonder if there's a medication to lower triglycerides. There are some medications and supplements that might help, but they aren't always that useful in people with FCS. Ask your health care team if these medications would be helpful for your child. If they recommend them, ask about possible side effects and the correct way to take the medication. Finally, be sure to ask about the cost. Some medications and supplements can be expensive and aren't always covered by insurance.

What can you do?

Wondering if you should have your child's triglycerides tested? The tests can be done at any age. If possible, it's best to test triglycerides after your child has been fasting (not eating or drinking) for at least nine hours. Triglyceride tests are recommended for any child who:

- Has unexplained episodes of abdominal pain.
- Has a parent or other family member who has high triglycerides or takes medication to l ower triglycerides.
- Has a parent or family member with a history of pancreatitis.

Chapter 6:

Overweight and obesity

Habits and health

As you get older, a lot of things change. You get smarter, for one thing. You learn new skills, like riding a bike or using a computer. Your body also starts to change. In your teens, you'll probably have a growth spurt, and you might get taller all of a sudden.

As you grow taller, you'll also gain weight. That weight helps provide the energy you need as you grow. Gaining weight is normal. But sometimes, children gain too much weight, too quickly. Doctors use growth charts to monitor your height and weight to track how you're growing.

When a child or an adult has more weight than they should, doctors describe it as being overweight or having obesity.

It's important to know that your doctor doesn't use words like "overweight" and "obesity" to judge or embarrass you. A person's weight can be a factor in their overall health. If a person has more weight than their body needs, it can cause health problems like high blood sugar, high cholesterol and high blood pressure. If these conditions persist, they can lead to heart disease in adulthood. Maintaining a healthy-heart lifestyle is one of the best ways to prevent problems as you grow older. To talk about how you can stay healthy, your doctor might need to talk to you about your weight.

Obesity (ō-ˈbē-sə-tē)

Obesity is a condition in which a person has more weight than their body needs. That weight is stored as fat deposits in the body. Over time, obesity may cause health problems.

What causes obesity?

If you're overweight or have obesity, you're not alone. Being overweight is very common, in both kids and adults.

There are a lot of things that can lead children to gain too much weight. Like your family, for example. People come in all shapes and sizes, and body size can run in families. Some children might gain too much weight because of a medical condition or the medications they take. A checkup with your doctor and a few simple tests can usually tell if a medication or medical condition is causing you to gain weight.

Your habits also play a big role in how much weight you gain. In many cases, children have extra weight because they eat more calories than their body uses every day. A calorie measures how much energy there is in the foods you eat and the drinks you sip.

Calories (ka-lə-rēs)

Calories are a measure of the amount of energy in the foods and drinks you consume. Your body uses calories when you do things like walk, play, lift your backpack or breathe! It's important to give your body enough calories for the day, but not more than what it needs.

The more active you are, the more calories your body uses. If you go for a long bike ride or play a game of basketball, you burn a lot of calories. If you sit in front of the TV all afternoon, you burn a lot less.

Different children use different amounts of calories each day. The important thing is to listen to YOUR body. Eat when you are hungry (and not because you're bored, stressed or sad). And move your body with lots of fun activities!

How do you know if your weight is healthy?

Most people check their weight by stepping on a scale, like the kind you might have in your bathroom. Doctors use scales, but they also track your weight with a measurement called body mass index, or BMI. Your BMI is a good way of determining how much of your body is fat. But it is not a perfect measure. Boys and girls who are athletic, for example, may have a high BMI because of increased muscle, not fat. Your doctor tracks your BMI over time; it can show if you're giving the right amount of calories to your body. Ask your doctor for your most recent BMI if you're curious!

Your body normally has the right proportion of muscle and fat to keep you healthy. This number will change as you grow. Unless you're very muscular, a BMI that is too high for your age and sex, generally means that your body has extra fat.

How to calculate BMI

To find your BMI, first you will need to measure your height and weight

Start by taking off your shoes to measure your height. Stand up straight with your feet flat on the ground. Stand against a rigid surface, like a wall or a doorway. Use a pencil to draw a small mark at the top of your head. Step away and measure the distance between the floor and your pencil mark with a tape measure. This is a good estimate of your height.

Next, step up on your bathroom scale and see how much you weigh. You can use English units (like pounds and inches) or metric units (like kilograms and centimeters). Just don't mix the two!

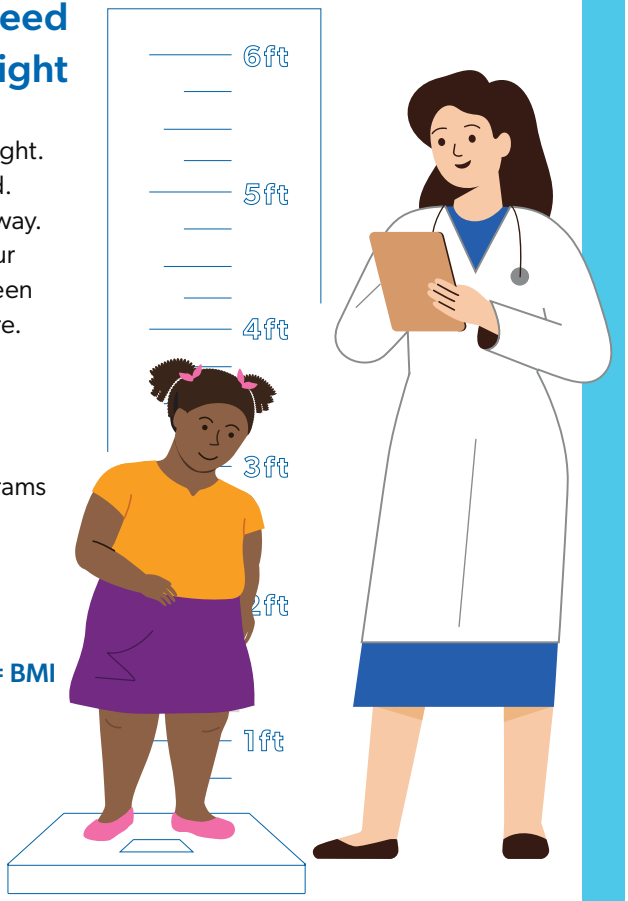
If you like math, you might try calculating your own BMI. Here's the formula:

Weight (in pounds) ÷ Height^2 (in inches) x 703 = BMI

For example, if you weigh 60 pounds and are 42 inches tall, your BMI is

60 ÷ (42 x 42) x 703 = 24

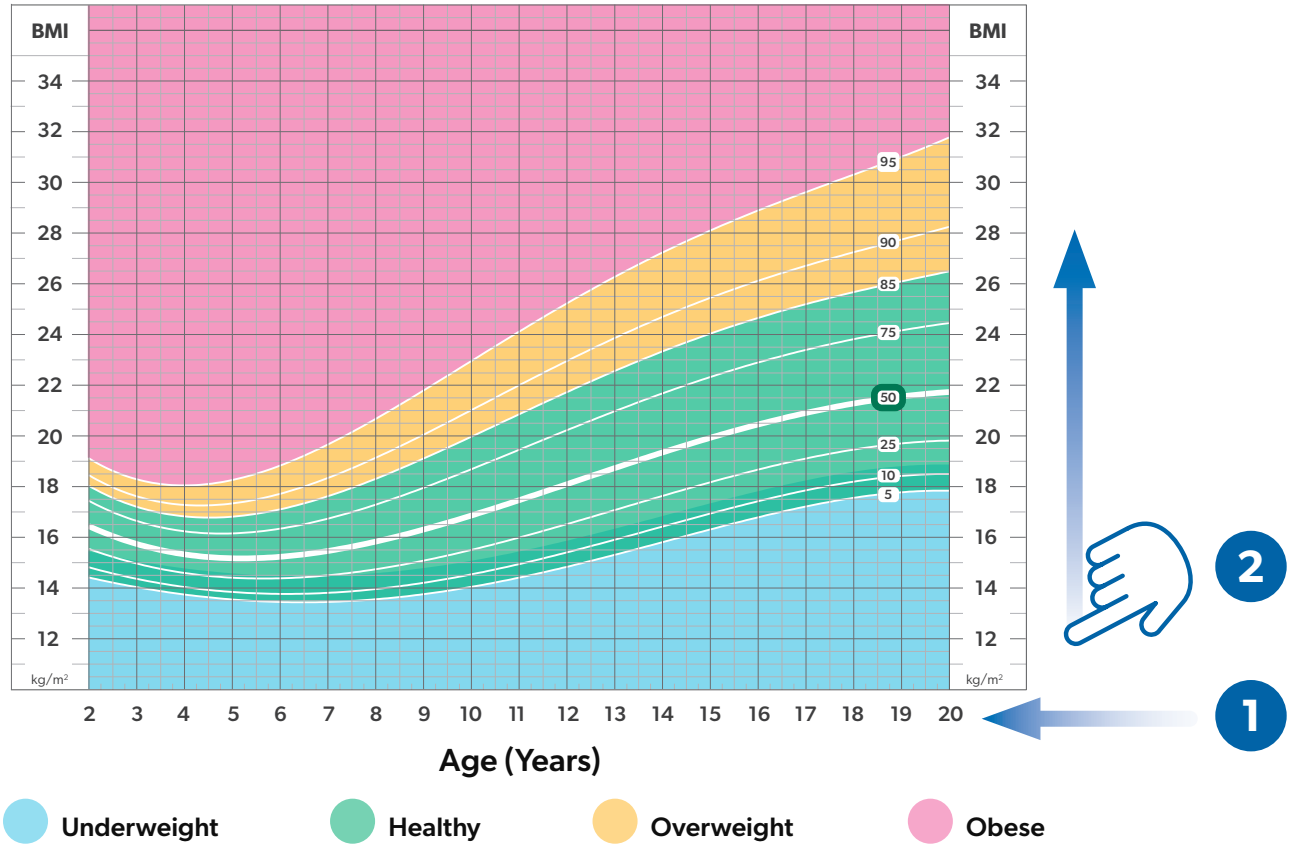
You can get online help at **cdc.gov**. Just search for "**BMI calculator**."



OK, so what does your BMI mean?

Your BMI tells you if your body has a healthy amount of fat compared to other kids your age. BMI charts are mapped differently in boys than in girls, so make sure you look at the right chart below.

U.S. BMI-for-age percentiles: Girls, 2-20 years

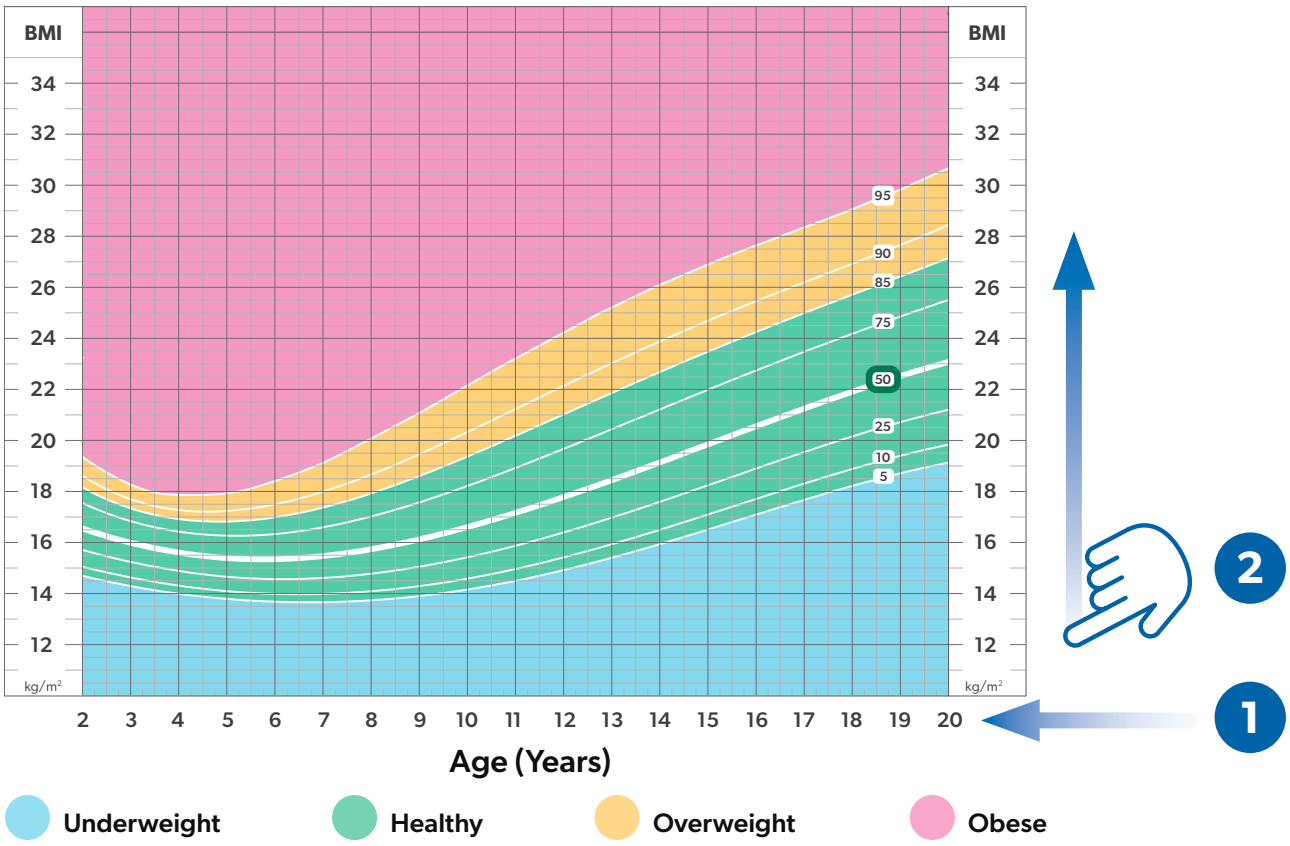


It looks a little complicated, but never fear! It's not as confusing as it looks.

1 **Find your age on the bottom row.**

2 **Then move your finger up until you reach the line linked to your BMI number. This will show your BMI category.**

U.S. BMI-for-age percentiles: Boys, 2-20 years



Most kids are somewhere around the green zone. This is referred to as the "50th percentile." (Can you find the 50th percentile on the charts above? If not, ask your parent or a friend to help you.) The green section on the chart is considered healthy weight.

Kids who are in the blue section weigh less than most kids their age. They are considered underweight.

Kids in the yellow section are overweight. Kids in the pink section have obesity.

BMI isn't a perfect measure of how healthy you are. But it's a useful tool that your doctors can use to estimate your risk for problems like heart disease and Type 2 diabetes.

Does overweight or being obese equal unhealthy?

Not always! And it doesn't mean you've done something wrong. But it is something to pay attention to because extra weight can cause health problems. Having more weight than you need can cause your blood cholesterol and sugar levels to go up, which can lead to health problems as you grow older. The pressure in your blood vessels can sometimes become too high as well.

Not everyone with a BMI in the overweight or obese category is unhealthy. But in some children, being overweight can lead to problems with the heart and blood vessels when they become adults. Adults who are obese have a much higher risk of heart problems.

If health conditions like diabetes and heart disease run in your family, it's even more important to try to stay at a healthy weight. Making smart food choices and being active every day can help you stay healthy.

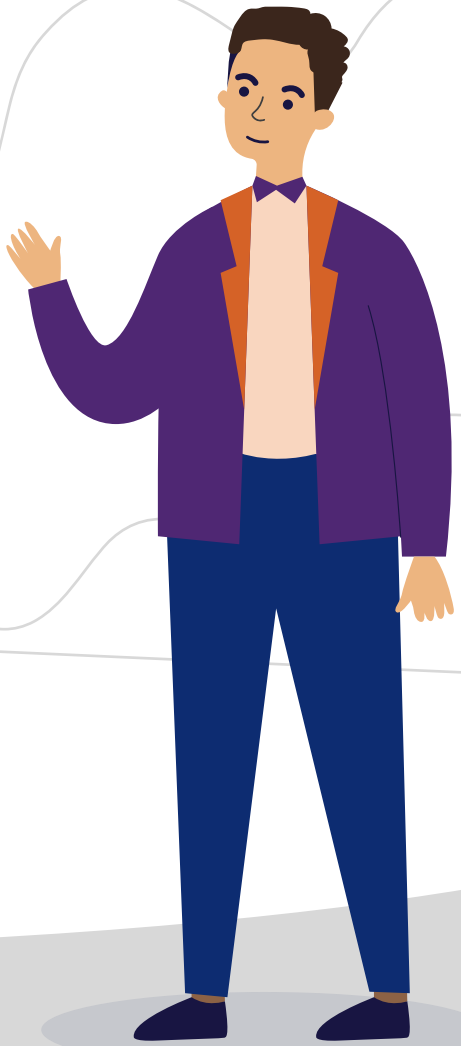
You'll learn more about how to make smart food and exercise choices later in this book. Your health care team can help you understand what foods, snacks and drinks are best for you. They can also give you tips on what physical activities can help keep your heart strong.

Good advice

Moving your body helps you stay strong and healthy. Experts say kids should get about an hour of vigorous physical activity every day — vigorous enough to make your heart rate and breathing speed up. That might sound like a lot, but it doesn't mean you need to spend an hour running laps or doing push-ups. Physical activity should be fun!

Try these activities to get moving:

- Turn up the music and have a dance party with your family or friends.
- Go to the playground to climb, slide and swing.
- Set up an obstacle course in your yard or a local park. Get a timer and see which of your friends can finish fastest!
- Go for a hike in the wilderness. (Bonus points if there are hills to climb!)
- Play an old-school game, like hopscotch or jump rope.
- Learn a new sport, like basketball, soccer or tennis.



Quiz time!

1. _____ are a measure of the energy in foods.

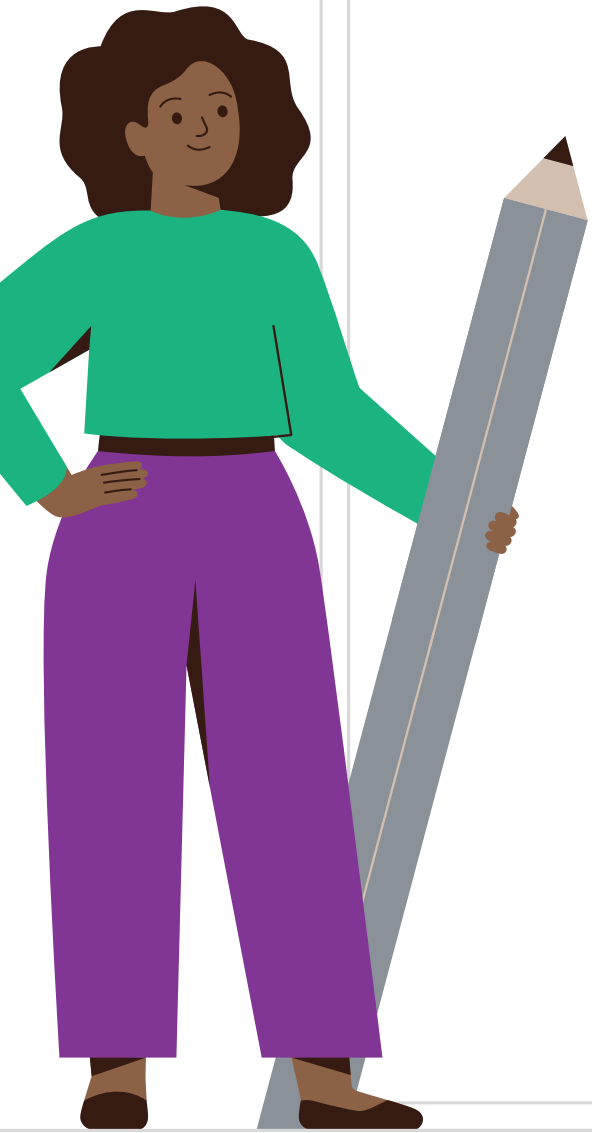
2. Doctors use a measurement called _____ to estimate if your body has a healthy amount of fat.

3. _____ is a condition in which a person has extra weight.

4. True or false? Having overweight or obesity can harm the heart and blood vessels over time.

   ○ True

   ○ False



1. Calories
2. Body mass index (BMI)
3. Obesity
4. True

Dig deeper

Snack foods like chips, cookies and candy usually have a lot of calories. The problem is, they don't fill you up. That means you can end up eating a lot more calories than your body can use. Foods like fruits and vegetables are usually more filling and have fewer calories, too. Plus, they have good-for-you vitamins and minerals. Trying lots of different veggies and fruits can help you learn which ones you like best, and which aren't your favorite.

Time for a taste test! Have you ever had a kiwi? How about a pluot (a cross between a plum and an apricot)? Pick out four or five new fruits you haven't tried before. Slice them up so everyone in your family can take a bite. Rate each fruit from 1 (no thanks) to 10 (super delicious). Which do you like best? What's the family favorite? You might find some yummy healthy new snacks to add to your lunch box.

Parents' corner

Talking about weight can be a really touchy subject. To prevent an unhealthy focus on weight, you might try talking about healthy habits and ways to keep your child's body healthy instead. Getting the entire family involved in healthy habits can make it easier to help your child achieve a healthy body without placing too much focus on weight itself.

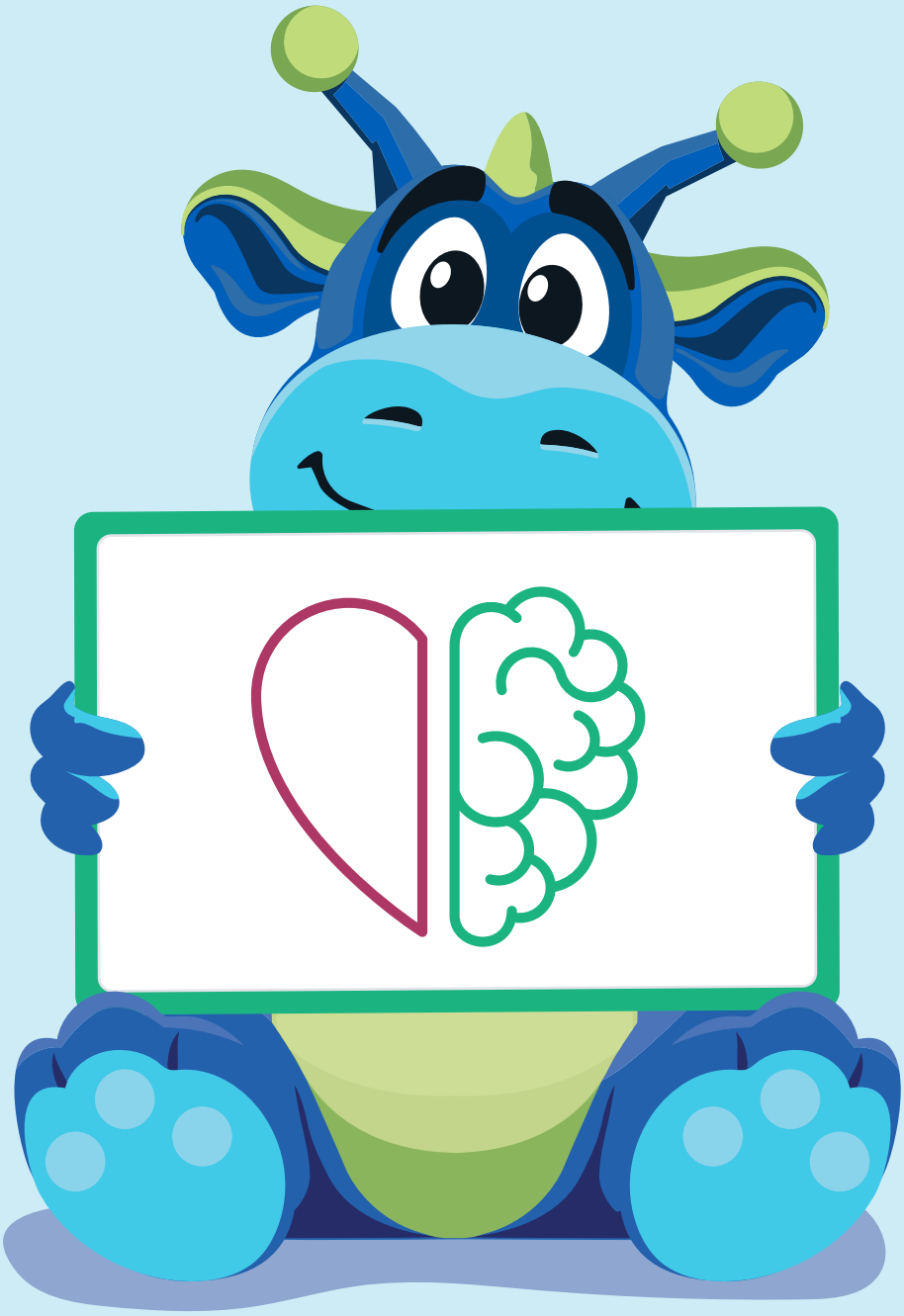
What can you do?

