

Module 13

Heart Health and Blood Pressure



Module 13 – Heart Health and Blood Pressure

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Please Note

Use of Kidney School does not replace the need to talk with your health care team about your care and your options.

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Congratulations, you've finished the quiz! Here are the correct answers so you can see how you did:

Module 13 – Kidney Quiz Answers





Five-year-old Ally was watering the flowers for her mom with a garden hose one summer day. She put her thumb over the end of the hose to see if she could stop the water from coming out. At first it was easy, but it quickly got harder and harder to hold back the water. Even when she clamped her other hand over her thumb, she couldn't keep the water from spraying out.

We've all tried this. And we know that no matter how hard we push against the flow, the water will win out. Why? Pressure.

Without pressure behind the water to push it through the pipes, it would never find its way to your home—or garden.

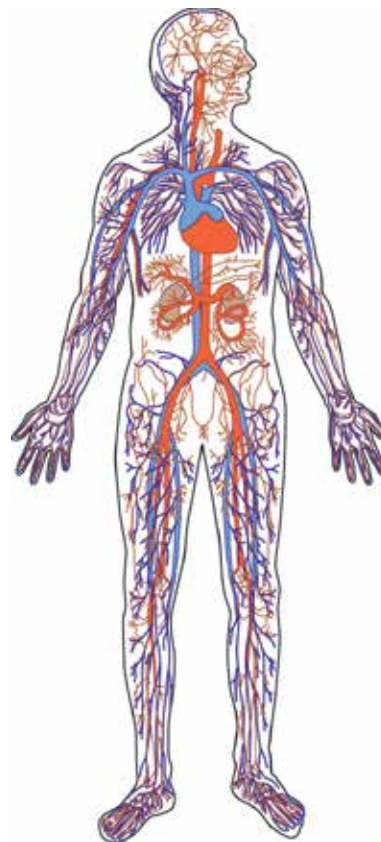
You may have never thought much about it, but pressure is also vital to your health. The type of pressure we'll be talking about in this module is blood pressure. If you have kidney disease or kidney failure, your heart health is also at risk! But if you know what to do, you can lower that risk.

Your heart is your body's pumping station. It pumps your oxygen-filled blood to each part of your body with every beat, through miles of blood vessels—arteries, veins, and tiny capillaries.

Blood pressure is the force of your blood against the walls of your blood vessels. Since your heart beats about 60-100 times a minute, your body gets a fresh flow of oxygen-rich blood each second or so.

There are many ways you can help control your blood pressure. By the time you finish reading this module, you will have a Personal Plan that you can use to better control your blood pressure, your fluids, and your health.

So, let's get started!



The Kidneys and Blood Pressure

Most people don't know that healthy kidneys control blood pressure in two ways:

- 1** Kidneys balance fluid in the body by controlling how much water and salt is reabsorbed into the body and how much is let out in urine.
- 2** Kidneys make hormones that control blood pressure. When the kidneys fail, they may make the wrong amount of these hormones. If this problem with blood pressure and fluid control happens, your body will be less able to respond to changing fluid levels—and your blood pressure may rise. People with kidney disease are many times more likely to have a heart attack or stroke than healthy people because of this.



How blood pressure is measured

You have no doubt had your blood pressure taken when you visit the doctor. The nurse wraps a cuff around your upper arm. Air is forced into the cuff, making it tight around your arm. Each time your blood pressure is checked, two readings are taken:

- 1 The first reading is taken as your heart is pumping blood. This is *systolic* blood pressure.
- 2 The second reading is taken while your heart is resting between beats. This is *diastolic* blood pressure.

Systolic pressure is always higher than diastolic. This makes sense, because the pressure is always greater when your heart is pumping than when it is resting.

Normal blood pressure

A typical blood pressure reading might be 130/80 mmHg. The top number, 130, is systolic pressure. The bottom number, 80, is diastolic pressure. Blood pressure is stated as one number “over” the other, or “130 over 80.”

With chronic kidney disease (CKD), your blood pressure is “normal” if it stays below 130/80.

Recent studies suggest that people with kidney disease should keep their blood pressure even lower: 125/75 or less. But, on dialysis, the target is a bit higher: 140/90 before a treatment and 130/80 after.

Low blood pressure

Some people have low blood pressure, or *hypotension*, like 90/60. If blood pressure is in the low range all the time, it’s fine, but a *sudden* drop in blood pressure can cause a person to feel woozy or pass out.

Passing out is your body’s way of keeping blood and oxygen flowing to your brain. When you are lying down, your head and heart are level, so it takes less pressure to pump blood to your brain.



High blood pressure

High blood pressure, or *hypertension*, is a reading greater than 140/90 but pre-hypertension—also a risk for heart disease and stroke—is anything higher than 120/80. High blood pressure might be 142/90, 154/80, or 158/95, or even higher, like 174/110. More than half of people with kidney disease—and 9 out of 10 people with kidney failure—have high blood pressure.

People with a high systolic *or* diastolic number, are at a greater risk for a stroke, heart attack, or kidney failure—often with no warning sign before it happens. This is why high blood pressure is often called the “silent killer.” High blood pressure can also cause blindness.

Why is high blood pressure so dangerous?

If your blood pressure is low, your blood pushes against your vessel walls gently. But if your blood pressure is high, your blood hits your vessel walls with greater force—like Ally, with her thumb over the end of the garden hose. Over time, this force can harm your blood vessels. This damage includes the smallest, most delicate blood vessels—the capillaries—which are only big enough for your red blood cells to pass through one at a time.





Inside the kidneys, special filtering capillaries called *glomeruli* are scarred by high blood pressure—so they are less able to filter your blood. In fact, high blood pressure is the number two reason for kidney failure.

High blood pressure means your heart has to work extra hard to push your blood through your body. This extra work can cause heart failure—the number one cause of death in people with kidney disease. The high pressure can cause blood vessels in the brain to clog up or even burst, causing a stroke. High blood pressure can also damage blood vessels in the eyes, leading to blindness.

What Is a Heart Attack?

A “heart attack,” or, a *myocardial infarction* (MI), occurs when a complete blockage in an artery feeding the heart keeps blood from reaching part of the heart muscle. Without enough blood, the heart muscle will cramp and die—this is what causes the symptoms of a heart attack:

- Chest or jaw pain that may run down the left arm
- Pressure in the chest or trouble breathing
- Breaking out into a cold sweat
- Nausea or feeling lightheaded or dizzy

Has Your Family Been Tested?

If you have CKD, your parents, brothers, sisters, or children may have it too—and not know it. *Anyone who has a family history of CKD should have their blood pressure and kidney function checked each year.* CKD that is caught early may be able to be slowed—or even stopped in its tracks!

In women, the symptoms of a heart attack can be different. They include:

- Feeling breathless—without chest pain
- Flu-like symptoms, like nausea and cold sweats
- Unexplained fatigue, weakness, or dizziness
- Pain in the upper back, shoulders, neck, or jaw
- Feelings of anxiety

If you have one or more of these symptoms, call 911 for help. Getting care *in the first hour* gives you the best chance for a good outcome.

Heart attacks are often caused by blobs of fat-like plaque in the artery walls. Artery damage from high blood pressure can make plaque more likely

U.S. Blood Pressure Categories for Adults			
	Systolic		Diastolic
Best	Less than 120 mmHg	-and-	Less than 80 mmHg
Pre-hypertension	120-139 mmHg	-and-	80-89 mmHg
High blood pressure (hypertension)			
Stage 1	140-159 mmHg	-or-	90-99 mmHg
Stage 2	≥160 mmHg	-or-	More than 100 mmHg

Source: National High Blood Pressure Patient Education Program



Are You an African American?

People of African-American descent are at higher risk for high blood pressure, heart disease, and kidney disease. So if you are an African American, it is even more vital for you to take good care of yourself and keep an eye on your blood pressure to stay healthy.

to grow. This makes the artery more narrow and easier to clog.

Inflammation seems to play a role in creating plaque and helping it grow in the arteries. A blood test called *C-reactive protein* measures inflammation in the body. These levels may rise years before a heart attack—so this test can be a good early warning sign. Another test of inflammation, the PLAC test, can predict a future stroke or heart attack by measuring inflammation *directly* within our arteries.

What Is Heart Failure?