- Make sure your child knows that you love them no matter what size they are. Your goal is to help them to live a long, healthy life.
- Focus on healthy habits more than a number on the scale.
- Remind your child that food isn't bad. Instead of talking about going on a diet, focus on choosing more nutritious foods. It's important to make sure your child gets enough nutrients to develop and grow.
- Look out for signs of a possible eating disorder, such as skipping meals, avoiding whole categories of foods, or being preoccupied with weight and food.
- Ask your child how you can support them as they develop healthier habits.
- Team up to develop good health habits for the entire family. Work together to set goals and make healthy choices.

Chapter 7:

Other health conditions:

Habits and health

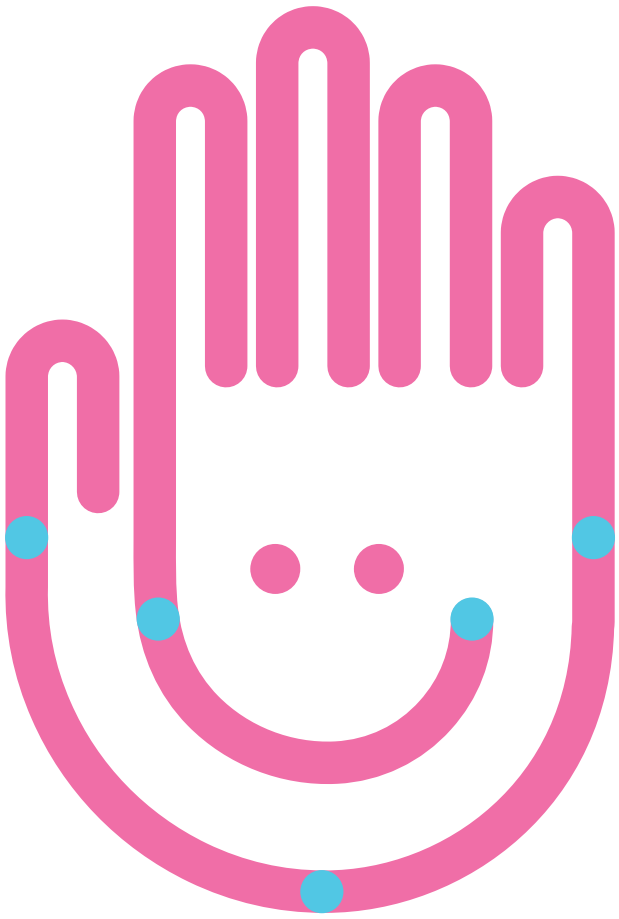


Some things just go together (like peanut butter and jelly). Unfortunately, some health problems also go hand in hand.

Problems like high blood sugar, high blood pressure, high cholesterol and obesity often go together. Alone or together, they can lead to heart disease. Heart disease affects the heart and the blood vessels. If it isn't treated, heart disease can cause a lot of serious problems.

Heart disease isn't the only reason to pay attention to blood pressure, blood sugar, cholesterol and weight. When those problems are ignored or not treated properly, they can sometimes lead to even more health problems.

In this chapter, you'll read about some of the problems that are linked to extra weight, high blood pressure, high blood sugar and high cholesterol. Hopefully, you won't ever have to deal with most of these problems. But by learning about them, you can be on the lookout for signs you might be starting to have problems. Better yet, you can take steps to prevent them.



Problems linked to high blood sugar

If you're overweight or have obesity, you're at risk of developing Type 2 diabetes (T2D). Have you heard of T2D? Your pancreas makes a substance called insulin. Insulin helps your cells take up sugar from the blood. People with diabetes can develop insulin resistance. That means their insulin isn't working the way it should. As a result, sugar can't get into the cells easily, causing the amount of sugar in the blood to get higher than it should.

Over time, high blood sugar can damage the blood vessels that supply your heart, brain and other important organs. If you keep your blood sugar under control with a healthy lifestyle and medication, you can delay — or better yet, avoid — a lot of these problems.

Here's a look at the most common problems that occur in people with high blood sugar.

Insulin resistance (ˈin(t)-s(ə-)lən ri-ˈzi-stən(t)s)

Insulin works like a key to open cells and let sugar inside. In people with insulin resistance, the key stops working. Sugar builds up in the bloodstream because it can't get into the cells.

Pre-diabetes and Type 2 diabetes

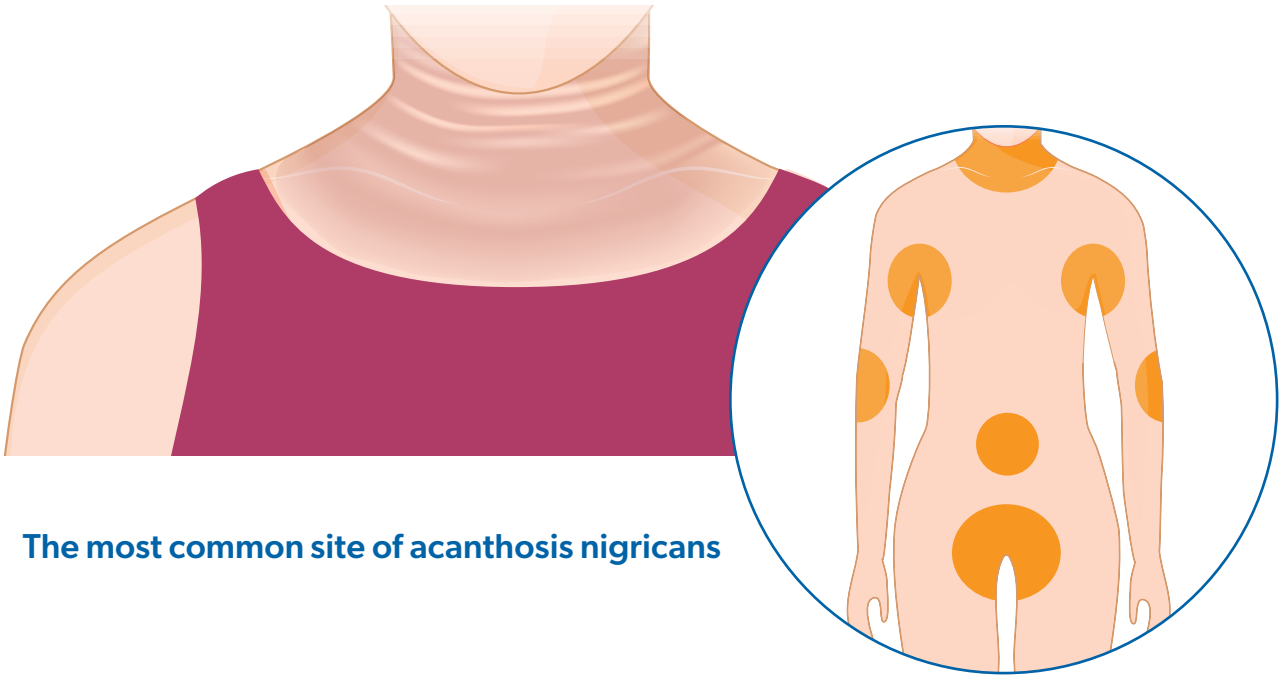
T2D develops over time. Usually, people first get something called pre-diabetes. If you have pre-diabetes, your blood sugar levels are higher than they should be. If it's not treated, it can turn into T2D after a while.

Many (but not all) children with pre-diabetes have extra weight or obesity. By learning to eat healthier foods and getting more exercise, you can improve your health in a big way.

If you have extra weight or obesity, it's especially important to monitor your A1C levels. This is a test that estimates your average blood sugar over the last 6-8 weeks. Ideally, this test should be less than 5.7%. Your A1C will help your health care team track what's going on with your blood sugar. Your health care team can also give you advice about the best way to lose weight safely.

Acanthosis nigricans

When children gain extra weight, they can develop patches of skin that are dark and thickened. It usually happens around the neck, under the armpits and around the waist. This is called acanthosis nigricans, it's a sign when your body is becoming insulin resistant. Acanthosis nigricans isn't something you can wash off or spread to other people, and it isn't harmful to your skin. But it can be a warning sign that you might be developing pre-diabetes. So if you see it, it's a good idea to show your doctor.



The most common site of acanthosis nigricans

Retinopathy

Sometimes, diabetes can cause damage to the eyes. This is called retinopathy. If it isn't treated, it can lead to vision problems. For people with diabetes, keeping blood sugar levels in a healthy range can help prevent eye problems.

Kidney disease

Your kidneys remove waste from your body. They play an important role in helping you stay healthy. If blood sugar levels are high, it can damage the blood vessels in your kidneys. When this happens, protein might show up in your pee. You can't see the protein in your pee, and at first, you probably won't notice any symptoms. That's why it's important for doctors to test your urine to look for protein — especially if you have T2D. If your health care team sees signs of kidney disease, they can recommend the best way to treat it.

Blood vessel problems

If people with T2D don't get proper treatment, the disease can damage their blood vessels. That can increase the chance of problems like a heart attack when you're an adult. Blood vessel damage can make blood flow more slowly through the blood vessels. Sometimes, that causes sores on the feet, and it might hurt to walk.

These problems usually don't happen until a person has had diabetes for a while. They're more common in adults, not kids. But blood vessels damage can start when you're younger. That's why it's important to take steps to prevent T2D now. If you develop pre-diabetes or T2D, you should work with your doctor to treat it.

Inflammation (ˌin-flə-ˈmā-shən)

Inflammation causes redness and swelling. The body creates inflammation when you're sick or injured to help you heal. It's helpful for a little while. If you have a lot of inflammation, or it's been present for a long time, it can cause health problems.

Problems linked to high blood fats

Just like high blood sugar is often found in children with obesity, so is too much fat in your blood. Let's look at some common problems linked to blood fats.

Coronary artery disease

High levels of cholesterol can clump together and clog blood vessels. If it goes on for many years, it can cause problems like chest pain, shortness of breath and damage to the heart. The buildup of cholesterol deposits in the heart's blood vessels is called coronary artery disease.

Pancreatitis

Triglycerides are another form of fat that may build up in the blood. High levels cause the blood to become thicker. That makes it flow more slowly. As the thicker blood travels through an organ called the pancreas, it causes inflammation. Inflammation causes redness and swelling. When inflammation happens in your pancreas, it's called pancreatitis.

Pancreatitis is a serious condition that needs to be treated in the hospital. To avoid it, you should avoid high-fat foods, high sugar foods and sugary beverages, get plenty of exercise and try to maintain a healthy weight. Some medicine also can increase triglyceride levels. Your health care team will tell you which medications you should avoid and the best way for you to prevent pancreatitis.

Other problems linked to extra weight and obesity

You know that having extra weight or obesity puts you at risk of having high blood sugar and high cholesterol, often leading to heart disease and blood vessel problems. There are other problems that can happen if you have extra weight. It's good to learn about these problems so you can take steps to prevent them. Let's take a look.

Fatty liver disease

Having extra weight or obesity increases the amount of fat in your blood. As blood flows through your body, the extra fat can get trapped in your liver. That can make the liver get bigger. Sometimes, it also causes inflammation in the liver. Over time, inflammation of the liver can cause scarring. That can keep the liver from working the way it should.

Obstructive sleep apnea

Lots of people snore at night. Are you one of them? Snoring by itself isn't bad. But sometimes, snoring is a symptom of a condition called obstructive sleep apnea. If you have apnea, you stop breathing for short periods when you're asleep. You start breathing again after a few seconds. But this can happen over and over, all night long. It happens when the airway gets squished during sleep. That's often caused by extra weight.

People with obstructive sleep apnea are often tired during the day because they aren't getting deep sleep at night. Your doctor may recommend a sleep study to learn how well you sleep and how your breathing changes throughout the night. Losing weight can sometimes help, and there are also small breathing machines you can wear at night to make breathing easier.

Vitamin D deficiency

Vitamin D helps your body grow and helps build strong bones. Sometimes, people who have extra weight can have lower levels of vitamin D than they should. Your doctor might check your vitamin D level. If it's low, your doctor might recommend you take a vitamin D pill to make sure you get enough.

Hormone (ˈhȯr-ˌmōn)

Hormones are substances made by the body. They send messages through the blood to control the body's functions, such as growth and puberty.

Bone and joint problems

Having extra weight puts stress on your bones and joints. Sometimes the stress on the bones and joints can even make it hard to walk comfortably. Losing weight can help take away some of the stress. Your health care team can also talk about ways to deal with the problem to make it easier to walk and be active.

Negative emotions

Some people who have extra weight or obesity might feel uncomfortable or sad. They might be teased or bullied by others. If you feel sad or angry, or you're being teased or bullied, talk with your parents, doctor or another trusted adult. They can offer suggestions to help you work through your emotions and start to feel better.

Polycystic ovarian disease

Ovaries are organs that produce hormones and eggs in females. Polycystic ovary syndrome (PCOS) may begin during puberty or later. PCOS happens when a girl's body makes too many male hormones. The ovaries normally produce a small amount of those hormones. In girls with PCOS, they just make a little too much. That can cause problems like extra hair and acne. It can also cause changes with your period.

PCOS is more common in girls with extra weight or obesity. And it increases the risk of problems like diabetes and heart disease. If you have signs of PCOS, talk to your doctor. Your health care team can help you find ways to manage it.

Think you might have PCOS?

Check the circle if you have any of these symptoms:

- ○ Irregular periods
- ○ Overweight or obesity
- ○ Rapid weight gain
- ○ Oily skin or pimples
- ○ Hair on the face, chest, stomach and back
- ○ Family members with PCOS

The more circles you check, the more likely you are to have PCOS.
Share this with your health care team.

Special testing

Your health care team has a lot of tools and tests to help monitor your health. They can help doctors find out if you are at risk of health problems or have any of the conditions you read about in this chapter. Here's a quick overview of what to expect from some of these tests.

Blood tests

Sometimes, doctors can find out if you have a certain health problem with a simple blood test. If your health care team wants to test for a few different conditions, they can usually do it with just one blood sample. You might need to fast (not eat) before a test. Your health care team will give you instructions about how to prepare. They can also share tips about how to make it less painful and scary.

Imaging

When doctors want to see how your organs look, they might request an image. Images are medical pictures of your heart, brain, liver or other organs. There are different ways to take a medical picture. For example, X-rays use radiation to take pictures inside your body. A tool called an MRI uses strong magnets to snap a photo. And ultrasound uses sound waves. If you have any questions, your health care team can describe the type of imaging you need and how it works.

Ultrasound

Ultrasounds send sound waves into the body. When the waves bounce back, they create a picture of what's inside. If your doctors are worried about extra fat in your liver, they might suggest a liver ultrasound. This test can help show if the liver is healthy. If you have symptoms of PCOS, your doctor might recommend a pelvic ultrasound to look at your ovaries.

During an ultrasound, a technician will put some cold gel on your belly. Then he or she will rub a tool called a transducer across the gel. It usually only takes a few minutes, and it doesn't hurt. Even though it uses sound waves, you won't hear any noise. It uses sound waves that people can't hear — kind of like a dog whistle!

Sleep study

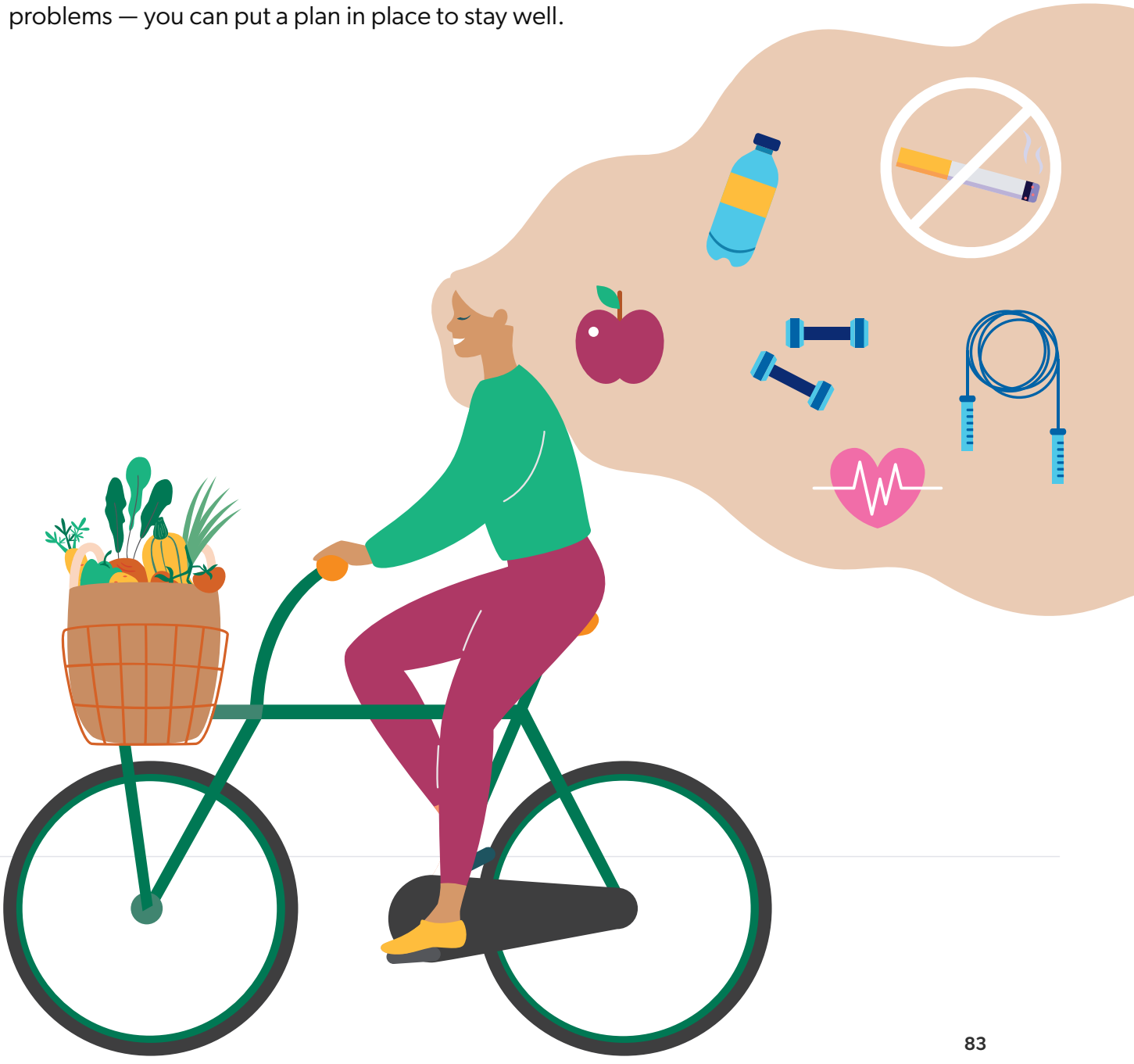
If you have any signs of sleep apnea, your health care team might ask you to get a sleep study. This test is done in a hospital or a special sleep center. You'll probably need to spend the night, but a parent or caregiver can stay with you to keep you company.

After you arrive, a technician will place a special cap on your head. The cap will make a recording of your brain waves while you're asleep. If you have sleep apnea, the brain waves will show a telltale pattern. In the morning, you can take the wires off and head home, good as new!

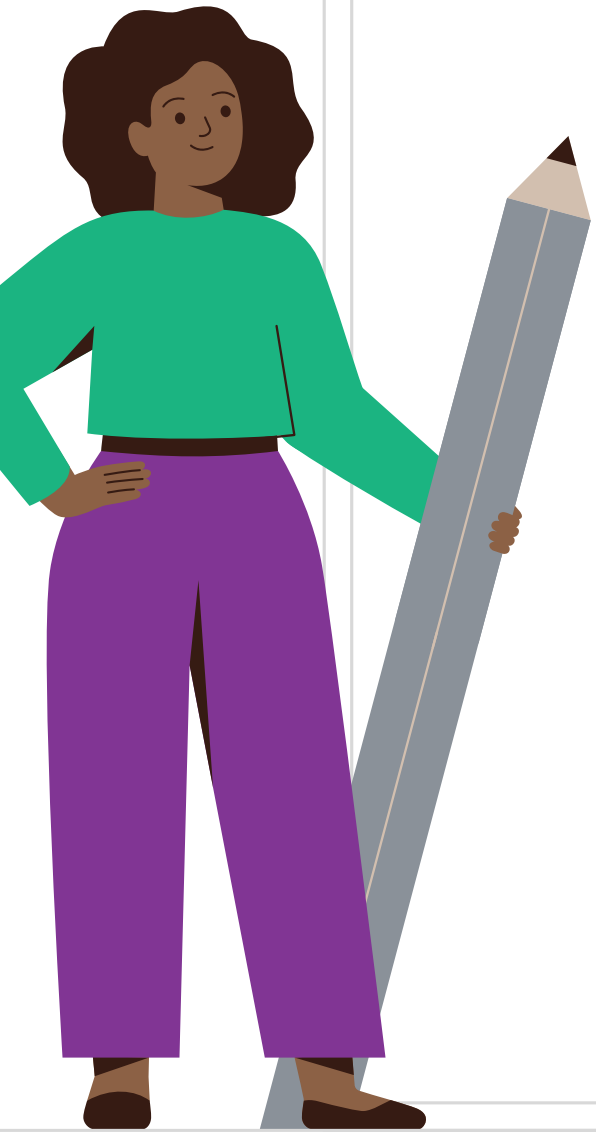
Planning for health

Reading about all these health problems might sound scary. But having a problem like high cholesterol or obesity doesn't mean you'll definitely have any of these conditions. And if you take steps to keep your weight, blood pressure, blood sugar and cholesterol at healthy levels, you can lower the chances that you'll have these problems. Those steps usually include healthy eating, physical activity and sometimes, taking medicine. Another important step: Don't smoke! Smoking is one of the biggest threats to your health. (That includes vaping and being exposed to second-hand smoke from others.)

It's not easy to think about all the things that can go wrong with your health. But the fact is, lots of things can go right! By learning about your health — and possible health problems — you can put a plan in place to stay well.



Quiz time!



1. People with Type 2 diabetes or pre-diabetes develop _____ resistance, causing the amount of sugar in the blood to get too high.

2. Dark patches on the skin, called acanthosis nigricans, can be a sign of:
   a. High blood pressure
   b. Pre-diabetes or diabetes
   c. PCOS

3. True or false: Over time, inflammation can harm your organs.
   - ○ True
   - ○ False

4. Ultrasounds use _____ to take pictures inside your body.
   a. Radiation
   b. Sound waves
   c. Magnetic waves

1. Insulin
2. Pre-diabetes
3. True
4. Sound wave

Dig deeper

For people who have obesity, losing just 5% to 10% of their body weight can make a big difference in health. What does that look like? Let's do the math!

Say you currently weigh 180 pounds. You want to lose 10% of your body weight to become healthier. To find 10% of 180 pounds, divide 180 by 10.

180 ÷ 10 = 18

So a person who weighs 180 pounds needs to lose 18 pounds to lose 10% of their weight. For many people, losing 10% of their body weight can help prevent pre-diabetes from becoming T2D.

Parents' corner

It can be overwhelming to think about all the things that can go wrong with your child's health. The good news is that many health problems can be prevented. If they do occur, most can be successfully treated. Prevention starts at an early stage. Learn heart-healthy habits and make them a part of your family's daily routine. Inherited conditions (like high cholesterol or high blood pressure) can't always be prevented. By adopting healthy habits, you and your children can take charge of your health.

Did you know?

Pre-diabetes comes before Type 2 diabetes (T2D). But it doesn't have to go that way. When you make changes (like reaching a healthy weight, exercising more and eating a healthy diet), you can get rid of pre-diabetes before it turns into T2D.

What can you do?

- Learn about the health conditions that may be caused by extra weight/obesity.
- During regular checkups, talk with your child's health care team to see if they have any concerns about your child's weight or the findings on the physical exam or test results.
- If you have any questions or concerns, be sure to ask.
- Above all, start early. Prevention is always the best option for a long and healthy life.

Chapter 8:

Medical tests:

No studying required!

Do you remember your last visit to your doctor's office? If so, you might remember that there was a lot going on during your visit. You and your family were asked questions like, "How are you feeling today?" Your doctor probably listened to your heart. And during the visit, your doctor might have recommended that you take some tests.

If so, you might have wondered: What's the point of all those tests? In this chapter, you'll learn what kind of tools and tests doctors use to check your blood sugar, cholesterol and blood pressure. You'll also read about what those test results mean and how they can be used to help keep you healthy.

Doctors have a lot of tests they can order to learn more about how your body is working and to help them take care of you. We will discuss four kinds of tests that are helpful.

Anthropometrics

Anthropometrics is just a big word for measuring your height, weight and blood pressure. You might remember a nurse checking these things the last time you went to the doctor. Your height and weight are simple to measure. You've probably measured your own height and weight at home or at school.

Measuring your blood pressure requires a bit more skill, as well as a special tool called a blood pressure cuff. The cuff is put around your arm and it fills with air. It doesn't hurt, but it feels tight. This test measures the pressure inside your blood vessels (the arteries, to be exact). In just a minute or two, the test will let us know your results.

When you're nervous, your blood pressure can go up. A lot of people get nervous at the doctor's office — so their blood pressure might seem higher than it really is. One way doctors find out for sure is by taking it again later in the appointment, when you're a little more relaxed. If your blood pressure is still high, your health care team will talk to you about what you can do to lower it.