The Heart Failure Society of America, says that heart failure means, “The heart is not pumping blood through the body as well as it should. As the heart’s pumping action weakens, blood backs up into the blood vessels around the lungs and causes fluid seepage into the lungs.”

The fluid builds up, causing congestion around the lungs that makes it hard to breathe. That is

Slowing CKD Progression

High blood pressure makes the kidneys fail faster. If you have kidney disease, lowering blood pressure can slow the rate of kidney failure, delaying the need for dialysis or a kidney transplant.

why heart failure is sometimes called “congestive heart failure.” Many people with heart failure also have swollen legs and feet.

What Is a Stroke?

According to the American Heart Association (AHA), “A stroke occurs when a blood vessel that brings oxygen and nutrients to the brain bursts or is clogged by a blood clot or some other particle.” The parts of the brain that are starved of oxygen are damaged—often permanently.

Like heart attacks, strokes (“brain attacks”) are more likely when blood pressure is high and plaque builds up, causing clogs. The AHA’s symptoms of stroke include sudden:

- Trouble seeing in one or both eyes
- Severe headache with no known cause
- Numbness or weakness of the face, arm or leg, especially on one side of the body
- Confusion, trouble speaking or understanding
- Trouble walking, dizziness, loss of balance

If one or more of these symptoms is present, call 911. Getting care *in the first hour* gives the best chance for a good outcome.

Risk Factors for High Blood Pressure and Heart Problems

Some lifestyle factors can raise your risk of high blood pressure and heart problems, or make these problems worse. We’ll talk about each of these in a little more detail.





Being overweight and blood pressure: BMI

Research has found that being overweight often goes along with high blood pressure. The higher the weight, the higher the blood pressure. Most people who lose weight also see their blood pressure drop.

There are a couple of ways for you to tell if your weight is about right for your height. One of them is called the Body Mass Index (BMI):

- A BMI less than 18.5 is underweight—which may mean malnutrition.
- A healthy BMI is between 18.5 and 25.
- A BMI between 25 and 30 suggests overweight.
- A BMI greater than 30 means that a person is obese.
- A BMI greater than 40 means very obese.

Ask your doctor to calculate your BMI.

A 10-year study of health in nurses found that people with BMIs from 25 to 30 were more likely to have high blood pressure, high cholesterol, heart disease, and gallstones. The risk of type 2 diabetes was *20 times higher* in people with a BMI greater than 35.

Being overweight and blood pressure: Waist-to-hips ratio

Extra weight around your middle is more of a health risk than weight on your hips. If your waist is the same size as your hips or bigger, you are an “apple.” Apples have higher risks of high blood pressure, heart disease, stroke, and type 2 diabetes. Slim or “pear-shaped” people who carry extra weight lower on the body are at less risk for these problems.



One way to know where you carry fat in your body is the *waist-to-hips ratio*. Using a measuring tape, measure slightly above the level of your belly button. Write down your measurement. Then measure your hips by placing a tape measure around the widest part of your hips. Divide the waist measurement by the hip measurement. Be sure to round to the nearest quarter inch or centimeter (note: $1/4 = .25$, $1/2 = .5$, $3/4 = .75$).

What Is “Left Ventricular Hypertrophy (LVH)?”

LVH is a common cause of heart failure in people with kidney problems, and a leading cause of death. Many people with kidney disease have *anemia*, a shortage of oxygen-carrying red blood cells. Without enough oxygen, your heart has to work harder, and so it becomes thicker, or *hypertrophied*. The left ventricle, the heart’s main pumping chamber, grows bigger to pump more blood. In time, the overworked ventricle can give out.

LVH can begin before you are aware of it. By the time the kidneys fail, nearly 75% of people already have some LVH. To stay healthy with kidney disease, exercise (with your doctor’s okay) and keep your blood pressure in the target range your doctor gives you. Make sure you are tested for anemia and have it treated. An echocardiogram, or ultrasound of the heart, can measure the thickness of your heart muscle and see if you are developing LVH.



Warning: Salt Substitutes Can Harm You

Don't switch to salt substitutes if your kidneys don't work. Many have high levels of potassium and are harmful to people with kidney failure. To learn more about limiting sodium in the diet, read Module 9—*Nutrition and Fluids for People on Dialysis*.