Artery (är-tə-rē)

An artery is a blood vessel that carries blood away from the heart. Arteries are hollow tubes that are usually stretchy. High blood pressure, high cholesterol and high blood sugar can damage arteries when you become an adult, making them stiff instead of stretchy.

Blood tests

Getting a poke for a blood test isn't anybody's favorite thing to do. But these tests can be really important for your health. Hopefully, when you understand why they're important, the tests will seem a little less scary. Let's take a closer look at some of the blood tests your doctor might suggest.

Blood sugar

High blood sugar is a troublemaker. It can be a sign of a condition called diabetes. A blood test can measure whether your blood sugar is higher (or lower) than it should be. Blood sugar tests are usually done first thing in the morning, after you have been fasting (that is, before you have anything to eat or drink). When you eat or drink something, it can make your blood sugar rise. A fasting test gives your doctor a better idea of what's going on in your blood.

Your doctor may also suggest a test called hemoglobin A1c, or just A1c. (This test doesn't have to be done fasting, so help yourself to breakfast!) The A1c test gives an average of your blood sugar levels over the past six to eight weeks — kind of like your report card gives an average of your test scores for the grading period.

If those tests show you might have diabetes, other tests can be helpful. One is an oral glucose tolerance test (OGTT). The OGTT tests your blood sugar before and after you drink a special sugary beverage. This test will show how well your body is able to handle sugar. In people with diabetes, blood sugar levels will get high after drinking the special beverage.

Cholesterol and triglycerides

Testing cholesterol is easier than testing blood sugar. It's just one simple blood test that can be done at the same time as your blood sugar tests. You don't need to fast to test your cholesterol, and the test can be done at any time of the day.

Your doctor will probably compare your cholesterol level to other kids your age. Most kids have a healthy blood cholesterol level. For some, it's a little bit high — what's known as "borderline high." For them, cholesterol levels usually get better if they make some changes to their eating habits. Fewer than one of every 10 kids has high cholesterol. If you're one of them, you might need medication to help you stay healthy.

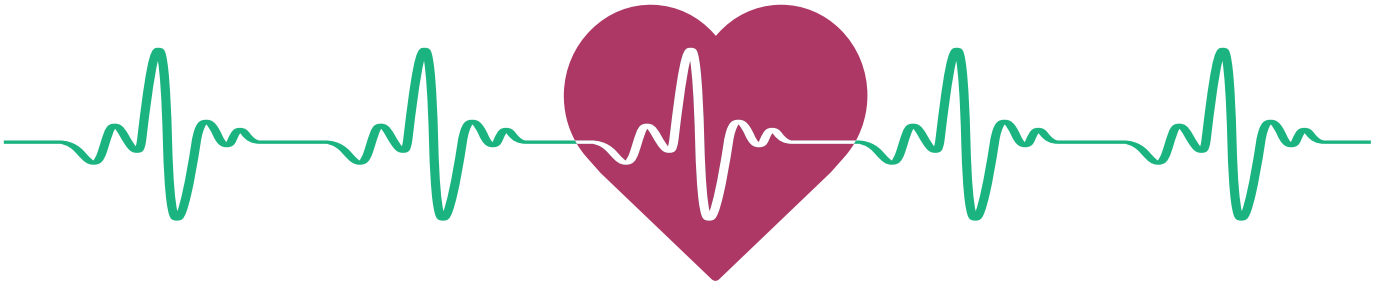
Your doctor might also order a test called a lipid panel. This test measures triglycerides, the other type of fat normally found in your blood. If the level of triglycerides is too high, your doctor may ask you to repeat your blood test after you have been fasting.

Heart and blood vessel tests

Your doctor might also suggest a test to be sure your heart and blood vessels are healthy and working the way they should. Here are few that you might be asked to do.

Electrocardiogram (EKG)

Your heart beats more than 100,000 times a day. Each time it does, it creates a wave. Not like the ones you see when you go to the beach, but an electric wave. That wave causes your heart to beat normally. An EKG is a picture of the electrical wave your heart makes each time it beats. Amazing, isn't it? Normal heart waves are shown below. Believe it or not, doctors can tell a lot about your heart from these wiggly lines!



Chest X-ray

Say cheese! A chest X-ray is nothing more than a picture of your chest. This picture allows your doctor to see the shape and size of your heart. It's helpful for doctors to see how your heart looks. But an X-ray can't tell how well your heart is working.

X-ray (eks-ˌrā)

An X-ray uses a form of radiation to take pictures inside the body.

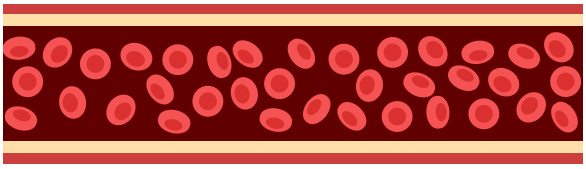
Echocardiogram (ECHO)

You know how bats use sound waves to find their way around? Sound waves from their squeaks bounce off objects around them. The bats use those echoes to make a map of their surroundings so they can find bugs to eat (and avoid bumping into trees). Doctors use this same technique when they want to see how your heart is working.

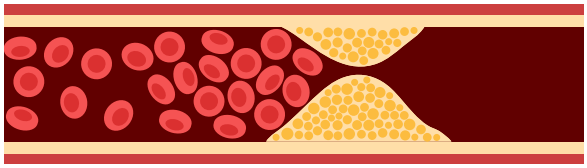
This test is called an echocardiogram, or ECHO. An ECHO bounces sound waves off your chest to make an image of the heart's size and shape. The test also shows how blood is flowing through the heart. Like X-rays, this test is painless. And it's actually pretty cool! You can see the image of your heart pumping during the test.

Carotid intima–media thickness (cIMT)

Have you ever taken a photo in a dimly lit room? Unless you used a flash to add light, your photo probably turned out dark and hazy. Doctors have the same problem when they want to look inside your blood vessels. Doctors like to look inside blood vessels to see how much cholesterol has built up inside them. However, X-rays don't give a clear picture of the space inside the blood vessel. (Instead, X-rays of blood vessels look more like a rope. Interesting, but not very helpful.) Luckily, doctors have a test they can use instead: A test called the carotid intima–media thickness (or cIMT). This test is less common for adults and more often used with children.



Healthy artery with no obstruction, allowing blood to flow freely



An artery "clogged up" from too much cholesterol, reducing normal blood flow

Arteries are tubes made of three layers: an inner layer (intima), middle layer (media) and outer layer (adventitia). Cholesterol can build up between the inner and middle layers. The cIMT bounces sound waves off an artery to measure the space between the intima and the media. It's usually done in an artery in the neck, called the carotid artery. And that's why it's called carotid intima-media! (Makes sense, right?)

The test shows how much cholesterol is between the layers. This is very helpful in children when the amount of cholesterol is still very small. In people who lower their cholesterol levels, the cIMT shrinks back toward its original size. That makes the test helpful for showing whether your treatment is working to keep you healthy.

Genetic tests

You've probably heard about genes — the bundles of DNA that give you traits like hair color or freckles. Genetic tests look at the DNA inside your cells to look for certain changes — such as genes that cause your cholesterol levels to be too high. There are a lot of different kinds of genetic tests. Your doctor will help you decide which tests might be helpful for you, depending on what traits might run in your family.

Most genetic tests are done with a blood sample. But some can be done using saliva (spit) or a swab of the cells inside your mouth. It usually takes a couple of weeks or more to get the results of genetic tests. And you will need the help of your health care team to understand the report. But it can be pretty cool to learn about the unique DNA inside your cells. The results can give you and your family a lot of important information about your health.

Quiz time!

1. The A1c test helps determine if you have high levels of:

   a. Blood pressure

   b. Blood sugar

   c. Cholesterol

2. True or false: You should eat a big meal before a fasting blood test.

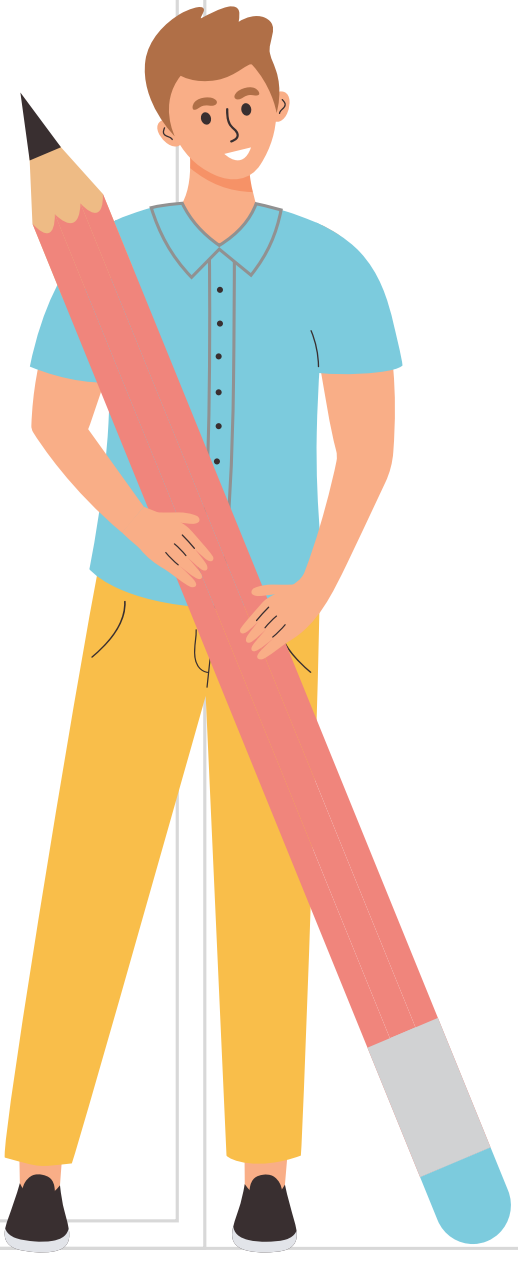
   ○ True

   ○ False

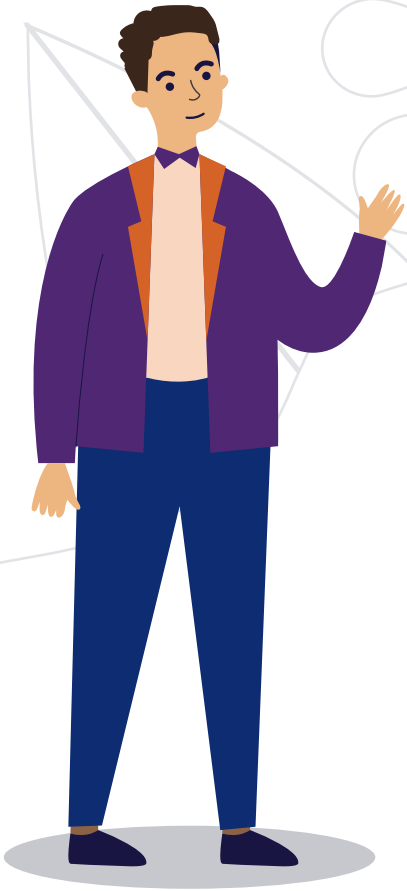
3. True or false: Cholesterol can build up between the layers of the artery.

   ○ True

   ○ False



1. Blood sugar
2. False
3. True



Did you know?

In 1990, scientists set out to map the human genome — the full set of DNA in the human body. It was a big project. They didn't finish their map of the human genome until 2003. Today, we have tests for tens of thousands of genetic changes. And more genetic tests are being developed all the time. (Luckily, doctors only have to test a few genes to find out if someone has genes for high cholesterol.)

Dig deeper

It might seem scary to get your blood drawn. Lots of people — young and old — get nervous when they get a shot or give a blood sample. But those blood tests give your doctors the information they need to help you stay healthy. Try some of these ideas to help you stay calm — or brainstorm some ideas of your own!

- Bring headphones and listen to music during the procedure.
- Drink plenty of water before your appointment. (It can take longer to draw blood if you're dehydrated.)
- Look away. No need to watch if it makes you nervous!
- Take deep breaths to calm yourself before the test.
- Plan a reward to look forward to after your test. Maybe you can go to the movies or stop by the library for some fresh reading material.
- Ask your health care team for more suggestions. Lots of doctors' offices have special ways to make blood tests easier.

Parents' corner

Whenever your child has a doctor's appointment, you probably hear that famous question: "Am I going to get a shot?" It's important to give your child an honest answer — even if that answer is "I'm not sure." Shots can be scary for kids (and even for a lot of adults!). But by talking it over, you can ease your child's stress and help them get the care they need to stay healthy.

What can you do?

- Get the facts: If your child needs a blood test or other procedure, ask the health care team to explain to you and your child why you need it and what to expect. The experience might seem less frightening if they understand what's going on and why.
- Time your test: If your child needs routine blood tests, you might find it helpful to have it done before an upcoming visit to the clinic. That way, your child won't be so frightened during your meeting with your doctor. You and your child can focus on discussing the test results and asking questions.
- Choose your words: Use less scary words like "pinch" or "poke" instead of "pain" or "shot."
- Tell them you understand: Don't tell your child they're being silly or making a big deal of nothing. Instead, you might say something like, "I know you're worried. It will be over quickly and I'll be right here holding your hand."
- Ask for help: If your child is scared, ask your care team to take steps to make the process easier. They may be able to use numbing medication to reduce the pain, for example. Or they might have books or toys available to distract your child during the procedure.

Chapter 9:

Test results:

What do they mean?

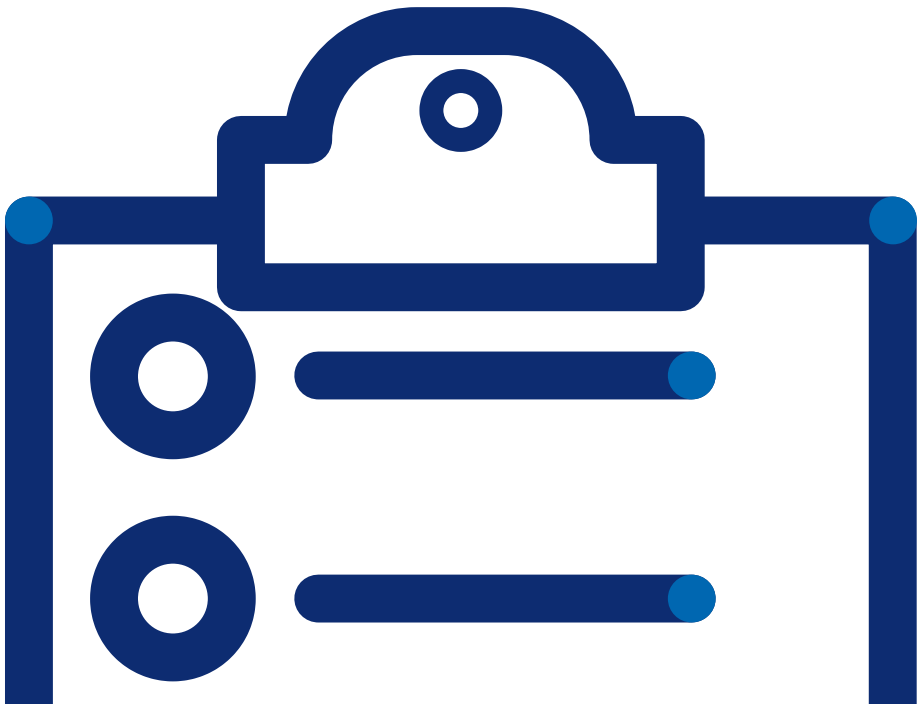
When you have medical tests done, your doctors will talk to you about the results and what they mean. Still, it's helpful for you to know a little bit about the tests.

Your health care team will probably repeat some of your blood tests over time. Why do you need to get tested over and over? The tests will show how things are changing over time. Making changes — like eating healthier foods, exercising more or taking medicine — can lead to changes in your body that help you stay healthy. The tests will show whether those types of changes are helping. If you're taking medications, the tests can help your health care team make sure the medicines are doing their job. And they can help you set goals for becoming healthier.

For example, you probably know it's important to keep your weight and blood pressure in the healthy zone. But what counts as a healthy weight? What should your blood pressure be? And what about blood sugar? And cholesterol?

It feels like a lot to keep track of. With help from your health care team — and from this chapter — you can take your test results one by one.

In this chapter, you will learn about the tests doctors use to track your health. You'll learn how to make sense of test results.



Lipid (ˌli-pəd)

Lipids are types of fats, like cholesterol and triglycerides, normally found in your blood. A lipid panel test (or lipid profile) measures the fats in your blood.

Learning to read a lipid profile report

Your blood normally has some fats flowing through it. A test called a lipid profile (or lipid panel) measures those fats. A typical lipid panel measures two main types of blood fat: cholesterol and triglycerides. Need a quick refresher on blood fats? Take a look:

Cholesterol

Cholesterol is one of the two major types of fat normally found in the bloodstream. It helps the body make cells, hormones and vitamins. It also plays a big part in normal growth and development. It comes in two types:

- LDL cholesterol (or LDL-C for short): LDL-C is sometimes called "bad" cholesterol. It's not always bad, though. Some is needed for good health. Too much LDL-C can clog blood vessels as you age. Rather than thinking about it as bad, it's more helpful to think about the level of LDL-C being healthy or unhealthy.
- HDL cholesterol (also called HDL-C): This is known as "good" cholesterol because it helps the body get rid of extra LDL-C that could clump up in blood vessels. Higher levels of HDL-C can be a good thing.

Triglycerides

Triglycerides are another type of fat normally found in your blood. When you eat, your body uses triglycerides as a source of fuel for all your many activities, such as walking, running and playing. Triglycerides that are not needed right away are stored away in fat cells to be used later. Like it needs cholesterol, your body needs some triglycerides to work properly. High levels, though, can spell trouble. If you eat a lot of foods high in fats and carbohydrates, your triglyceride levels might go up. Drinking alcohol and taking some medications can also increase them.

By the numbers: Understanding your lipid profile

It's important to keep your blood fats in a healthy range. Understanding your lipid profile will help you do that. A lipid profile report has a lot of numbers. Let's look at what it means.

Total cholesterol (TC)

Total cholesterol (TC) is just what it sounds like: A measure of all the types of cholesterol (good and bad) in your blood. A high TC can put you at risk for heart problems. When doctors decide to treat high cholesterol with medicine, most prefer to look at LDL-C. Sometimes, they consider both numbers. Looking at TC can help doctors figure out how best to help you stay healthy.

Triglycerides

Healthy triglyceride levels are generally less than 150 mg/dL. High triglycerides are linked to a higher risk of heart disease. Very high levels of triglycerides — for example, over 500 mg/dL — can cause other health problems like pancreatitis (irritation of an organ called the pancreas). It's good to remember, though, that triglyceride levels can go up or down depending on what you've eaten. To get a true idea, it's best to measure triglycerides after fasting (not eating) for at least eight hours. People with high triglyceride levels sometimes need medication to avoid health problems.

HDL cholesterol (HDL-C)

People with high levels of HDL-C usually have a lower risk of blood vessel and heart problems. HDL-C can help balance a slightly high level of LDL-C. If your LDL-C is very high, HDL-C might not help enough. On the other hand, low HDL-C can increase your chance of having heart problems when you grow up. Many factors can lower HDL-C, including smoking, being overweight, family traits and some medications.

LDL cholesterol (LDL-C)

For most kids and teens, a healthy LDL-C level is around 130 mg/dL or less. But if you have other things that put your health at risk — like having diabetes or a family history of heart disease — your doctors might want to set a lower goal for your LDL-C. In that case, your doctors might aim to keep your LDL-C around 100 mg/dL or lower. Your health care team will help you decide what level is best for you. A healthy diet can help you reach that level. If your cholesterol is higher than it should be, your health care team might also recommend you take medication to lower your LDL-C.

Non-HDL cholesterol

This number gives a helpful measure of all the unhealthy cholesterol in your blood. To get non-HDL-C, you subtract HDL-C from the TC. (No need to bring a calculator. Your lipid panel test results will most likely do the math for you.) Tracking non-HDL-C is an excellent way to figure out a person's risk of heart disease. Ideally, non-HDL cholesterol levels should be no higher than 30 mg/dL more than your LDL-C goal. So if your LDL-C goal is 100 mg/dL, then your non-HDL-C goal would be 130 mg/dL or less. Ask your health care team what level is best for you.

Okay, now it's YOUR turn to practice. Let's see what you have learned about a lipid profile report!

If this all sounds like a LOT of numbers…don't worry. It gets easier with practice. Looking at an example might help.

This chart shows our example patient Alex's test results in the **second column**, and how they compare to the "acceptable" range (**the third column**).

Example lipid profile test results

Alex Exampleton

DOB (date of birth): 4/12/2010

Test name	Your result	Lab reference range or acceptable value
Total cholesterol	248	less than 170 mg/dL
Triglycerides	50	less than 150 mg/dL
HDL - C	48	more than 40 mg/dL
LDL - C	190	less than 130 mg/dL
Non - HDL - C	200	less than 145 mg/dL

In this example, the LDL-C is a good place to start. When doctors consider a person's risk of heart disease, it's a very important number. As you can see, it's 190 mg/dL — much higher than the goal of 130 mg/dL or less. In this case, Alex Exampleton's doctor would recommend some changes in Alex's diet and encourage daily exercise. If his LDL-C stays high, the doctor might also recommend medications to lower the level of LDL-C.

Still trying to make sense of it all? Don't be afraid to ask your health care team if you have any questions. They will use their knowledge of your unique health care needs to help you set goals for good health.

Other blood fat tests

The tests you just read about are the most common for keeping track of your blood fats. There are some others that your doctor might recommend:

Apolipoprotein B (Apo B)

All of the unhealthy cholesterol in your bloodstream contains a protein called apolipoprotein B, or Apo B. Apo B measures all the "bad" fat particles that might be floating around in your blood. An Apo B test is another way for your doctor to figure out your risk of heart problems. Doctors can also use Apo B levels to track your progress over time. It's best to keep the level of Apo B at 90 mg/dL or less.

Lipoprotein(a)

This is often called Lp(a) or "L-p-little a." It's considered high if it's around 125 nmol/L (or 50 mg/dL), or higher. High Lp(a) also gives clues about a person's risk of developing heart and blood vessel disease. This test can help your health care team decide the best LDL-C level to set as your goal to help you stay healthy.

Other test results

Besides tests to measure blood fats, your health care team may suggest other tests, too. These tests might measure blood sugar, or tell how well your liver and kidneys are working. Here are some of the tests you might get:

Hemoglobin A1c

This test (often called an A1c) is used to find out if you have diabetes or might be developing it. The test gives an estimate of your average blood sugar level over the past six to eight weeks. Here's what the results mean:

- 5.6% or less: Normal blood sugar levels.
- 5.7%-6.4%: Blood sugar in this range means you are starting to develop diabetes (often referred to as pre-diabetes).
- 6.5% or more: This level usually indicates someone has diabetes.

A1c (ˌā-ˌwən-ˈsē)

A1c is a test that measures blood glucose — the amount of sugar in your blood. High A1c is a sign of pre-diabetes or diabetes.

This test is like a "report card" of your blood sugar. It gives an estimate of your average blood sugar over the past 6-8 weeks. When your blood sugar is higher than it should be, your A1c begins to rise as well.

Comprehensive metabolic profile (CMP)

This test checks your blood sugar. It also measures how well your liver and kidneys are working, and several other things. If you take medications, a CMP is a good way to be sure your medications aren't causing harm to your organs. The report usually contains a LOT of results, so your health care team can help you understand which numbers you need to know. Two important numbers to pay attention to are:

- ALT (alanine transaminase)/AST (aspartate aminotransferase): These tests go by a lot of names: ALT/AST, liver function tests, liver enzymes or transaminases. Whatever you call them, these tests help show if your liver is working properly. (The liver is an organ that keeps chemicals in your blood in a healthy balance.)
- BUN (blood urea nitrogen)/creatinine: These are kidney tests. (Most people have two kidneys, which remove waste from the blood and make urine). These two tests tell your health care team if there are any concerns about how your kidneys are working. If you don't drink enough liquids, your BUN can sometimes get a little high. But that's not a problem as long as your creatinine level is in the healthy range. If you drink more water, your BUN number usually returns to normal.

Urinalysis

Gross alert! You might be asked to pee in a cup. Why does your doctor need your pee? Urine can hold clues about how well your body is working. For example, sugar or protein in a sample of urine can be a sign of health problems. (And if you are treated for those problems, a urine sample can show whether the treatment is working.)

You've read about a LOT of tests. It can be hard to keep track of it all. But you don't have to memorize anything. Feel free to come back to this info any time you have questions about your medical test results. Don't be afraid to ask your health care team questions. They're happy to help explain test results and help you figure out next steps.

Quiz time!