A number greater than 1.0 means that you are an “apple” shape. This suggests that you are at higher risk for heart disease, stroke, and type 2 diabetes. Talk to your doctor or a registered dietitian about how to lose weight, exercise, reduce your risk—and stay healthier.

Reducing salt in your diet

Salt makes your cells hold extra fluid. Eating a salty diet can raise the amount of fluid in your body. Too much fluid raises your blood pressure and makes your heart work harder. Salty foods also make you thirsty so you drink more fluids—making the problem worse, since your kidneys may not remove some or all of it.

In some cases, eating less salt can help lower blood pressure. People who start to limit salt find that it's hard at first. But after a few weeks, they like the way foods taste and find common foods—like snack foods, canned soups, and deli meats—much too salty!

If you have high blood pressure or you are on dialysis or have a transplant, your doctor may ask you to keep your daily sodium to 2,000 milligrams or less. It helps to learn how to read food labels, choose low sodium foods, and track your daily intake in a notebook. A renal dietitian can help you.

Blood pressure and smoking

If you smoke, having a cigarette may *feel* relaxing. But inside your body, smoking has the opposite effect on your blood vessels. The nicotine in cigarettes stiffens blood vessels—which raises blood pressure.

Smoking may also cause tiny injuries to the inside of the arteries, which makes plaque more likely to build up. This is one reason smokers are more likely to have heart attacks.

We've just said that smoking tightens blood vessels. This includes blood vessels in your kidneys! If you

Risk Factors for High Blood Pressure and Heart Problems

Risk Factor	Why?
Being overweight	Makes the heart work harder to pump blood
Salty/high sodium diet	Makes the body retain extra fluid, which means more blood for the heart to pump
Smoking	Narrows the blood vessels and makes the heart work harder
High cholesterol	Narrows the blood vessels and makes the heart work harder
Heavy alcohol drinking	Reasons unclear
<i>If you are on dialysis, gaining too much fluid</i>	More blood volume raises blood pressure and makes the heart work harder between dialysis treatments





have kidney disease and you quit smoking, you can help your kidney function last as long as possible.

High cholesterol and blood pressure

The National Cholesterol Education Program began its work more than 30 years ago to teach Americans about the dangers of high cholesterol. So you may know that cholesterol is a waxy fat. It can build up inside your arteries, causing plaques that can stop blood flow and lead to heart attacks or strokes.

The insides of your arteries have a smooth lining so blood can flow freely. High blood pressure can cause tiny tears in this lining that allow waxy blobs of plaque to form and grow inside the vessel. Plaque can narrow the arteries so it is hard for blood to pass through—further raising blood pressure.

Ask your doctor about your last cholesterol blood test. To reduce your risks of heart attacks and stroke:

- Your total cholesterol should be less than 200mg/dL.
- Your HDL, or “good” cholesterol, should be 60 mg/dL or higher if you are a woman, and 55 or higher if you are a man.
- Your LDL, or “bad” cholesterol should be 100 mg/dL or lower.
- Your triglycerides should be less than 150 mg/dL.

Some doctors test how many cholesterol carrying particles you have in your body. These particles, called LDL-P, may be an even more accurate way to help you identify and treat your cholesterol risk.

If your cholesterol levels are too high, there are some things you can do:

Quitting Smoking

If you want to quit smoking, how can you succeed? The answer depends on why you smoke and what you get out of it. Some people have had success with:



- A “buddy” system—working with a friend
- A reward system—putting cigarette money toward another goal, like a trip or a new bicycle
- Quitting “cold turkey” by picking a day and getting rid of all cigarettes
- Nicotine patches or gum to help get over the hurdle
- Cutting down, day by day
- Hypnosis

Quitting smoking isn’t easy, but when you succeed, it’s something you can feel really good about. You will also feel better and be able to do things like climb stairs more easily.

- **Eat fewer “white” foods.** Rice, white potatoes, white bread, cakes, cupcakes, cookies, etc. all have one thing in common: low fiber and lots of sugar in the form of simple carbs. These foods raise cholesterol and triglyceride levels—and cutting back helps lower your levels. Choosing whole grain breads, sweet potatoes, or other squash as starches, as well as vegetables and fruits can improve your health (and they taste great, too).
- **Eat foods lower in saturated fats.** Saturated fats are solid at room temperature, like butter, margarine, lard, Crisco®, and the fats in red meat. Unsaturated fats are liquid at room temperature. They can be found in nuts, fish, and oils, like olive oil, sesame oil, and cooking oils.



- **Lose weight if you are overweight.**
- **Get active!** Thirty minutes of physical activity a day can help lower your bad (LDL) cholesterol, and raise your good (HDL) cholesterol—and help you lose weight. Talk to your doctor if you have not been active lately or need help from a physical therapist to get moving.
- **Ask your doctor about a “statin.”** These cholesterol lowering drugs (like Pravachol®, Zocor®, Lipitor®, etc.) can help reduce the risk of a heart attack. If your doctor prescribes a statin, ask if you should take the supplement Coenzyme Q10. Statins deplete CoQ10 in the body, and can cause muscle weakness. Studies have found that giving CoQ10 supplements to people on dialysis

What Is “Metabolic Syndrome?”

Metabolic syndrome is a cluster of health problems that raise the risk of heart disease, high blood pressure, strokes, and type 2 diabetes. The National Cholesterol Education Program says that metabolic syndrome includes three or more of the following:

- Fasting blood sugar of 100 mg/dL or more
- Serum triglyceride levels of 150 mg/dL or more
- Serum HDL (“good”) cholesterol less than 40 mg/dL in men or 50 mg/dL in women
- Blood pressure greater than 130/85 mm Hg
- Waist bigger than 40 inches in men or 35 inches in women

If you have metabolic syndrome, your best chance to avoid health problems is to exercise for 30 to 60 minutes a day, lose weight, and quit smoking if you smoke. Losing even 5% of your body weight can reduce your health risk.

does help. Muscle pain on statins should be reported to your doctor right away.

Alcohol and blood pressure

Moderate drinking—one drink per day for women and up to two a day for men—is linked with a lower rate of heart problems. But for reasons that are not yet clear, drinking more than this is harmful to the heart and can raise blood pressure. Alcohol also has “empty” calories, which can add to unwanted pounds, and sugars, which must be accounted for if you have diabetes. Also, drinking alcohol makes some people snack more, and then gain weight from the extra calories.

Diabetes and high blood pressure: The double whammy

All of these risk factors we’ve just talked about are very important. But diabetes and high blood pressure together are a “double whammy” that is extra hard on your body. Diabetes damages the blood vessels:

- Large blood vessel damage can affect the heart and blood flow to the legs, making heart disease and limb loss more common.
- Small blood vessel damage can affect the eyes and kidneys, making blindness and kidney disease more common.

For these reasons, diabetes is the leading cause of limb loss, blindness, and kidney disease in the United States. Adding high blood pressure to diabetes can make any damage occur much faster.

If you have ever been diagnosed with diabetes, then it is very important that you do all you can to control your blood sugar. This means:

- Testing your blood sugar as often as your doctor suggests



- Taking your diabetes medicines
- Following your meal plan
- Keeping your weight under control
- Getting regular exercise

If your blood sugar is not well controlled, your blood pressure won't be, either. As many as five million Americans may not know that they have type 2 diabetes, the form that usually occurs in adults. Most people with type 2 diabetes don't find out for up to 10 years.

You should be tested every year for diabetes if any one of these is true:

- You have a family history of diabetes. If one of your parents has type 2 diabetes, you are at a 40% risk yourself.
- Your BMI is greater than 25.
- You are an "apple" shape, who carries body fat around your middle.
- You are over 65 years of age.

Not sure if you've been tested for diabetes? Ask your doctor!

Over-the-counter medications and high blood pressure

Many cold and flu remedies have ingredients that can raise your blood pressure. Decongestants—drugs to help a stuffy nose—are the usual culprit.



Ask your doctor or pharmacist to suggest a cold or flu remedy that won't raise your blood pressure.

How do you know if your heart is healthy now?