1. **True or false: Cholesterol and triglycerides are always bad for you.**

   ○ True

   ○ False

2. **Which of the following is an example of a healthy level of LDL-C?**

   a. 70 mg/dL

   b. 150 mg/dL

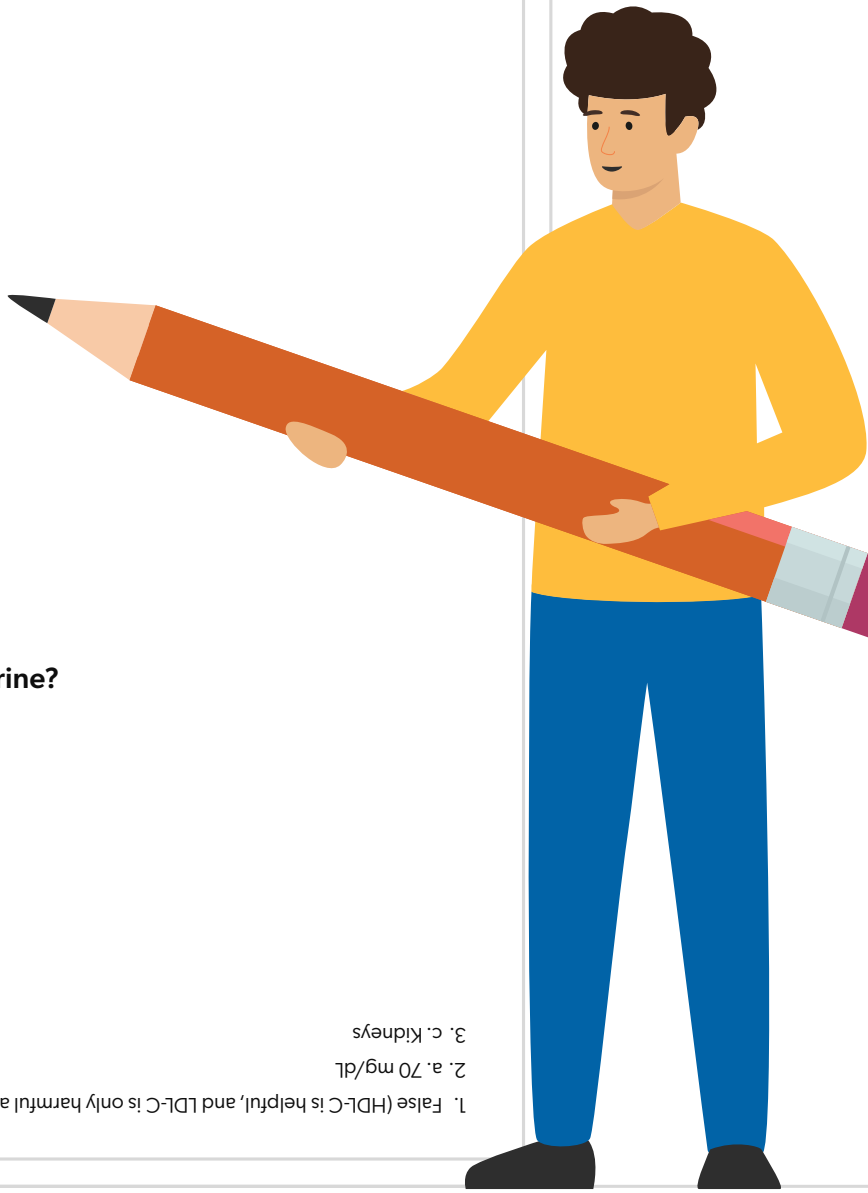
   c. 220 mg/dL

3. **Which organ removes waste and makes urine?**

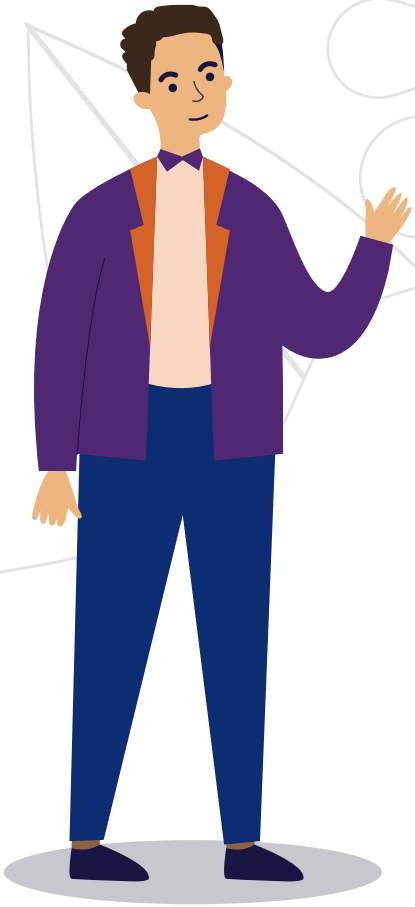
   a. Pancreas

   b. Liver

   c. Kidneys



1. False (HDL-C is helpful, and LDL-C is only harmful at high levels.)
2. a. 70 mg/dL
3. c. Kidneys



Did you know?

Having high levels of cholesterol isn't healthy, but it's common. Tens of millions of adults in the United States have high cholesterol. And about seven in every 100 people aged 6 to 19 have high total cholesterol. Sometimes, high cholesterol is caused by the foods you eat. For many people, high cholesterol runs in the family — even in those who exercise and eat a healthy diet. If you have genes that cause high cholesterol, you might need medicine to control it.

Dig deeper

What should you do when you get results from your blood tests? Take it step by step.

Step #1

With the help of your health care team, decide which results are the most important for you. Review the ones that are most important first. Once those make sense, you can talk about other tests that may be helpful.

Step #2

For each test, look at your number. Then compare it to the acceptable value — also called the reference range. The "acceptable" or reference range is the level present in most children who are healthy.

Step #3

Ask your health care team what your goal is for each test they consider most important. Keep in mind that your goal may be lower than the reference range or acceptable value.

Step #4

If your test result is higher than your goal, talk with your health care team about what you can do to improve it.

Parents' corner

Making sense of medical tests can be challenging. If your child's results aren't in the acceptable range, it can be scary. However, medical tests are an important tool to help people stay healthy. Encourage your child to ask questions about any tests that your doctor recommends. Often, it's helpful to get tests like blood tests done a few weeks before a clinic appointment. That way they won't be as nervous during the appointment. At the visit, you and your child can ask the health care team questions to help you understand the results — and help you make decisions about your child's care.

Many children get worried and might not want to cooperate with blood tests. Do your best to help your child stay calm. You can also help your children understand the importance of regular checkups and blood tests. And be patient. As children mature, many become interested in understanding what the test results mean. Ask your child's health care team what resources are available to help your child be more comfortable with testing.

Helpful tip: Keep a record of your child's blood test numbers, the dates they were taken, any medicines your child was using at the time and any recommendations from your child's health care team.

What can you do?

1. Talk with the health care team about getting your child's test completed before your scheduled clinic visit. Share that information with your child when you feel it is most appropriate.
2. Tell your child's health care team if your child usually gets upset or anxious about tests, especially blood tests. Ask for advice about ways to make it less stressful.
3. Depending upon the age and maturity of your child, explore their understanding of the tests. Discuss why these tests may be helpful.
4. Review the test results and goals with your child. If your child's test results are higher than their goal, discuss ways to improve.

Chapter 10:

Your health care team:

Partners who care about YOU!

There are a lot of things we need to do to stay healthy. Luckily, you don't have to do it all on your own.

Your health care team wants to help you stay well. Each member of your team has special training and experience in helping kids like you. You might have more than one team! For example, you probably have a pediatrician or primary care doctor who helps take care of your overall health. And if you have high cholesterol, you might also have a lipid team to help you keep your heart and blood vessels healthy as you grow. The members of the lipid team can vary from clinic to clinic. But they're all experts in treating problems with cholesterol and triglycerides (blood fats)..

Let's take a look at who is on your team and what they do. As you meet the members of your team, you can write their names here to help you remember.

My team members

My pediatrician or primary care doctor: _____

A pediatrician or primary care doctor helps you manage your overall health. He or she will help you understand your health risks, recommend tests and make a plan to keep you healthy.

My lipid specialist: _____

A lipid specialist is an expert in helping patients manage cholesterol and triglycerides levels that are too high or too low.

My nurse practitioner or physician assistant: _____

Both are highly trained healthcare professionals who work alongside doctors to provide medical care for children.

My medical assistant: _____

Medical assistants are often the first people you meet at your appointment. They measure your height, weight and blood pressure, ask about your medications and show you to the exam room.

My dietitian: _____

Dietitians are experts on nutrition. They will teach you how to choose healthy foods and supplements. They also can teach you how keep your weight in a healthy zone.

My research associate: _____

Some doctors' offices have a research associate to inform you about opportunities to participate in scientific studies. These studies can help improve your care (and the care of other kids like you).

My social worker: _____

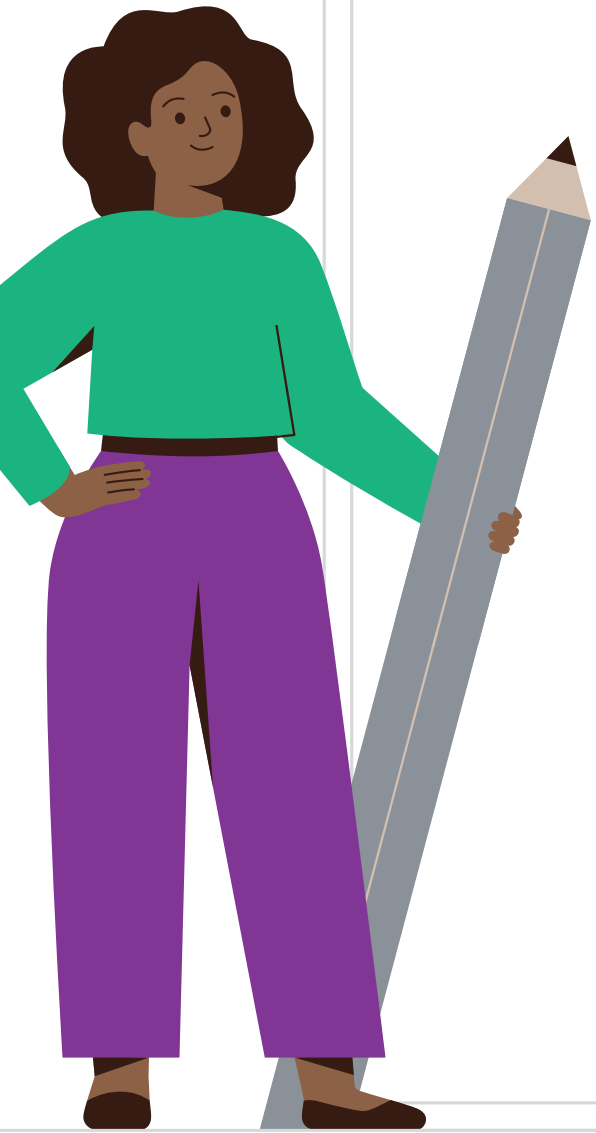
A social worker's job is making sure you have all the resources and services you need. They can help you get the right medications or arrange transportation to your health care visits. They can also connect you with helpful resources in your community.

My child life specialist: _____

Child life specialists are there to make your health care visits less scary. They'll make sure you have everything you need to feel comfortable and safe.

You might have other types of specialists, too, depending on your health care needs. Take a moment to get to know the members of your team. If you have any questions or worries, feel free to ask your team. They're here to help!

Quiz time!



1. What's the best source of information about healthy eating?
   a. Dietitian
   b. Athletic coach
   c. Social media

2. Whom should you talk to if you have questions about your medications?
   a. Dietitian
   b. Medical assistant
   c. Nurse

3. Whom should your family talk to if you have trouble getting transportation to your doctors' appointments?
   a. Child life specialist
   b. School counselor
   c. A social worker

1. a. Dietitian
2. c. Nurse
3. c. A social worker

Dig deeper

Sometimes you might need to contact your doctors office between appointments. You might need to refill your medicine or ask about a new symptom. At your next appointment, ask for the following information. When you need to get in touch, you'll have it handy. Many clinics offer a "patient portal" (it's like a confidential text message) so you can ask questions, share concerns or request medication refills.

1. My doctor's name: _____

2. Doctor's office address: _____

3. Doctor's office number: _____

4. The best way for me to request medications or find answers to urgent questions is:

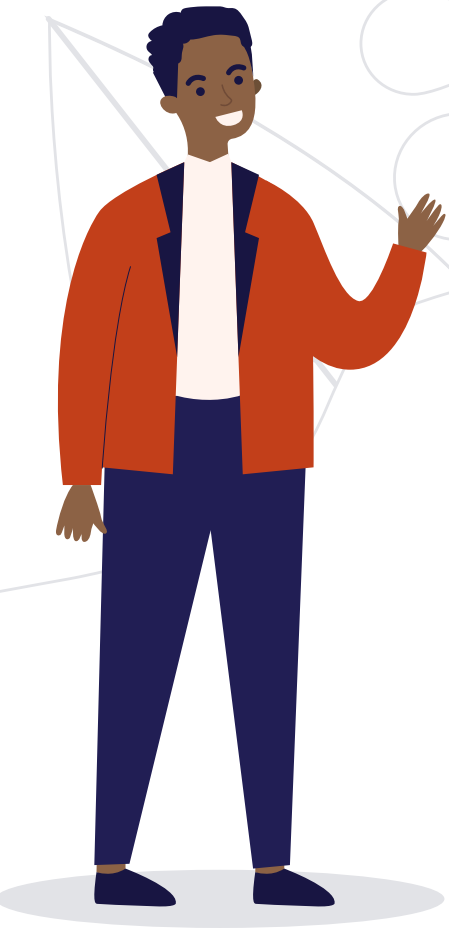
_____

5. If I have an emergency, I should: _____

6. Portal address: _____

Parents' corner

Life is about relationships — with our families, friends and those we come in contact with. By its very nature, health care is personal. The members of your child's health care team have a special interest in your child and your family. They want to get to know you. In return, you should make an effort to get to know them. This helps build trust, which is critically important in helping make important decisions about the health of your child.



Did you know?

There are doctors who specialize in every part of the body, from head (neurologists) to toe (podiatrists)! Your health care team might suggest you see another type of doctor if you have any special concerns. Here are just a few of the many specialists you might meet.

- Cardiologists care for most problems that involve the heart and blood vessels.
- Dermatologists treat problems of the skin and hair.
- Endocrinologists treat problems with hormones (such as diabetes and growth problems).
- Gastroenterologists treat problems of the digestive system.
- Nephrologists care for the kidneys.
- Ophthalmologists care for the eyes.
- Psychiatrists and psychologists treat mental health problems like depression and anxiety.

Ask your health care team if you feel one or more of these specialists might be helpful.

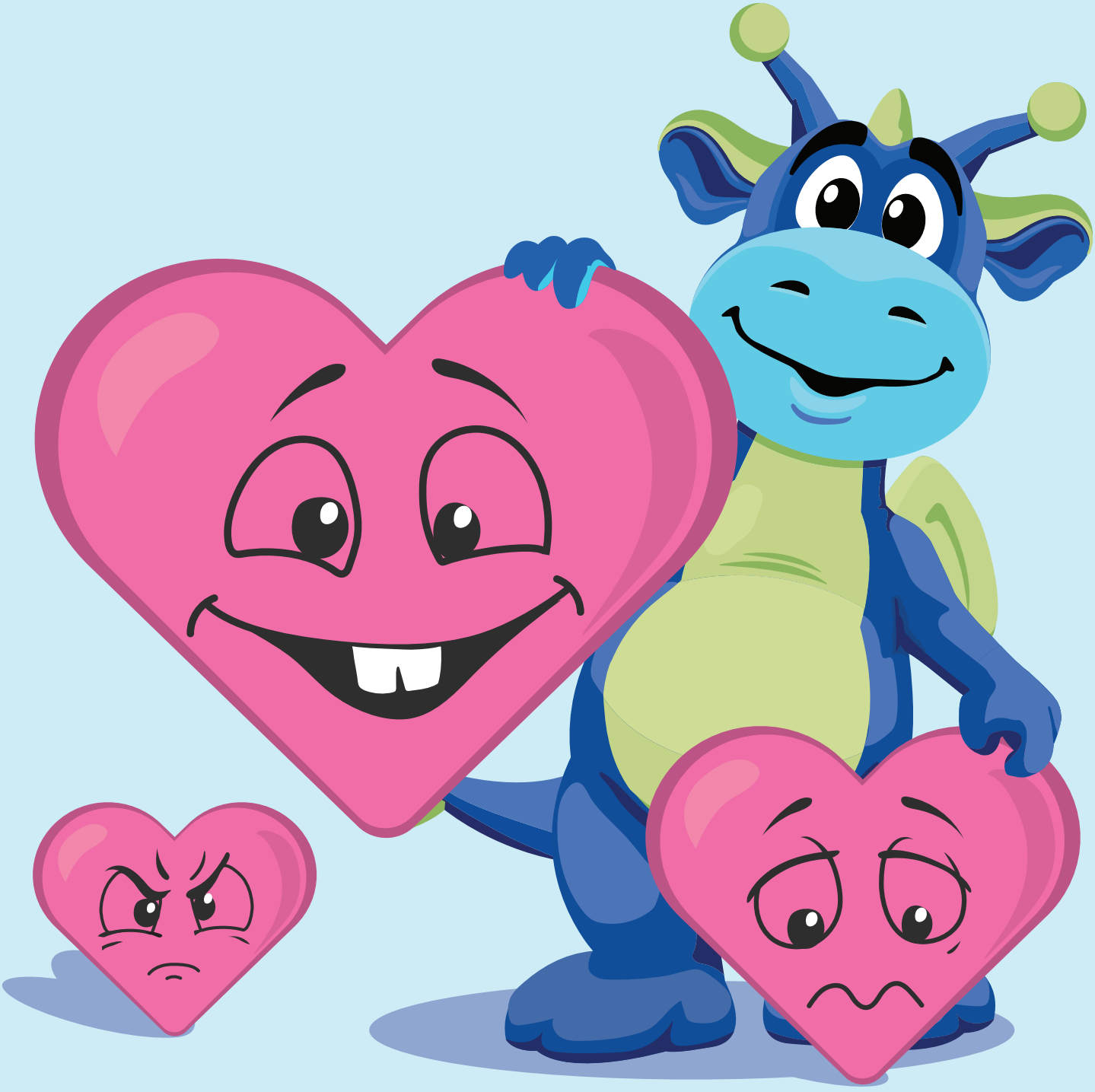
What can you do?

1. Encourage your child to share their likes and dislikes, activities and interests with their health care team.
2. Suggest your child take hand-drawn pictures and notes to your health care visits and share them with the team.
3. If your child has recently received an award or accomplished something noteworthy, share your good news with your health care team! And if you have a brief video of a recent music, dance or theater performance, offer to share it with your providers. They love to share in those successes. (If your child is shy or modest, ask first if they would be comfortable having you share this kind of thing during your visit. It's important to find a balance between celebrating your child and respecting their wishes.)
4. Encourage your child to ask their doctor, nurse or other members of the health care team if they have a hobby, favorite movie or anything else they may be curious about. After all, this type of exchange is what building relationships is all about!
5. Above all, start teaching your child the importance of developing healthy habits at an early age.

Chapter 11:

All the feels:

Managing your emotions



Happy. Sad. Angry. Worried. Our feelings are a big part of being human. You might get grumpy when you're tired or have a lot of homework. You're excited when it's your birthday. You're proud when you ace your science test or sing in a choir concert. Most people experience a big range of emotions — sometimes all in one day!

On top of all those everyday emotions, kids with medical conditions can feel an extra set of emotions. You might feel angry or frustrated that you have to take medicine every day. Maybe you're worried about what your friends would think if they knew you have diabetes or high cholesterol.

Those feelings exist inside your brain. But they can affect you from head to toe. Your emotions affect how you feel about yourself. They determine how you act and the choices you make. And those choices can affect how your friends and family treat you.

In other words, emotions can be complex. You can't always control them, but you can learn how to manage them. Some feelings are easy enough to deal with. If you're grumpy because you're hungry or tired, you'll probably feel better after a healthy snack or a good night's sleep. Not all emotions are so easy to fix or ignore. But with practice, you can take control of the feelings that make you feel uncomfortable and make more room for the ones that make you feel better about yourself and your circumstances.

Dealing with feelings

Think about how you've solved problems in the past. If you get lost, you ask for directions. If you don't understand a math problem, you ask your teacher for help. If you can't find your backpack, you might retrace your steps to figure out where you left it.

These solutions all have two things in common: First, you recognize that you have a problem. Second, you make a plan to solve it. Managing emotions is similar: You have to figure out what you're really feeling. Then you can find ways to deal with it. In other words, you have to name it to tame it!

If this sounds complicated or tricky, don't worry. These steps will help you figure out how to deal with your feelings.

Step #1: Name that emotion

There's a lot more to your emotions than feeling good and bad. Think of a time you felt a strong emotion. Were you sad? Worried? Angry? Afraid? Learning to name your emotions takes practice. But once you understand what you're really feeling, then you can figure out what to do. When you pay attention to your feelings, you might notice that you feel your emotions in different parts of your body. Feeling nervous may make your head hurt or your stomach flutter. Anger might feel like tightness in your chest. You might notice sadness makes you tired. Noticing those physical feelings can help you name your emotions.

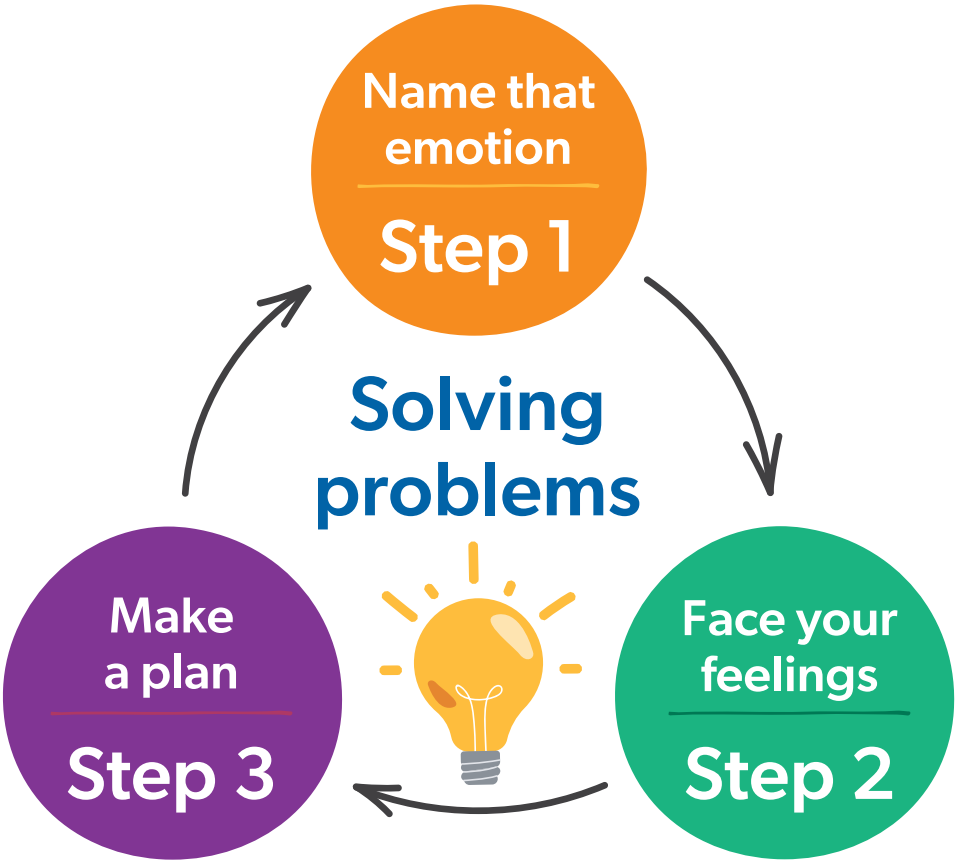
Step #2: Face your feelings

When you're feeling something that makes you uncomfortable, you might be tempted to ignore it. That's a really common habit! However, pretending your feelings aren't real won't make them disappear. (And even if you think you're hiding your feelings, your friends and family might still notice you're upset.) Be honest with yourself — and your loved ones — about how you feel.

Step #3: Make a plan

So you're feeling sad or angry or jealous. Now that you know, you can come up with a plan to deal with it. There are lots of different ways to manage your emotions.
Here are a few that might help when you're experiencing hard emotions:

- Take some deep breaths
- Listen to your favorite music
- Watch a funny movie
- Read a favorite book
- Write in your journal
- Play with a pet
- Go for a walk or bike ride
- Make crafts or create artwork
- Talk to your friends



It might take a few tries to find what works for you, but keep trying. Here are a few more tips that can help make it easier as you learn to manage your feelings:

Go easy on yourself

It can be easy to blame yourself and give up when things aren't going your way. Try to give yourself a break. Imagine what you'd tell a friend who was going through a hard time or feeling the same way you are. Now try to give yourself that same kindness. All kids go through tough times. Remember that you're not alone.

Practice makes progress

It would be nice if you could just decide to be happy. Unfortunately, feelings don't work that way. But with practice, you can start to find ways to shift your feelings to a more positive place. Over time, it will be easier to name your feelings and figure out how to manage them.

Ask for help

People need each other. When you're feeling down, it can help to talk to a friend or trusted adult about what you're feeling. But sometimes, you might need extra help. If you're having trouble managing your emotions, share your feelings with someone on your health care team, like your doctor, nurse or dietitian. They can give you tools to help and might suggest you talk to a counselor or therapist. A counselor or therapist has special training to help you understand your emotions and find new ways to manage them.

Anxiety and depression

Everyone feels sad or worried sometimes. If those feelings go on for too long, there might be something else going on.

Depression is a kind of deep sadness. It can happen to anyone, at any age. Kids who are depressed often feel deeply sad and even hopeless. They might sleep more than usual, or not as much. They can have a hard time paying attention. Often, they stop doing the things that used to be fun. Depression can be treated, though. So don't ignore it. If you think you have signs of depression, talk to someone on your health care team, or another trusted adult. Treatment can help you feel better.

Anxiety is another common problem. Being worried or nervous sometimes is normal. But kids with anxiety feel worried a lot of the time. They might be afraid of specific things, like dogs or going to the doctor. They might be nervous around other people, such as at school. They might just have a feeling that something bad is going to happen. Like depression, anxiety can be treated. If you think you might have anxiety, ask an adult you trust to help.

Depression (di-ˈpre-shən)

Depression is common, and it affects the way you feel, think and act. Kids with depression feel sad, hopeless or irritable a lot of the time.

Quiz time!

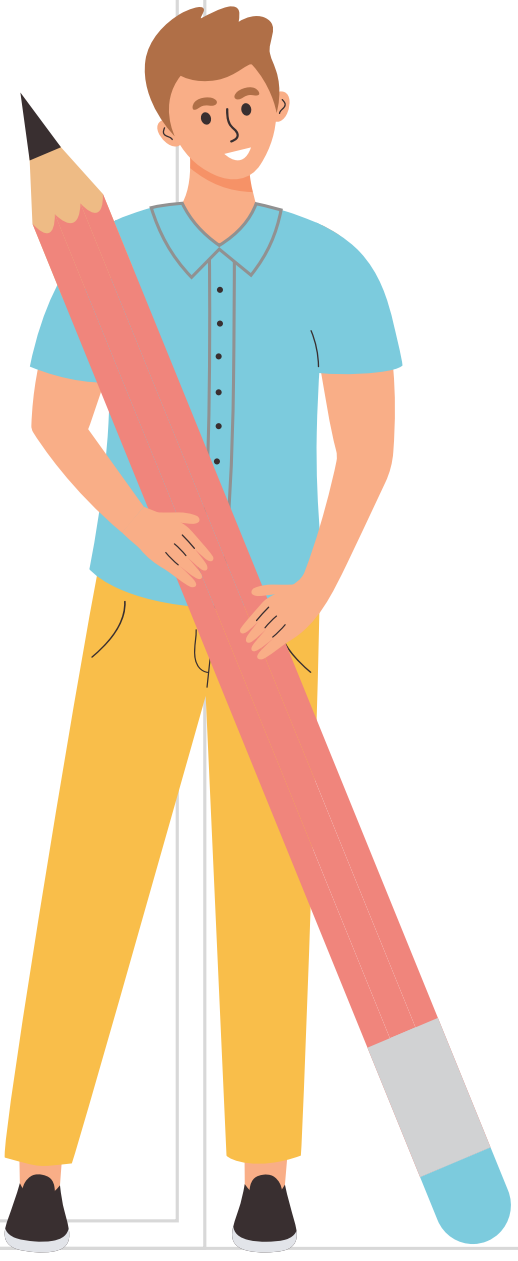
1. Sadness, happiness, anger and fear are examples of _____ (or feelings).

2. True or false: Sometimes you can feel emotions in your body (like in your head or your stomach).

   ○ True

   ○ False

3. _____ is a condition that causes feelings of sadness and hopelessness.



1. Emotions
2. True
3. Depression

Dig deeper

When you're feeling down, it can be hard to figure out how to fix it. It's a lot easier if you have a plan in place. It's also helpful to notice when you're feeling good!

Next time you're feeling happy or excited, think about why you feel that way. Grab your journal and write down how you feel and what's going on around you. Does spending time with your friends make you feel silly? Do you get excited when you have fun plans to look forward to? Do you feel calm when you pet your cat?

When you have feelings that make you uncomfortable, grab your journal again. Write down the yucky feelings you have, like sadness, anger and worry. Now write down at least three things you can do when you're feeling each of those emotions. These ideas will get you started.

When you're sad:

1. Watch a funny movie

2. _____

3. _____

When you're angry:

1. Pet your cat or hug your dog

2. _____

3. _____

When you're worried:

1. Take some deep belly breaths

2. _____

3. _____

Parents' corner

As a parent, you are generally tuned in to your child's emotions. Whether they're happy, sad, angry or afraid, you can probably tell something is going on. But it's not always clear why your child is experiencing a particular emotion. Figuring out what's bothering your kids can be challenging. But there's good reason to try. Your child's emotional health is just as important as his or her physical health. In fact, the two are closely connected.

Unfortunately, children tease each other about all sorts of things, including how they look or whether they are overweight. That can make kids feel angry, sad or ashamed. Kids who have a medical condition (like high cholesterol or diabetes) might be embarrassed about being different from other kids. Even without teasing, a health problem might make them anxious. These can all be tough emotions for kids to manage.

Children deal with their emotions in different ways. A child's stress or sadness often shows up as physical problems, like headaches or stomach pains. They might have trouble sleeping or have little energy during the day.

Kids with anxiety and depression may not be able to tell you how they're feeling. They might show signs like moodiness, irritability or withdrawing from friends and activities.

It's important to be on the lookout for clues that they are having a tough time. Children usually need some help to deal with depression and anxiety. If you have any concerns, talk to a member of your child's health care team. With treatment, they can live happier, healthier lives.

What can you do?

1. **Observe:** Pay attention to your child's emotions. They might not tell you they feel sad or anxious. Pay attention to signs, such as changes in their sleeping and eating patterns, unexplained aches and pains, grumpiness and lack of energy or effort. Is your child losing interest in activities or avoiding friends? A change in your child's school performance can also be a clue that something is going on.
2. **Listen:** Talk with your child about how they are feeling, and why. Let them know you see what they're going through. Be a good listener and avoid being judgmental. This is the time to show your love and support.
3. **Connect the dots:** If your child is complaining of symptoms like headaches or trouble sleeping, think about whether their emotions could be the reason. Kids with anxiety, for example, might complain of an upset stomach on school days, but not on weekends or holidays.
4. **Get help:** If your child's symptoms appear severe or last for weeks, set up an appointment with your health care team. Your pediatrician or primary care doctor can do a physical exam to see if there are medical reasons for the symptoms. If not, he or she may recommend a visit with a child therapist or counselor. Therapists can help kids learn to manage their emotions and cope with stress.

Chapter 12:

Medications:

Take only as directed

It's always a good idea to make healthy food choices and get plenty of exercise. Those habits can do a lot to prevent heart disease and other health problems. But if things like high cholesterol run in your family, a healthy lifestyle might not be enough.

If you have those risk factors, your doctor might recommend taking medication to give you the best chance of staying healthy as you grow up.

In this chapter, you'll read about the types of medications that might be useful and how long you'll need to take them. You'll also get some tips to help you take your medications correctly.

What kind of medications can help?

We're living in a great time for health care. Scientists have created all sorts of medications to treat — and even prevent — health problems. For example, some medications help keep blood sugar levels in check. Others lower high cholesterol levels or blood pressure. Your health care team will help you decide which medications might be best for your needs, and if so, how long you should take them.

Before trying medicine, your health care team will give you a checkup to make sure you don't have any other medical problems. They will also suggest you try making changes to your diet and exercise habits. If those changes aren't enough, though, they may prescribe medicine to give you a boost.

Most medications for high cholesterol, high blood pressure and high blood sugar need a doctor's prescription. Sometimes, though, your doctors might recommend dietary supplements you can get at the drugstore or super market without a doctor's prescription. They can include things like vitamins and herbs.

Some supplements can be helpful. But many of them haven't been tested in kids or could interact with other medications you made be taking. You should always check with your health care team before taking any dietary supplements.

Dietary supplement (dī-ə-ˌter-ē sə-plə-mənt)

These are health products sold without a doctor's prescription, such as vitamins, herbs and fish oils. Kids who eat a healthy, balanced diet generally do not need to take supplements. You should always check with your health care team before taking a dietary supplement.

How long do you have to take this stuff?

Sometimes you take a medication only until your condition gets better. If you have an ear infection, for example, your doctor might prescribe an antibiotic that you take for a week or so.

Other medications need to be taken for a long time — sometimes for the rest of your life. If you have very high cholesterol, for example, you might not be able to control it just by eating healthy food. You may have to keep taking cholesterol medication to keep it in check.

As you get older, your doctors might change the type of medications you take. As you get bigger, you might need a higher dose, or amount, of medication. It might be annoying to take medication every day — and to change up your medication once you finally get used to the routine. But your health care team makes these recommendations to help you stay healthy. Your doctors will be able to answer any questions you have about what medications to take, and why you need them.

Side effects (sīd i-ˈfekts)

Side effects are unwanted things you experience when taking a medication or some supplements, like an upset stomach or a rash. Luckily, serious side effects are rare in children who take medications recommended by their doctor. Milder side effects may occur more often, but usually go away over time.

Are medications safe for kids?

Most medications your doctors recommend are safe for children. Still, all medications come with a chance of side effects. These include things you might feel after taking your medications, like an upset stomach or headache. Or they might be things you see, like a rash on your skin. Sometimes, you don't even notice the side effects — but your doctor can. Doctors might notice changes in your blood tests, for example.

Side effects can be annoying, unpleasant and sometime scary. Luckily, many side effects go away if you keep taking the medication for a while. It is important for you to tell your health care team if you notice any changes after taking a medication — especially if you feel bad. They might be able to adjust your medications to control any annoying effects. (If you do have severe side effects, such as trouble breathing, you should go to the nearest emergency room.)

How to take your medication

When you start a new medication, ask your doctors what you should expect. They can explain possible side effects you might have, and how to deal with them. Your health care team will also explain how and when you should take your medication. Some medicines need to be taken with food. Some should be taken in the morning and others before bed. Also ask if you can take your new medication with your current medications. By following the instructions, you'll be doing your best to keep your body healthy and lower the risk of side effects.

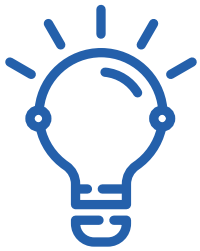
Medicine is helpful, but only if it's taken properly. Make sure you don't take more or less than you should. If you are responsible for taking your own medications, be sure you have a way to remember when to take them. Always place your medication in a safe place, so that your younger siblings or pets don't swallow your medication by mistake.

Make sure you tell a parent or responsible adult when your supply of medication is getting low so you can get more from the pharmacy. Don't wait until you've run out!

Where can you find more information about your medication?

You might be tempted to look up information about your medication on the internet. You should be aware, however, that you can't trust everything you read online. A lot of the medical info on the internet is misleading or just plain wrong — and may even be harmful.

The same goes for friends and family members who share what they've heard about a medication. They might mean well, but sometimes people have heard things about medicines that just aren't true. It's always best to ask your doctor, nurse or pharmacist if you have any questions or worries. They can point you to trustworthy sources of information online. Professional doctors' groups like the American Academy of Pediatrics, the American Heart Association and the National Lipid Association are good places to get the facts.



Good advice

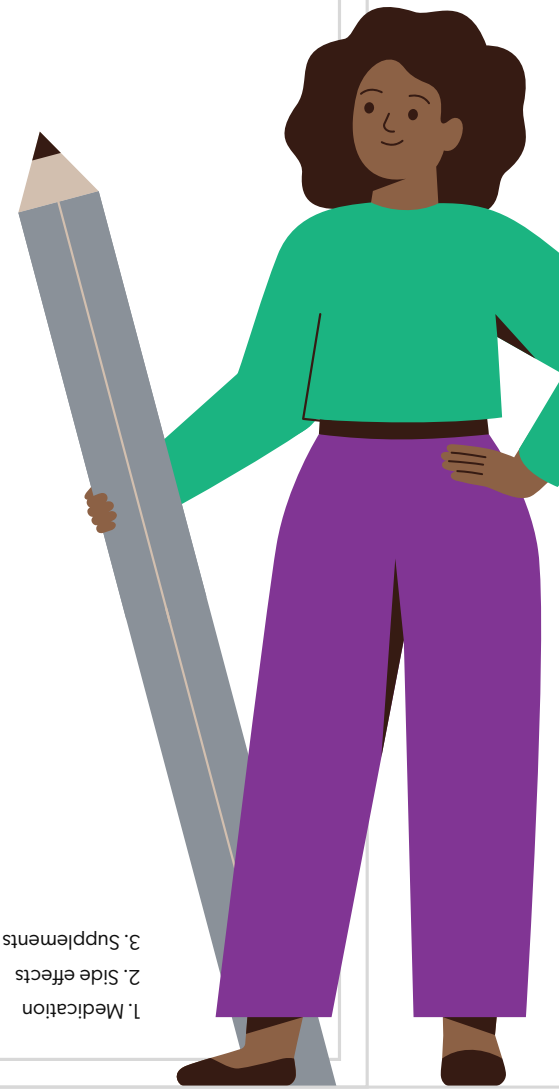
- Tell your health care team if you are taking any medicines. That includes dietary supplements like vitamins and herbs.
- Talk to your doctor before taking any supplements and vitamins.
- Follow the instructions when you take your medicine. If you have any questions, ask your doctor or nurse.
- Don't take other medicines — even over-the-counter pain medicine or cough medicine — without checking if it's safe to take with your prescriptions. A doctor or pharmacist can tell you what's okay.
- Don't rely on everything you read on the internet or hear from a friend.

Quiz time!

1. A healthy lifestyle may not be enough to keep you healthy. _____ may be needed for children with high cholesterol.

2. Medications can sometimes cause _____ like a rash or headache. Usually, these go away over time.

3. If you eat a healthy diet, you probably don't need dietary _____, like herbs and vitamins. Talk to your doctor before taking them.



1. Medication
2. Side effects
3. Supplements

Dig deeper

If you're starting a new medication, you might be a little worried about what to expect. Asking questions will help calm your nerves! Grab a notebook and ask your health care team to answer these questions:

1. How will this medication help me?
2. When should I take it? (For example, do you take it in the morning? At bedtime?)
3. How should I take it? (Do you take it with meals? With a big glass of water?)
4. If you have trouble swallowing pills, ask if the medication comes in a liquid.
5. What side effects could I have?
6. What should I do if I have side effects?

Your medicine will go down a lot easier when you're armed with the facts.

Parents' corner

As a parent, it's natural for you to be worried about giving your child medicine. But medications can be very helpful in keeping your child healthy.

Your child's doctor may prescribe a generic version of a medication. If you have questions, it's okay to ask how the generic compares to the name brand. You can also check with your insurance company to see which option is covered.

If your child is at risk of heart disease, it's important that they adopt a heart-healthy lifestyle and maintain it into adulthood. But a heart-healthy diet and getting plenty of exercise may not be enough. Some children also need medication to control their high blood sugar, high blood pressure or high cholesterol. If your child's doctor recommends these medications, it's often helpful to start when they're young. Medications aren't fun for anyone — kids and adults! But it's worth talking to your child's doctors about the pros and cons. For many children, medicine is an important tool for staying healthy.

What can you do?

- Talk with your child about why they might need medication.
- Make a list of your concerns to share with your child's health care team. Ask them to discuss the pros and the cons of medication. Be sure to include any concerns your child might have.
- Ask your health care team to review possible side effects. What things should you watch out for?
- Be sure you and your child are clear about how the medication should be taken. Work together to follow the directions correctly.
- Tell your child to let you know if he or she has any concerns or notices any side effects. If so, talk about those concerns with your child's health care team.
- Help your child learn to tell the difference between trusted sources (such as the American Academy of Pediatrics, the American Heart Association or the National Lipid Association) and questionable information they might find by surfing the internet.

Chapter 13:

Foods:

Healthy foods for a healthy you

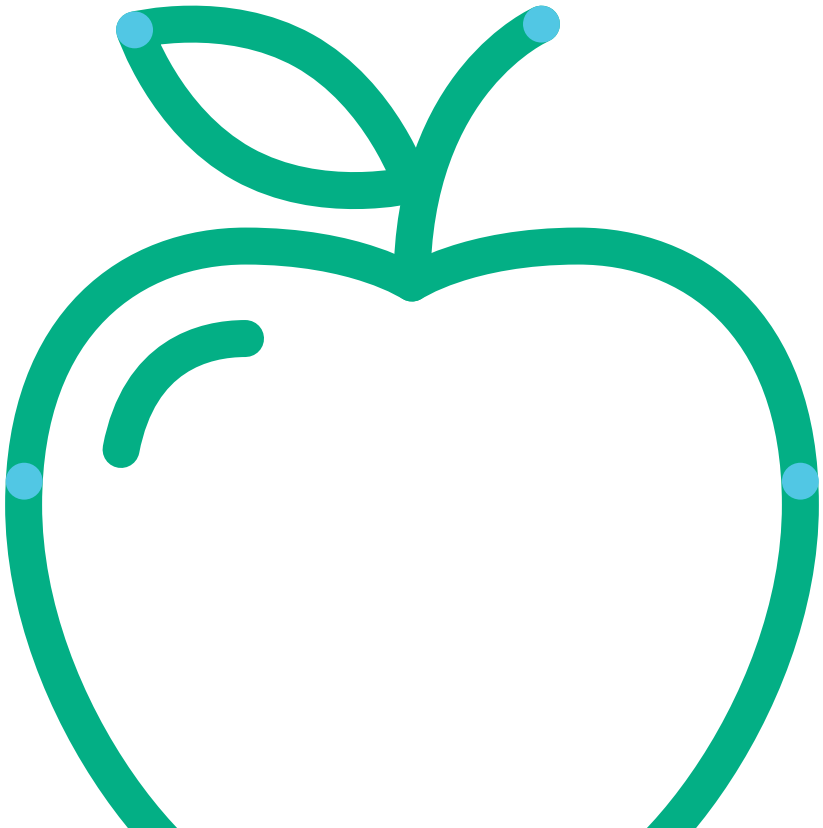
Most of us have at least one thing in common: Our bodies need food!

We all need to eat to give our bodies energy and nutrients. Eating too much or too little can affect your health and cause issues such as heart problems when you become an adult. And it's not just how much you eat. The type of foods you choose is important, too.

Imagine a cookie and an apple. Both taste sweet. That's because they both contain sugar. But the apple likely has a lot less sugar. The apple has fiber, too. Fiber is a substance in plants that has a whole bunch of health benefits. The apple also has vitamins and minerals — things your body needs to grow and function. If you eat the apple, your body will get all those good-for-you benefits. If you eat the cookie? You'll get calories, but you won't get many nutrients.

Of course, foods like cookies can be delicious. Healthy eating is all about finding the right balance. Nutritious foods like fruits and vegetables are always great choices. Less-nutritious foods and drinks (like cookies, chips and soda) should be "once in a while" foods. You should try to have WHOA foods only a couple of times per week, instead of eating them every day. Spoiler Alert: You will learn much more about "GO - SLOW - WHOA" foods in Chapter 14.

Keeping a healthy balance can be tough. In this chapter, you'll learn more about the foods you eat — and how to pick what you put on your plate.



The nutrients you need

Foods and drinks contain the basic building blocks your body needs to grow and function. These building blocks are also called "nutrients." Some nutrients are big and some are small. There are three big nutrients, or "macro" nutrients: carbohydrates, proteins and fats. When you eat foods with those nutrients, your body uses them for energy, to grow and to make your muscles stronger.

Different foods and drinks contain different kinds and amounts of nutrients. Eating a nutritious, balanced diet will help you get all the different nutrients you need to stay healthy.

Let's take a closer look at the macronutrients in the foods you eat. Like the members of a school band or a sports team, each has a special role to play. And it takes a lot of practice to get it right.

Carbohydrates

Carbohydrates — or "carbs" — are broken down into sugar in your body. That includes the sugar that gives foods like fruit and ice cream their sweet taste. However, the white stuff in your sugar bowl is just one type of carbohydrate. Here's the scoop on carbs.

- **Simple carbohydrates:** Sugar is a simple carbohydrate. What makes it simple? It's made of just one or two sugar molecules. (Molecules are the building blocks that make up your food, your body and every other living thing.) Simple sugars are used as energy for your body. But they don't have any other nutrients, like vitamins or minerals. And because they are so simple, your body uses them up quickly. That can make your blood sugar levels rise quickly too.

- **Complex carbohydrates:** Complex carbs are made of lots of simple sugars strung together like beads on a necklace. Because they're bigger and more complicated, they take longer for your body to break down. That means the level of sugar in your blood stays steady for a long time. (That's a good thing.) Complex carbs are found in foods like fruits, vegetables, beans and whole grains. What's a whole grain? Foods like oats, whole wheat and brown rice.

What carbs should you eat?

Carbohydrates are a good source of energy. But some are more helpful for your body than others. Sweet foods like candy, desserts and soda have a lot of simple sugar. Refined grains, like white bread, white rice and noodles have a lot of simple sugars too. These foods and drinks don't give your body many nutrients, so it's a good idea to choose them less often.

Whole grain foods, like whole wheat bread, brown rice and oatmeal are complex carbs, and are more helpful for your body. They contain nutrients like fiber, vitamins and minerals that your body needs to stay healthy.

What about foods with "added sugar"?

Lots of foods naturally have some sugar. Fruits like apples and bananas taste sweet because they contain sugar. Dairy products like milk and yogurt also have sugar.

Added sugar is just what it sounds like: Extra sugar that is added to foods. Added sugar is found in all sorts of things. Sodas, fruit drinks and cookies have a lot of added sugar. Added sugar can also be hiding in foods like fruit-flavored yogurt, breakfast cereal and granola bars. Added sugar adds calories. But it doesn't add any nutrients. Try to avoid foods that contain added sugar whenever you can.

Carbohydrate (kär-bō-ˈhī-ˌdrāt)

Carbohydrates are sugar molecules. Simple carbohydrates, like white sugar and honey, have no vitamins or minerals. Complex carbohydrates, found in foods like fruits, vegetables and whole grains, are healthier choices.

Protein

Proteins are powerful building blocks for your muscles and organs, and they help give your body energy.

Most people think about protein when they eat meat. It's true that meat, poultry, fish and eggs are good sources of protein. But proteins are also found in other foods, like nuts, beans and grains. Soybeans are a good source of protein. So is milk.

Most the protein in our diet comes from either animals (meat, poultry, fish, eggs, and dairy) or plants (fruits, vegetables, grains, nuts and seeds). But some plant sources of protein are incomplete. That means they don't contain all the different types of protein your body needs. If you're a vegetarian, it's a good idea to talk to someone on your health care team, like your doctor or dietitian, to make sure you're getting all the right types of protein.

Just like sugar and fat, too much protein in your diet can cause health problems. Healthy eating is all about balance.

Protein (prō-ˌtēn)

Proteins are a power-packed nutrient for the human body. Protein from the foods you eat is needed for building muscles and help you grow.

Fat

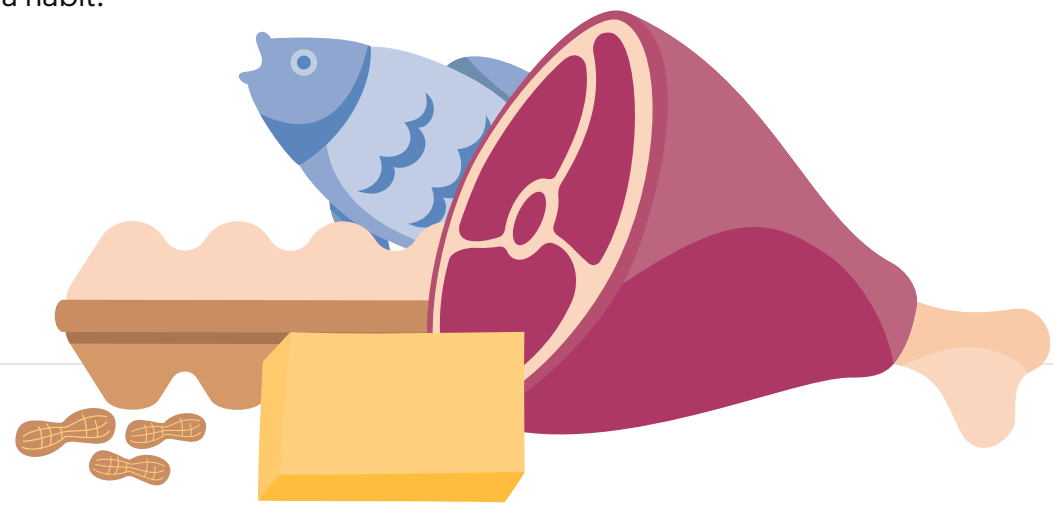
Fat sounds like something you should probably avoid ... right? Well, not exactly. You might be surprised to learn that fat is important in keeping you healthy. In addition to sugar, fat gives you energy to walk, run and do all the things you do each day. Fat also helps your body absorb vitamins.

Most of the fat in your body comes from the foods you eat. So, choosing the right type of fat is important. Some foods, like most fruits and vegetables, have almost no fat. Other foods — like nuts, oil, butter and meats — have lots of fat.

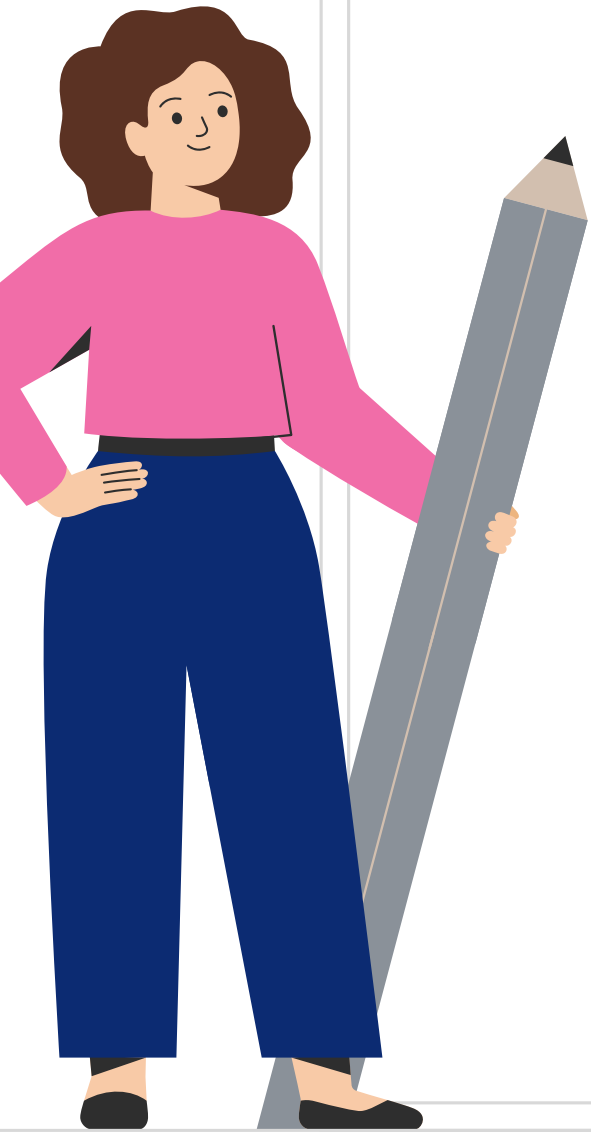
Like carbohydrates, there are many different types of fats. Some kinds of fat are better for your heart than others. Let's take a closer look.

- **Unsaturated fats:** These are the heart-healthy types of fat. They come mostly from plant sources like nuts, seeds, avocados and vegetable oils (like olive oil or canola oil). Unsaturated fats are also found in some fish, like salmon and sardines.
- **Saturated fats:** These fats are found in meat and other animal products, such as butter and cheese. Cakes, cookies and baked goods also have a lot of saturated fat. Eating too much saturated fat can raise levels of "bad" cholesterol. That can increase the risk of heart disease as you grow older. To help your heart stay healthy, you should try not to eat too much saturated fat.
- **Trans fatty acids:** Most trans fats are human made, and they often contribute to health problems as you grow older. They were once common in foods like baked goods and fried foods. Since 2018, the U.S. government banned artificial trans fats in manufactured foods. Yet some products, like fried foods, still contain them. That's one reason you should avoid fried foods whenever you can.

The three macronutrients — Carbs, Protein and Fat are a big part of your diet. But they aren't the only things to pay attention to when selecting something to eat. Choosing the right foods can do a lot to help your heart stay healthy. With practice, healthy eating will become a habit.



Quiz time!



1. Fat, protein and carbohydrates are the three macro _____.

2. Sugar is a:
   a. Protein
   b. Carbohydrate
   c. Fat

3. Which of these foods contains healthy fats?
   a. Fried chicken
   b. Donuts
   c. Walnuts

4. True or false: Trans fats are a healthy type of fat.
   - ○ True
   - ○ False

1. Nutrients
2. b. Carbohydrate
3. c. Walnuts
4. False

Did you know?

Sugar is found in most packaged foods on store shelves. And sometimes it's hiding in plain sight. That's because sugar goes by a lot of different names. With a little practice, you can soon become an expert in spotting the different kinds of sugars listed on food labels. Share what you have learned with your parents, siblings or friends the next time you go grocery shopping or if helping out in the kitchen. Here are just a few names sugar might be hiding on a food's nutrition label:

- Agave
- Sucrose
- Glucose
- Maltose
- Fructose
- Molasses
- Galactose
- Corn syrup
- Evaporated cane syrup
- High-fructose corn syrup

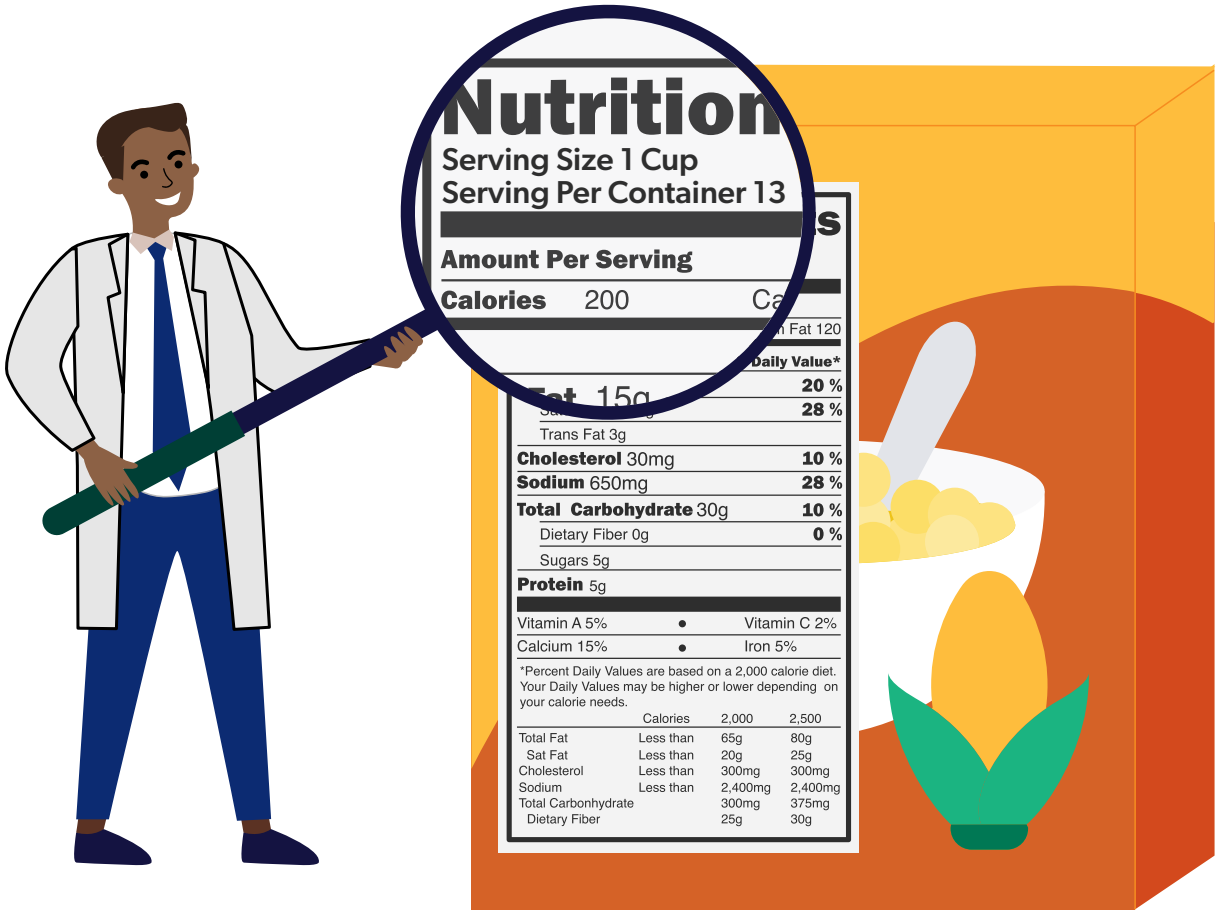
Dig deeper

How do you know how much saturated fat or added sugar is in a food? Nutrition labels! It's important to read the label on your favorite packaged snacks and foods. It looks complicated when you first start, but it's easy once you get the hang of it. It just takes practice.

The label shows the important details, like how many calories or energy are in a food. It also shows the amount of the macronutrients you have just learned about: fats, proteins and carbohydrates. It shows other facts, too, like vitamins, minerals and sodium (salt).

Labels are handy for comparing one food to another. Does one kind of cereal have more added sugar than another? Does one type of milk have more fat than another? The labels can guide you toward healthier choices.

When reading the nutrition label, there's an important trick. Before you look at any other info, check the serving size. The nutrition facts on the label tell you what's in one serving, not one package. If you eat two servings, you have to double all of the numbers on the label. Many food packages contain more than one serving, so pay attention to this number.



Parents' corner

Food is a huge part of our lives. Holidays, parties and other special events often revolve around food. Kids' events and activities usually include snack time. A good portion for our day is spent eating.

We have to eat to live. But what we eat affects our health in important ways. Because eating is such a big part of our lives, it's worth taking time to learn how to make healthy food choices. And the sooner we learn that lesson, the better. Taking time to help your children learn healthy eating is a great investment in their future.

What can you do?

Just as you teach your child how to tie their shoes, you can teach them how to have healthful eating habits. It is important for your child to set up a healthy relationship with food at a young age, and for you to teach your child which foods can help their body. To help your children understand how to make healthy choices, you should do these three things:

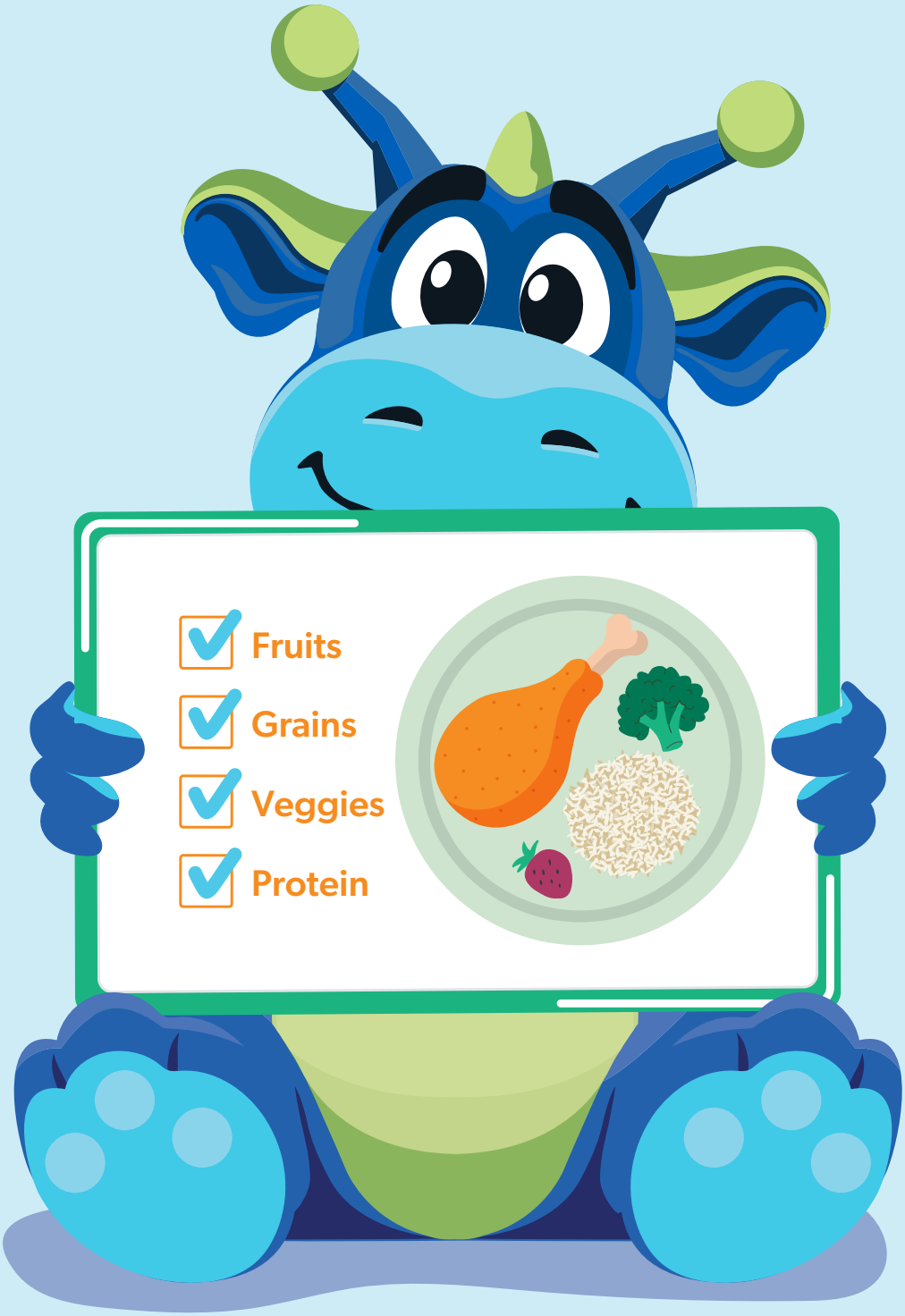
1. **Learn:** Become knowledgeable about proper nutrition. Read to learn about foods and healthy eating habits. If you are a visual learner, there are also many helpful videos about proper eating. Talk to your health care team for more information and helpful resources about good nutrition.
2. **Share:** Serving healthy foods to your family is an important step. But it's also important to teach your family members why you chose those foods. Talk with your children about nutrition, and encourage them to listen to their body's hunger cues. This sets up a healthy relationship with food. Think of fun activities to help your kids explore new foods and learn about nutrition.
3. **Show:** Be a role model. Kids often learn from what their parents do, not what they say. Modeling healthy choices as a parent will help your children learn to make healthy choices themselves.

Soon your entire family will be on the road to healthier living!

Chapter 14:

All about eating:

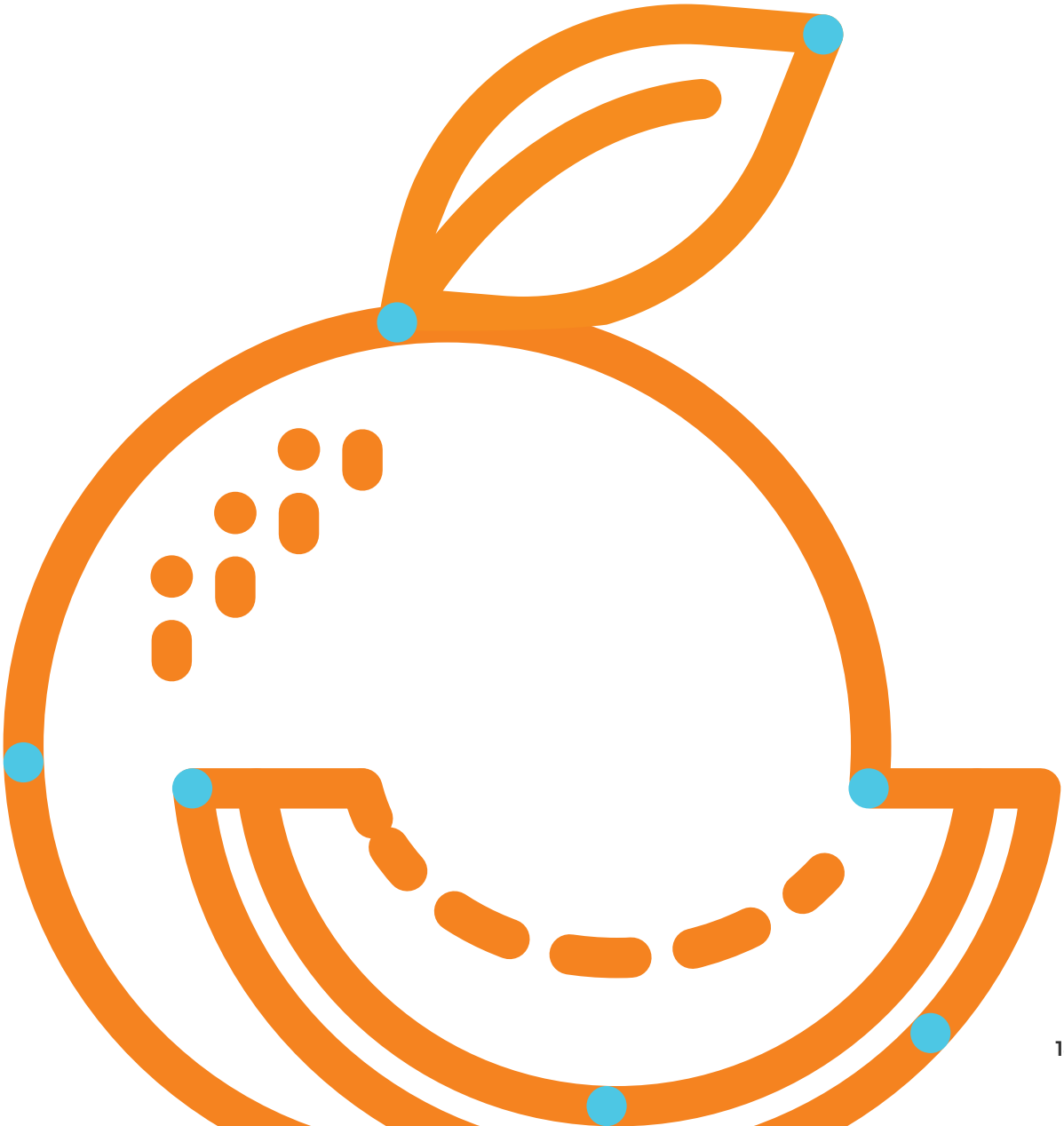
Good habits for good health



Why do we eat? Food gives your body the energy and nutrition it needs to grow, stay healthy and be strong!

But some foods do a better job than others. What does your body need to stay healthy? Which foods give your body the most "good stuff?" Learning healthy eating habits takes knowledge, practice and patience. But it's worth the effort.

Some things you've learned about food and eating habits are probably confusing. No worries! In this section, you will learn about ways of eating that will help your body stay healthy and strong.



The foods you choose

Taste is important, but it's not the only thing you should consider. Your food choices can make a big difference in your health. Take a look at the chart on the opposite page to figure out if you should say GO, SLOW or WHOA.

Some foods are "GO" foods. GO foods are full of healthy nutrients, and most of what you eat should be GO foods.

"SLOW" foods are things you should eat in moderation, that is, we shouldn't overdo it.

"WHOA" foods are foods that don't have many helpful things for your body. You should only enjoy them every once in a while.

There are a lot of healthy options for foods and snacks. The key is to try many different foods to see what you like and what you don't like. And, as always, listen to your body! Eat when you are hungry, and stop when your stomach says it isn't hungry anymore.

Food group	GO (Almost anytime foods)	SLOW (Sometimes foods)	WHOA (Once in a while foods)
	Nutrient-dense ←	Nutrient- and calorie-dense	→ Calorie-dense
Vegetables	Almost all fresh, frozen and canned vegetables without added fat and sauces	All vegetables with added fat and sauces; oven-baked French fries; avocado	Fried potatoes, like French fries or hash browns; other deep-fried vegetables
Fruits	All fresh, frozen, canned in juice	100% fruit juice; fruits canned in light syrup; dried fruits	Fruits canned in heavy syrup
Breads and Cereals	Whole-grain breads, including pita bread; tortillas and whole-grain pasta; brown rice; hot and cold unsweetened whole-grain breakfast cereals	White refined flour bread, rice, and pasta. French toast; taco shells; cornbread; biscuits; granola; waffles and pancakes	Croissants; muffins; doughnuts; sweet rolls; crackers made with trans fats; sweetened breakfast cereals
Milk and Milk Products	Fat-free or 1% low-fat milk; fat-free or low-fat yogurt; part-skim, reduced fat, and fat-free cheese; low-fat or fat-free cottage cheese	2% low-fat milk; processed cheese spread	Whole milk; full-fat American, cheddar, Colby, Swiss, cream cheese; whole-milk yogurt
Meats, Poultry, Fish, Eggs, Beans and Nuts	Trimmed beef and pork; extra lean ground beef; chicken and turkey without skin; tuna canned in water; baked, broiled, steamed, grilled fish and shellfish; beans, split peas, lentils, tofu; egg whites and egg substitutes	Lean ground beef, broiled hamburgers; ham, Canadian bacon; chicken and turkey with skin; low-fat hot dogs; tuna canned in oil; peanut butter; nuts; whole eggs cooked without added fat	Untrimmed beef and pork; regular ground beef; fried hamburgers; ribs; bacon; fried chicken, chicken nuggets; hot dogs, lunch meats, pepperoni, sausage; fried fish and shellfish; whole eggs cooked with fat
Sweets and Snacks*		Ice milk bars; frozen fruit juice bars; low-fat or fat-free frozen yogurt and ice cream; fig bars, ginger snaps, baked chips; low-fat microwave popcorn; pretzels	Cookies and cakes; pies; cheese cake; ice cream; chocolate; candy; chips; buttered microwave popcorn
Fats/Condiments	Vinegar; ketchup; mustard; fat-free creamy salad dressing; fat-free mayonnaise; fat-free sour cream	Vegetable oil, olive oil, and oil-based salad dressing; soft margarine; low-fat creamy salad dressing; low-fat mayonnaise; low-fat sour cream**	Butter, stick margarine; lard; salt pork; gravy; regular creamy salad dressing; mayonnaise; tartar sauce; sour cream; cheese sauce; cream sauce; cream cheese dips
Beverages	Water, fat-free milk, or 1% low-fat milk; diet soda; unsweetened iced tea or diet iced tea and lemonade	2%low-fat milk; 100% fruit juice; sports drinks	Whole milk; regular soda; calorically sweetened iced teas and lemonade; fruit drinks with less than 100% fruit juice

*Though some of the foods in this row are lower in fat and calories, all sweets and snacks need to be limited so as not to exceed one's daily calorie requirements. **Vegetable and olive oils contain no saturated or trans fats and can be consumed daily, but in limited portions, to meet daily calorie needs. (See Sample USDA Food Guide and DASH Eating Plan at the 2,000-calorie level handout.)

Chart adaptation source: https://www.nhlbi.nih.gov/health/educational/wecan/downloads/go-slow-whoa.pdf

What should you eat?

You've probably heard people talk about eating a "balanced diet." What does that even mean? A balanced diet has foods from lots of different food groups (including vegetables and fruits, lean proteins, carbohydrates and dairy products). If you just fill up on bread or only eat a plate full of meat, your body won't get all of the good things it needs to stay healthy. Try to eat meals that have variety: lean meats, whole grains, fruits and vegetables. A balanced diet gives your body the fuel it needs to grow and stay strong.

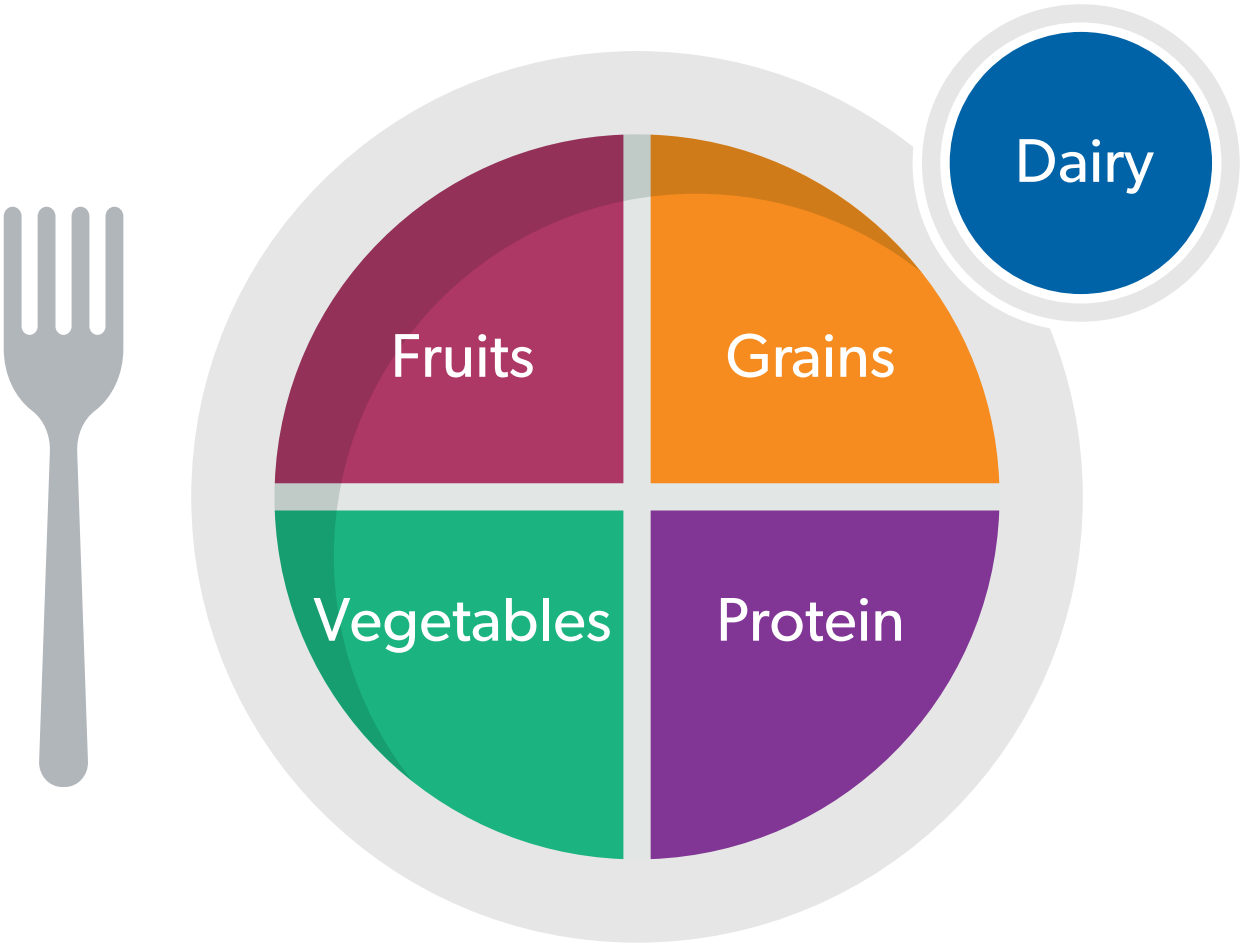
The American Heart Association gives advice about how to eat a heart-healthy diet. For kids and teens, it recommends:

- Eating a variety of foods to get lots of nutrients.
- Choosing as many whole-grain breads and cereals as you can, instead of foods made from white flour or white rice.
- Eating several different fruits and vegetables every day. Each meal should contain at least one fruit or vegetable.
- Choosing healthy sources of protein, such as beans, nuts, fish, and low-fat or nonfat dairy products. If you eat meat, choose lean meat and poultry.

Moderation (mä-də-ˈrā-shən)

Moderation is avoiding extremes. Eating in moderation means enjoying all different kinds of foods and in the right amount for your body.

How much should you eat?



This picture shows a smart way to fill your plate. Try to fill half the plate with vegetables (or a mix of veggies and fruit). The other half of your plate should be split between whole grains (like whole wheat bread or brown rice) and lean protein (like chicken, turkey, nuts or fish). Low-fat dairy products, like fat-free or low-fat milk and cheese, can be part of a healthy diet, too. You should limit foods with added sugars, salt (also known as sodium) and saturated fat (which you read in the last chapter).

Portion size is also important. Try not to pile too much food on your plate. Give yourself time to eat and digest. Learn to listen to your body and stop when you're full. A good way to look at portions is by using your hand and fist! Protein foods should be the size of your palm, not counting your fingers. Starches and carbohydrates should be about the size of your fist.

Water, water everywhere

Protein is the second most abundant substance in your body. But what's number one? Water! Yep, plain old H_2O. Whether you drink it straight out of your kitchen faucet or out of a bottle, you need to drink water every day.

Water is a must to keep your cells working properly. It's so important that it makes up over half of your body weight. That means that if you weigh 120 pounds, over 60 pounds of your weight is water.

Your body needs water to function. But you lose a little bit of water when you go to the bathroom, when you sweat — and even when you breathe. To make up for all the water you lose, you need to drink some every day. Younger kids should drink 4 or 5 glasses of water a day. Tweens and teens should drink 7 or 8. When it's hot out, or you're being active, you need even more water so you don't get dehydrated.

Sugar sweetened beverages like soda or juice might sound tempting. Although they do contain water, they also have a lot of sugar! To stay hydrated, reach for plain water. (If you're in sports or outside a lot, talk to your doctor or dietitian to see if you need to add in a low-sugar sports drink every now and then.)

What about milk? Milk is a great source of protein. It also has vitamins and minerals to help your bones grow. But drinking too much milk can lead to your body getting too many calories during the day. Milk can be part of a healthy diet — in moderation. (Yep, there's that word again. When it comes to healthy eating and drinking, moderation is a word you should remember.)

Bottom line: Save sweet drinks for special occasions, and don't forget to drink plenty of plain water, every day.

Dehydration (dē-ˌhī-ˈdrā-shən))

Dehydration is the loss of too much water from the body. It can affect the way your organs work and make you feel weak and tired.

Fiber is your friend

What do bread, apples, oatmeal and carrots have in common? They all come from plants. Those and other plant-based foods contain stuff called fiber. And fiber is a good thing.

In Chapter 13 you read that fiber is a form of a carbohydrate. It's the part of the plant your body can't break down. When you eat fats, proteins and sugars, your body breaks those things down into smaller parts. Those parts flow into your bloodstream to deliver energy to cells. But fiber doesn't get broken down by your body. Instead, whatever fiber you eat passes through you — and out the other end.

Just because fiber goes right through you doesn't mean it's a waste. In fact, it's a very important part of a healthy diet. For starters, fiber helps you poop regularly. It also helps you feel full after you eat. That's not all! A diet that's high in fiber can help lower cholesterol. It can even lower the risk of health problems like heart disease, type 2 diabetes and some forms of cancer.

Even though fiber is good for you, most kids don't eat enough of it. To help you to get enough, reach for high-fiber foods like fruits, vegetables, whole grains and legumes (things like snap peas and beans).

There are two types of fiber:

Soluble fiber: This type of fiber dissolves in water to form a gel-like material. It lowers cholesterol and helps you stay full after a meal. You can find it in foods like oats, barley, peas, beans, apples, citrus fruits and vegetables.

Insoluble fiber: This type of fiber helps you poop, which keeps your intestines healthy. Whole-wheat flour, wheat bran, nuts and beans are good sources of insoluble fiber. So are many vegetables, like cauliflower, green beans and potatoes.

Fiber supplements and fortified foods

Whenever possible, you should get fiber from the foods you eat. After all, those foods contain vitamins, minerals and other good-for-you nutrients as well. But to be sure you're getting the right amount of fiber, your health care team might suggest you take a fiber supplement. (These are powders or special foods that contain extra fiber.)

Supplements can be helpful if you have certain medical conditions, like constipation or diarrhea. Fiber supplements can also help you lower cholesterol. Always check with your health care team before taking fiber supplements on your own.

Another way to get more fiber is to eat fiber-fortified foods. These are foods that have extra fiber added. You can find fortified cereal, granola bars, yogurt and ice cream. (Take a look at the nutrition label. The added fiber might be called by some names that are unfamiliar to you, such as oat fiber, psyllium, inulin or chicory root.)

Heads up! Some people get gassy when they first start eating foods with a lot of fiber. To avoid a bloated belly, add them to your diet slowly, and drink a lot of water when you eat high-fiber foods.

Quiz time!

1. How often should you eat "WHOA" foods?

   _____

2. What is the most abundant substance in your body?

   _____

3. True or false: You should drink three glasses of water every day.

   ○ True

   ○ False

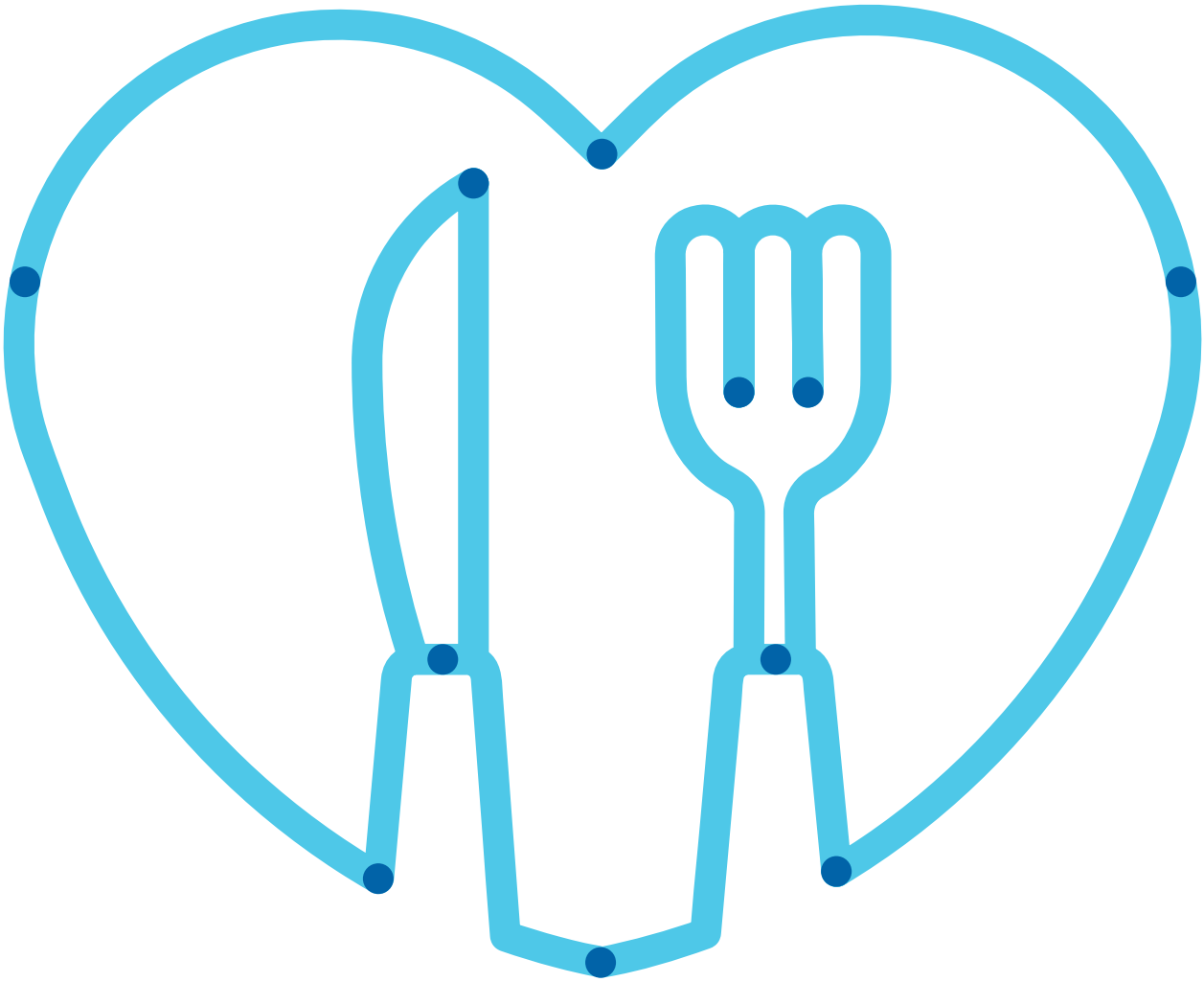
4. Which food is NOT a good source of fiber?

   a. Apples

   b. Beans

   c. Milk

1. WHOA foods should be eaten once in a while.
2. Water
3. False, Depending upon your age, you should drink at least 4-8 glasses a day.
4. c. Milk



Good advice

Here are some more tips to make the most of the foods you eat.

- Whenever possible, eat meals with your family. Use this time to catch up on everyone's day and upcoming family events.
- Avoid eating meals while watching TV or using a gaming device, cell phone or other electronic device. When you're distracted, it's easy to eat too much without even knowing it.
- Drink plenty of water to stay hydrated and avoid drinks that contain a lot of sugar.
- Take small bites and chew your food well before swallowing.
- There's no reason to hurry! Take time to enjoy your meal and listen to your body. It will let you know when it has had enough food.

Dig deeper

Want to start eating healthier? Start by learning to spot GO, SLOW and WHOA foods. Practice the next time your family goes grocery shopping or out to dinner. Can you use your new knowledge to pick out more GO foods in place of WHOA foods? Try to plan a day's worth of meals and snacks using only GO and SLOW foods. Which GO foods are your favorites?

Daily meal planner

Breakfast:

_____

_____

_____

Lunch:

_____

_____

_____

Dinner:

_____

_____

_____

Snacks:

_____

_____

_____

Parents' corner

Have you ever thought about your own eating habits? There's a good chance many of your likes and dislikes started when you were a child. Every day, we make choices about what to eat and drink. Some options are healthier than others. The best way to help your child make smart choices is to make them together, as a family. It is also important for parents to be good role models by eating healthy meals and snacks. Teaching your child at a very young age to make healthy choices is a great investment in their future, and yours as well! If you're unsure about the best diet for your child, ask your health care team whether a registered dietitian is available or if they can refer you to one.

What can you do?

Healthy eating is a skill that takes a lot of practice. It's never too late (or too early) to start. Here are some tips to help your child develop healthy eating habits

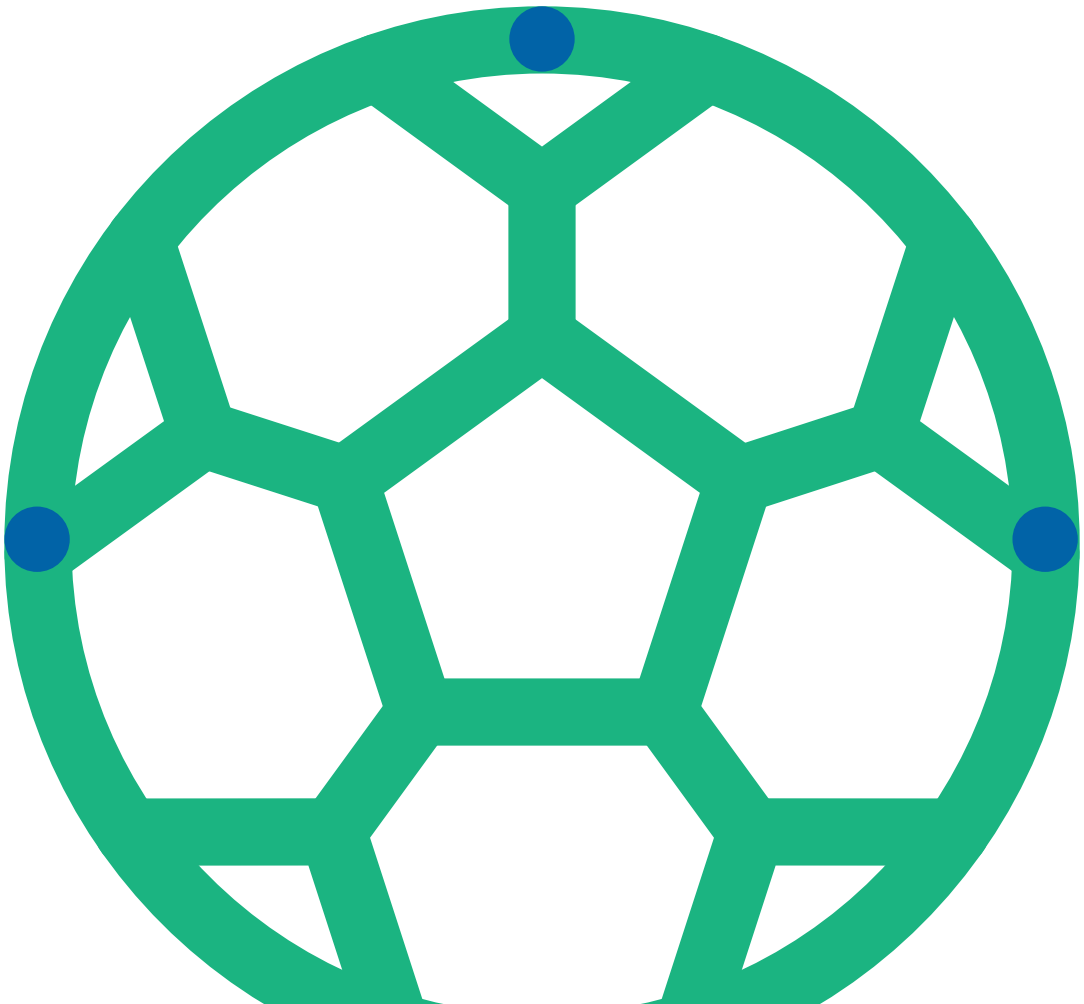
1. Be a good role model! Get your entire family involved in eating healthy foods together.
2. Eat family meals together at the table without TV or phones.
3. Work with a registered dietitian if you have questions on types of diets and trends to avoid.
4. Encourage questions and conversations about the foods that your family eats.
5. Stock your fridge and pantry with more GO foods and fewer WHOA foods. Your family might find it helpful to have a separate section of your pantry for storing WHOA foods and snacks.
6. Pay attention to what your child chooses to eat and drink. Encourage your child to listen to their body. Encourage them to eat when hungry, eat slowly and stop when their stomach has had enough. Try to limit snacking to only one or two snacks each day.
7. As often as possible, encourage your child to drink plain water or beverages that are low in sugar.
8. Your child doesn't have to give up foods like cake and ice cream. But try to encourage them to have them only sometimes instead of eating them every day.

Chapter 15:

Let's get moving!

What do you think of when you hear the word exercise? You might think about huffing and puffing, your heart beating fast and sweating. For others, exercise is just playing with your friends and having fun.

Exercise doesn't have to mean doing push-ups or running laps. Exercising is simply moving your body. You probably exercise without even knowing it! Running and playing outside, doing activities in gym class and playing sports all count. When you get regular physical activity, you are helping your body stay healthy.



How does exercise help you stay healthy?

Everybody needs exercise. Exercise does lots of good things for your body: It helps make your muscles and bones stronger, keeps you flexible and helps you sleep better. It's also really important for your heart.

Just like the muscles in your arms and legs, your heart is a muscle. It works hard to pump blood through your body every day. When you do aerobic exercise, you give your heart a workout. That makes it better at doing its job.

Aerobic exercise (er-ˈō-bik ek-sər-ˌsīz)

Aerobic exercise is physical activity that makes you breathe harder and makes your heart pump faster. Examples include running, swimming, biking, fast walking and dancing.

How much exercise do you need?

You should try to get at least an hour of exercise every day. But you don't need to get it all at once. Your activity can be spread throughout the day — a little here, a little there and make it fun!

It's also important not to sit too much. Try to keep the time you spend on a screen or laying around to less than two hours each day. Screens include phone, TV, video games or the computer (if it isn't for school). If you've been sitting for a while, get up to stretch your legs and walk around.

What kind of exercise is right for you?

There are lots of fun ways to exercise. You can exercise alone or with family and friends. The key is to find something you enjoy doing. If running isn't your thing, try dancing. If you get bored exercising alone, think about playing sports with a team.

Looking for ideas? These are all types of aerobic exercise that will get your heart pumping and help strengthen your muscles!

- Dancing
- Running
- Swimming
- Martial arts
- Riding a bike
- Jumping rope
- Skateboarding
- Hiking and walking
- Ice skating or roller skating
- Playing outside or at a playground
- Playing a sport like soccer, baseball or basketball

How can you stay active?

The best way to be active is to make it part of your day. Try these tips to make exercise part of your everyday routine:

1. Find some activities you enjoy doing. Exercise comes in many different forms. Find what works for you!
2. Be active as a family. Exercise is even more fun when you're moving your body with family or friends.
3. Make a plan. It can be hard to fit new activities into a busy schedule. Set aside some time for activity every day. If you can't find a whole hour for exercise, find ways to fit in activity in smaller chunks.
4. Limit screen time to two hours or less each day.
5. Try new things — and have fun!

Quiz time!

1. How long should you exercise each day?

   a. 10 minutes

   b. 30 minutes

   c. At least an hour

2. Which of these is NOT a type of aerobic exercise?

   a. Swimming

   b. Playing a video game

   c. Running

3. True or false: Your heart is a muscle.

   ○ True

   ○ False

1. c. At least one hour
2. b. Playing a video game
3. True

Dig deeper

Exercise gets your heart pumping. Here's a chance to find out how much.

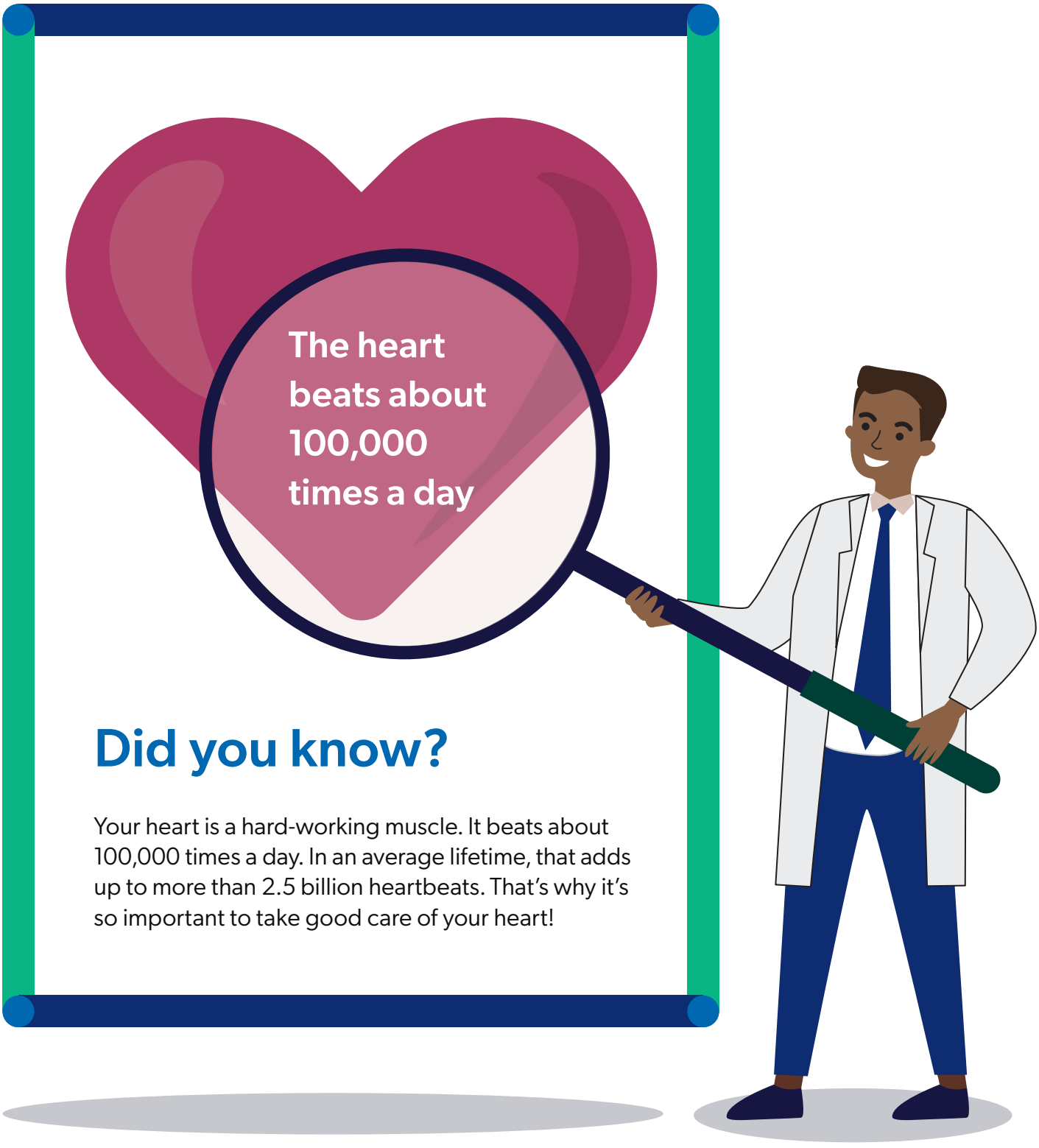
1. Use your fingertips to locate your pulse (heartbeat) on your wrist or your neck. Watch the clock and count how many times it beats in one minute. (If you don't want to wait that long, count the number of beats in 15 seconds, then multiply that number by four. Record it here:

   (Resting heart rate) _____.

2. Run around outside or do jumping jacks for a few minutes. Immediately count your heart rate again and record it here:

   (Active heart rate) _____.

What happened? When you are active, your heart beats harder to give more energy to your muscles. When you move your body regularly, you give your heart a healthy workout. That makes your heart stronger and helps you stay healthy!



Did you know?

Your heart is a hard-working muscle. It beats about 100,000 times a day. In an average lifetime, that adds up to more than 2.5 billion heartbeats. That's why it's so important to take good care of your heart!

A word for parents

Exercise is important for a healthy body. Regular activity helps develop strong muscles and bones, improves flexibility and helps the heart stay healthy. Exercise can also help a person maintain a healthy weight.

Kids should have lots of opportunities to run around, play and be physically active. Playing outside and playing sports are great ways to engage your child in exercise. Being active is good, and the opposite is also true: Sitting around a lot can make your body less healthy.

Try to find ways to limit the amount of time your family is inactive.

What can you do?

1. Encourage your child to be physically active.
2. Limit screen time to two hours or less per day, if not for school. You can try setting time limits for your child's phone, TV or video game use.
3. To encourage good sleeping habits, limit/avoid your child's access to these devices several hours before bedtime and during the night.
4. Try to find enjoyable activities you can do together as a family. Try new things until you find something you all like doing. Exercise can be a lot of fun!

Chapter 16:

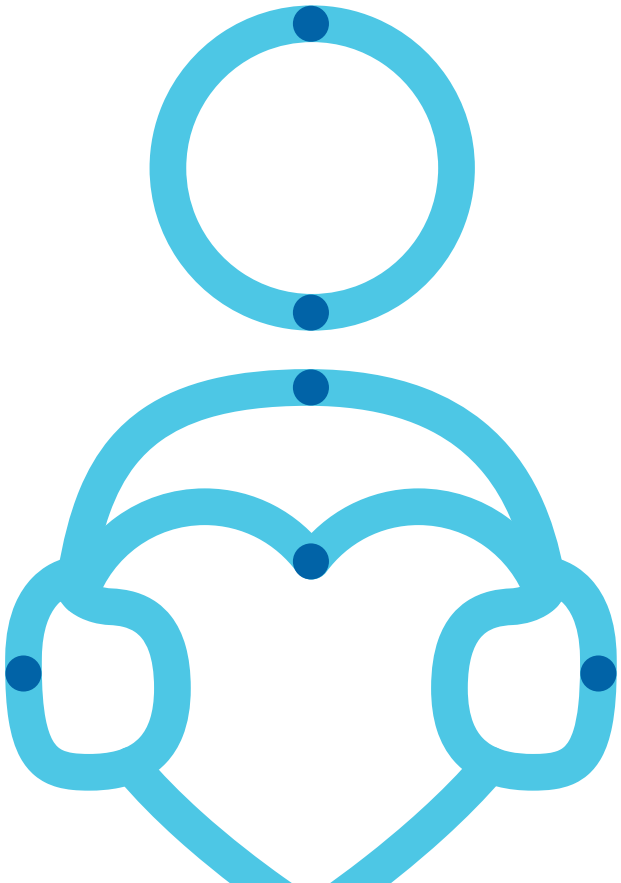
A family of your own

You might not believe it now, but someday you might want to have a family of your own. You have a long time before you need to decide whether you'd like to be a parent someday or not. But there are some things to think about before that day comes.

Parents want their children to be healthy. Having a healthy baby starts with having a healthy pregnancy. High blood sugar, high blood pressure and high cholesterol can be passed down through the genes — from both the mother and the father. Because the baby grows and develops inside the mother's body, she has a unique role during pregnancy.

If a fetus is growing in a healthy environment, there's a better chance the baby will be healthy after it's born.

In this chapter, you'll learn how high blood sugar, high blood pressure and high cholesterol affect pregnancy — and how a mother and her baby can stay healthy.



Fetus (fē-təs)

An unborn baby that develops and grows inside its mother.

How babies grow?

Before babies are born they grow inside their mother in a special space called the uterus, or womb. Inside the womb, fluid surrounds the developing baby. The fluid protects the baby from bumping around, while giving it room to stretch and grow. As the baby grows, it takes in nutrients from the mother. Whenever the mother eats or drinks something, some of those nutrients are shared with the baby. So, you can probably understand why a mother's eating habits are important for the proper growth and development of her baby.

The same goes for other things the mother might take in, including alcohol, drugs and cigarette smoke, which can be harmful to the fetus. In other words, the choices a mother makes can directly influence the health of her developing baby.

Uterus (yü-tə-rəs)

Also called the womb, the uterus is the organ in females where babies develop before birth.

Health conditions and pregnancy

Women with health conditions have some extra things to think about before having a baby. For one thing, the baby might inherit the same condition, such as high cholesterol. The mother's health also affects the developing baby while it's growing in her body. If a mother has high blood pressure, high blood sugar or high cholesterol, for instance, it can affect how the baby grows and cause health problems after the baby is born. For those reasons, it's a good idea for women with health conditions to plan ahead before starting a family. They can talk to their doctor about what they can do to help their baby be healthy both before and after it's born.

Medications during pregnancy

Many young people who have high blood pressure, high blood sugar or high cholesterol start taking medicine to help them stay healthy. Medications that men take don't usually affect a developing baby. However, some of the medications a woman might take to control high blood pressure, high blood sugar and high cholesterol might be harmful for a developing baby.

When a woman is thinking about having a baby, she should talk with her doctor to see if it's safe to continue taking her medications during pregnancy. If not, her doctor may recommend she stop the medication before trying to get pregnant, or immediately if she is pregnant. The mother should not restart her medications again until her baby is ready to stop breastfeeding. Sometimes the doctor may suggest another medication that she can take safely during pregnancy instead. It is always best to ask your doctor what medications and supplements are safe to take during pregnancy.

Quiz time!

1. **True or false: Developing babies can inherit high cholesterol from the mother or father.**

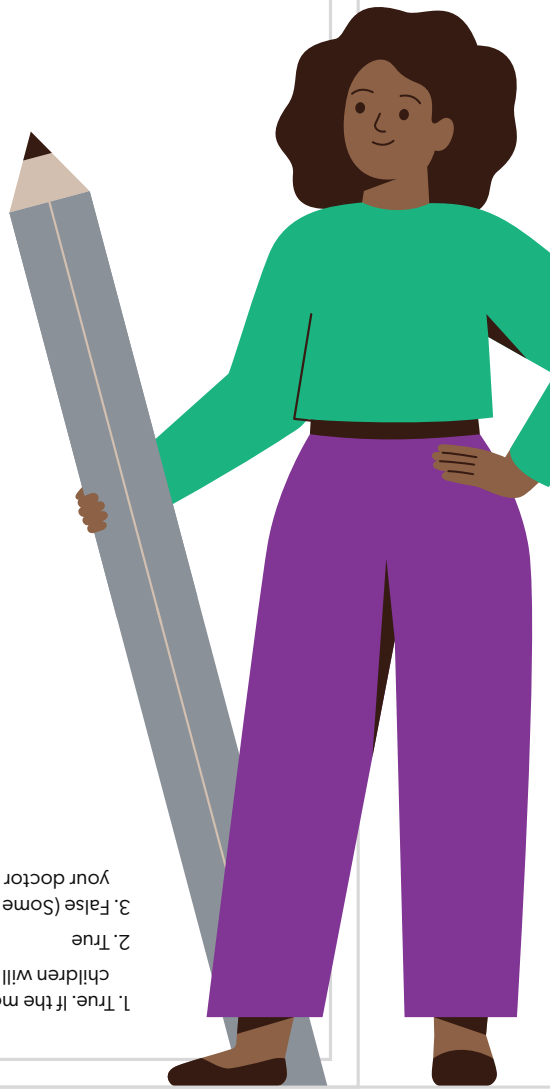
   - ○ True
   - ○ False

2. **True or false: Developing babies get nutrients from the foods their mother eats.**

   - ○ True
   - ○ False

3. **True or false: It's not safe to take any medications when you are pregnant.**

   - ○ True
   - ○ False



1. True. If the mother or father has an inherited form of high cholesterol, half of their children will also have the condition.
2. True
3. False (Some but not all medications are safe during pregnancy. It is always best to ask your doctor what medications and supplements are safe to take during pregnancy.)

Dig deeper

You've learned before how traits are passed down from parents to children. Here's a chance to see how some common traits are passed along in your family. Which of these traits do you have?

- ○ Dimples
- ○ No dimples
- ○ Right-handed
- ○ Left-handed
- ○ I can roll (curl) my tongue
- ○ I can't roll (curl) my tongue

Now survey your family members, such as your parents, grandparents, siblings, aunts, uncles and cousins. How have these traits been passed down through your family? Just like dimples, traits like high blood pressure and high cholesterol can also be passed down through families.

Did you know?

Human babies take about 40 weeks to develop inside their mom's womb — about nine months. Opossums spend just 12 to 13 days inside the womb. And elephants? An elephant mother is pregnant for as many as 660 days. That's nearly two years!

Parents' corner

Most parents look forward to the day they will become grandparents. Even while your children are still young, it's hard not to think about what their futures will look like. Will they go to college or join the military? Will they choose to live close to home or move far away? Will they get married, and if so, will they one day have children of their own?

In this chapter, you've learned a few of the things that can cause health concerns for a mother and her developing child. Some concerns are genetic and can't be prevented — but most can be successfully managed. And planning ahead before pregnancy can help ensure that the developing baby stays healthy.

What can you do?

1. Familiarize yourself with key issues about planning for a healthy pregnancy.
2. When the time comes, talk with your child about the risks and how to manage them.
3. Both boys and girls need to know about the chances of passing on genetic traits, such as high cholesterol, blood sugar and blood pressure.
4. Girls need to be aware of the important role proper nutrition plays before, during and following her pregnancy, for her own health and that of her child.
5. Talk with your children about the importance of planning for pregnancy and prenatal care.
6. Girls should ask a doctor if the medications and supplements they are taking are safe to take while pregnant or breast feeding. If not, you or her doctor should talk to her about preventing unplanned pregnancies.
7. If someone with an inherited medical condition (such as high blood pressure, high blood sugar or high cholesterol) has a baby, he or she should share that information with the child's health care team.

Chapter 17:

Change it up!

Developing healthier habits

Have you ever thought about making a change? Some changes, like the way you wear your hair or set up the furniture in your room, are easy. Changing habits can be harder.

In this chapter, you'll learn why — and how — to make changes for the better.

Why do you need to change?

Why should you change? Good question! Maybe you already do a pretty good job making healthy choices. But nobody is perfect, and most people — kids and adults — can learn to do things a little bit better. If you're like most people, you may have some habits that aren't so healthy.

For example, eating foods and snacks that contain a lot of fat and sugar could cause problems with your blood vessels and heart as you grow older. The same is true if you don't get enough exercise, or if you smoke or vape. Those types of behaviors are potentially harmful for everyone. But if you have risk factors like high blood pressure, high blood glucose and high cholesterol, they can be extra harmful.

The habits you develop when you're young tend to stick around, even when you're an adult. Developing good habits now will make it more likely that you'll be healthy for years to come.

What needs to change?

Your health care team will help you identify any risk factors that might cause health problems in the future. Some of them might have been passed down from your parents — those can't be changed. They're known as non-modifiable risk factors. But many other risk factors are based on the choices you make, like the snacks you eat and whether you're physically active or not. Those are called modifiable risk factors (also known as lifestyle factors).

Modifiable risk factors (mä-də-ˌfī -ə-bəl risk fak-tərs)

Choices you make that can put you at risk of health problems, such as eating a lot of fried, fatty foods, smoking cigarettes or choosing not to exercise.

Non-modifiable risk factors (things you can't change):

- **Family history:** Some traits, like high blood pressure, high blood sugar and cholesterol run in the family and are passed down through genes.
- **Age:** The risk of heart disease goes up as you get older and becomes much higher in older adults.
- **Race and ethnicity:** Some people, like Black, Latino and Southeast Asian people, have a higher risk of heart disease.

Modifiable risk factors (things you can change):

These risk factors can increase your risk of developing heart disease as you get older:

- Other health conditions, such as high blood pressure, high cholesterol and diabetes, which can be caused by unhealthy choices rather than a family trait
- Obesity and being overweight
- A diet high in fat, cholesterol and salt
- Not getting enough exercise
- Alcohol
- Tobacco (including smoking and vaping)

Next time you meet with your health care team, talk about this list. Together, you can discuss what risk factors you have — and which ones that you can change or modify.

What is the best way to change?

Making changes can feel hard and set backs can happen — but a set back does not mean you fail. Every change starts with one small step. Knowing you need to change is actually a great place to start!

Here are some tips that can help you start to change your habits:

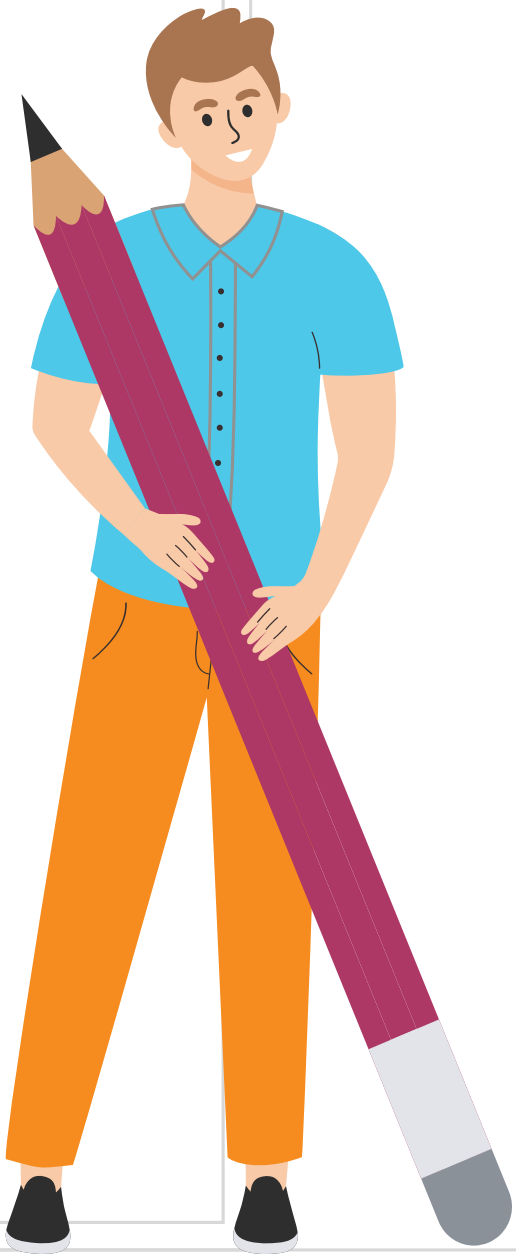
1. **Decide what habit you'll try to change.** You might think of a few. But it's best to just start with one. You'll be more successful changing one behavior at a time.
2. **Make a plan.** Think about why it's important to make a change and how it might help you if you change it. It can help to write down your plan.
3. **Consider what you want your new habit to be.** Be specific! Instead of saying "I want to eat better," for example, you might say, "I'll eat a piece of fruit for a snack instead of cookies or chips."
4. **Next, consider barriers.** Barriers are things that stand in your way of success. What things might keep you from making healthier choices? Sometimes we make unhealthy choices when we're stressed, mad or in a hurry. If these things happen to you, how will you overcome them?
5. **Think about your timeline.** How long will it take you to make changes? Be patient. Changes don't happen quickly. You'll probably even have some setbacks along the way. Just keep trying. When you make a mistake (everybody does), don't give up! Keep working toward your health goals.
6. **Share your plan with someone you trust, such as your parents and your health care team.** They can offer helpful suggestions and encouragement.
7. **Celebrate your success!** Once you have been able to change your behavior, go ahead and pat yourself on the back for a job well done.
8. **What's next?** Once you have been successful in changing one behavior, you can use the same model to change other habits. Soon, you'll be on your way to a healthier lifestyle.

Quiz time!

1. **Which of these is a modifiable risk factor?**
   a. **Age**
   b. **Diet**
   c. **High cholesterol that runs in your family**

2. **Which of these is a non-modifiable risk factor?**
   a. **Diet**
   b. **Race or ethnicity**
   c. **Exercise habits**

3. **Which of these is a benefit of adopting a healthy lifestyle?**
   a. **It will help you get into college.**
   b. **It will help you find a job.**
   c. **It will help you avoid heart disease.**



1. b. Diet
2. b. Race or ethnicity
3. c. It will help you avoid heart disease.

Dig deeper

Questionnaire: Readiness to change

Making good choices is the best way to keep your heart strong and stay healthy. Are you ready to make a change? To find out, check the statement that best describes you at this time. Then take some time to answer the question that follows. (For example, you might answer, "I am getting ready to make changes in my lifestyle" if you've signed up to play a sport or take a new exercise class.)

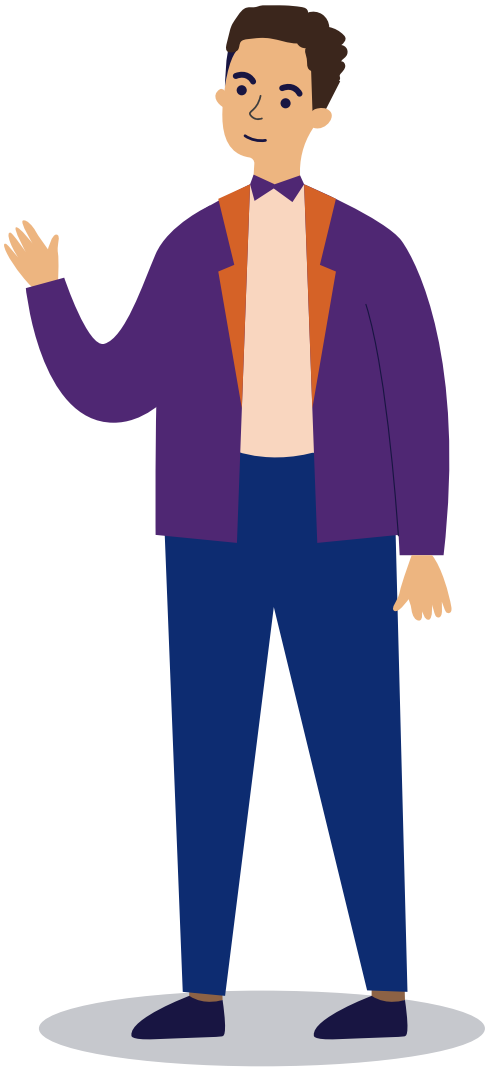
- ○ I don't want to change.
  - Why might it be important to make changes in your lifestyle?
- ○ I am thinking about it.
  - What would keep you from making changes?
- ○ I am getting ready to make changes in my lifestyle.
  - What have you done to get ready?
- ○ I have already made one or more lifestyle change.
  - What changes have you made? Was it hard to make changes?
- ○ I practice my healthy changes almost every day!
  - Congratulations! Now that you have made some lifestyle changes, how does it make you feel? Can you keep it up?

Share your answers with your parent and health care team to see if they agree. If you're not quite ready to change, don't worry! Consider how you might move to the next level. Remember, change happens one small step at a time. And the first step starts with YOU.

Good advice

Habits are hard to change. That's why they're habits, after all! But there are some tricks to help you make healthy changes. Put some of these ideas to work for you.

- **Make a commitment.** Don't just tell yourself you're going to eat more fruits or vegetables, or get more exercise. When you share your goal with family or friends, you're more likely to succeed. They can help you on your way to your goal. And you'll be motivated to show them you can achieve it.
- **Make a swap.** Try trading an unhealthy behavior for a healthy one. If you usually eat a sweet dessert after dinner, for example, skip the dessert and try taking a walk around the block after your meal instead.
- **Reward yourself.** It's nice to be rewarded! Give yourself healthy rewards when you reach milestones toward your goal. If you successfully give up drinking soda, for instance, you might treat yourself by going to the movies or having a sleepover with friends.



Parents' corner

Everybody has habits, including young kids. Those habits direct how we act, what we do and the choices we make. Sometimes, we make choices that can cause us to become unhealthy as we get older — especially if those choices become our usual routine. Habits we develop at a young age often last even when we become adults. That's why teaching children about making healthy choices is a great investment in their futures.

First things first. Does your child need to make lifestyle changes? If so, what things do you feel your child needs to change? Importantly, would your child agree? To be successful at making changes, they need to understand why those changes are worthwhile.

Talk with your child to see how well they understand the benefits of staying healthy. Have your child complete the "readiness to change" questionnaire in this chapter.

When you understand how ready (or not) your child is to making lifestyle changes, you can figure out how best to help them set goals and move toward healthier habits.

Understanding the stages of change

Psychologists have defined five stages that describe the process of change. Understanding these stages will help you to help your child.

1. Pre-contemplation
   "I can't. I won't."

   It's important to understand why your child may feel that way. Would they ever consider making a change? Under what circumstances? Try not to be judgmental or nagging. You are likely to be more successful if you follow your child's lead and don't force the subject. Plan to revisit the issue in a couple of weeks or months to see if your child is willing to reconsider.

2. Contemplation
   "I might. I'm thinking about it."

   Be positive. This is a good place to start! Explore why your child may be considering a change, and ask how you can help. Give them time to ask questions and think it over. Then check back in to continue your discussion.

3. Preparation
   "I will."

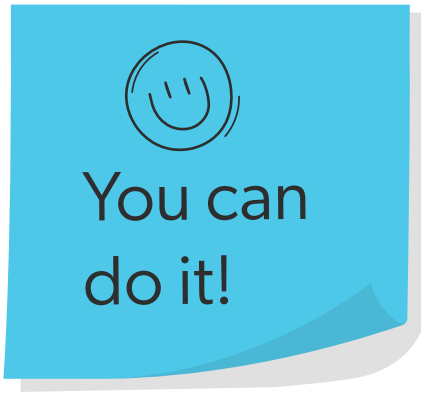
   Bravo! Congratulate your child on making a very grown-up decision. Ask about the habit they plan to change and how they plan to go about it. You can help them set a realistic timeline, too. It takes time for a new behavior to become a habit.

4. Action
   "I am."

   Ask your child about their process and how they feel about their success. Are they feeling more energetic? Are they having any struggles?

5. Maintenance
   "I still am."

   The short-term goal is to make a change. The real goal is to keep it up. Praise your child for being able to make better choices long term. See if they have other changes in mind. If so, talk to them about when and how they plan to start.



What can you do?

1. Start by talking to your child about any concerns you have about their habits or their health. Ask your child to share their own feelings and concerns.
2. Help your child complete the "Readiness to change" questionnaire. Then take action based on their responses.
3. If your child seems open to making changes, talk about potential goals. Help support a plan for achieving those goals, including what your child sees as potential barriers.
4. Tell your health care team where your child is in the process. Ask for help and suggestions for reaching the next level.
5. Change can be difficult, and many children become discouraged. Help your child set realistic goals and avoid trying to change too many things at once.
6. Be supportive and watch for signs of burnout. Keep an eye out for clues that suggest your child is having difficulty. When things get hard, you can help them problem-solve.
7. Inquire about your child's progress. Don't be pushy, but take opportunities to provide helpful tips and encouragement.
8. Remember: Change takes time and missteps will happen. Persistence, patience and parental support are key to making meaningful changes.

A note for parents

Special needs: Only you know what's best for your child

Children with conditions like Down syndrome and autism often have unique health care needs. Some may develop risk factors for heart disease as they grow into adulthood. In this section, we will briefly review these risk factors and what can be done to keep children healthy as they become adults.

Health conditions and healthy habits

Cardiovascular disease — problems involving the heart and blood vessels — is the leadingcause of health concerns in adults. For children with or without disabilities, the same factors increase the risk of heart disease in adulthood:

- High blood pressure
- High blood sugar
- High cholesterol
- Overweight or obesity

Children with disabilities may have other health conditions, too. They may be born with or develop problems with their heart, liver or kidneys. Those problems make it even more important that they take steps to stay healthy.

Many children with disabilities require medications to treat their unique conditions. While such medications are often helpful, they can sometimes cause side effects, like increasing a child's appetite and causing excessive weight gain. Too much weight gain can lead to obesity, which often goes hand-in-hand with high blood pressure, high blood sugar and high cholesterol. As a result, some children with disabilities may be more likely to develop diabetes, even at a young age.

Many tasks, especially those that involve behavior, are difficult for children with developmental disabilities. It can be challenging to help your child with special needs eat a healthy diet and get regular physical activity. You'll probably experience some setbacks. But with patience, persistence and a creative approach, many kids can achieve some degree of success.

You can help your child make changes to avoid future health risks such as diabetes and heart disease, one small step at a time.

A note for parents

Of course, you know best when it comes to your child. But many families find these strategies helpful:

- Avoid using food and snacks as rewards.
- Limit use of television, phones, tablets and other electronic devices.
- Increase physical activity as much as possible. Any amount of physical activity can be helpful to overall health.
- Try to limit activities that require a lot of sitting, such as watching TV. Instead, find opportunities throughout the day to get your child moving, even if it is for a short period of time.
- Encourage age-appropriate portion sizes for meals and snacks. As much as you can, encourage your child to eat vegetables and fruits.
- Create a schedule for meals and snacks. Have meals together as a family and discourage eating outside scheduled snack times.
- Limit high-calorie foods, such as fried foods and sweet treats.
- Skip sugary beverages, such as sports drinks, soda and juices. Also avoid drinking too much milk. Encourage your child to drink water instead. You can add slices of lemon, lime or cucumber to give the water flavor without adding sugar.
- Model healthy eating behavior for your child to follow, and encourage other members of your family to do so as well.

Working with your health care team

If you have a child with developmental disabilities or other unique medical needs, you probably already have a good idea of the strategies that work best for helping your child. Creative approaches to behavior and education are likely to be much more effective than a one-size-fits-all approach. The same is true of health care. What may be a routine clinic visit for some kids, can be a big deal for a child with physical, cognitive or emotional challenges. Taking steps to engage with your health care team can help you and your family stay healthy

1. Talk with your health care team about your child's unique physical and emotional needs.
2. Let your health care team know the best way to communicate with and give directions to your child.
3. Discuss possible challenges and ideas for ways to make your child less frightened during clinic visits, blood tests and other procedures, if they are needed.
4. Tell your health care team if your child's medical conditions or medications change.
5. Let your health care team know what problems or concerns you have. They can help you find solutions.

Notes

Notes

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