Your doctor may order tests of your heart function, either routinely or if he or she suspects that you may have a problem. These tests may include:

- **A blood test for C-Reactive Protein (CRP).** This low-cost test measures inflammation anywhere in the body. The Centers for Disease Control and Prevention and the American Heart Association suggest that anyone at risk for heart disease think about having this test. An average CRP level in the United States is 1.5. Levels greater than 3.0 suggest an increased risk of heart problems.
- **A blood test for homocysteine.** Homocysteine is an amino acid your body produces. In high levels, it can irritate blood vessels, increase blood clotting, and raise levels of "bad" cholesterol. A healthy homocysteine level is less than 12 micromols per liter. Folic acid and vitamins B6 and B12 or foods containing folic acid—like leafy green vegetables, spinach, asparagus, and cereals—can help bring down a too-high homocysteine level.
- **A blood test for artery inflammation: the PLAC test.** High values of this test have been shown to predict future heart attacks and strokes. Drugs like statins and niacin have been shown to lower levels of this test.
- **A blood test for LDL-P.** This test measures the precise number of cholesterol-containing particles you have in your blood. Knowing this number can help doctors treat your cholesterol problems more effectively.



- **A chest X-ray.** Can show abnormal deposits of calcium inside the heart or large blood vessels.
- **An electrocardiogram (EKG or ECG).** This test uses electrodes placed on the chest, arms, and legs to measure electrical activity inside the heart. It takes about 5 to 10 minutes and can reveal problems with the heart rhythm, as well as a heart attack or even LVH.
- **An echocardiogram.** This 30-minute test uses an ultrasound probe on top of the chest to take pictures of the inside of the heart as it beats. Echocardiograms can show the size of the heart chambers, strength of the heart muscle, presence of fluid around the heart, problems with heart valves, or a change in pressure inside the heart.
- **A cardiac stress test.** This test measures the health of the heart when it is under stress, usually through exercise—walking or running on a treadmill or riding a stationary bike. Some patients who cannot exercise may receive medications instead to stress the heart. Electrodes are used to monitor the heart during the test. Stress tests can look for silent heart disease (heart disease with no symptoms—more common in people with diabetes and high blood pressure), measure exercise tolerance, and determine if stress causes an abnormal heart rhythm.
- **A CT Coronary Angiogram.** This is a very rapid CAT scan (about 10 seconds) that uses contrast dye to look at the arteries that feed your heart. It is a less-invasive way to get pictures like those from angiograms, or cardiac catheterizations.
- **Angiogram (cardiac catheterization).** This 30-minute test is done by threading a catheter tube through a needle from a blood vessel in the arm or leg into the heart. The catheter can then measure pressures inside the heart and check the arteries for blockages. Contrast dye is used, and photos of the heart and blood vessels are taken during the test. You may need to lie flat for several hours afterward to allow the small incision in your leg or arm to close up.

What Do I Need to Know About Contrast Dye?

Contrast dye can damage the kidneys. This can make your kidney disease progress more quickly. Taking a medication called Mucomyst® (N-acetylcysteine) starting the 12 to 24 hours before a test may help prevent kidney damage from contrast dye. Mucomyst® is a liquid that can be mixed with juice or a soft drink to mask its sulfur smell. Other things you can do to protect your kidneys are:

- Ask the radiologist to dilute the contrast dye as much as possible
- Drink plenty of fluids

- Avoid over-the-counter pain pills when you will be having a dye test

A contrast dye called *gadolinium* has been linked with a rare complication in people with kidney problems that causes the skin and internal organs to become rigid. “Nephrogenic systemic fibrosis” can cause death. Be sure to tell the radiologist that you have kidney problems before having a test with contrast dye.





Blood Pressure and Gaining Too Much Fluid Weight (for People on Dialysis)

One of the biggest challenges for people on dialysis is staying within fluid limits. It's hard to balance short-term pleasures—like a glass of cool lemonade on a hot day—with long-term problems like high blood pressure and heart failure.

It's your body and your choice. But to choose well, you need to know that *each time* you gain extra fluid, your heart has to struggle a little bit to handle the extra blood volume. And, once stretched and thickened, your heart may never go back to its normal size.

Over time, the stretching and thickening and the extra work your heart has to do to pump all the extra blood through your system can cause heart failure—the leading cause of death for people on dialysis.

Limiting fluids

If you don't want heart failure, limit your fluid intake. But there's another good reason to watch your fluids if you are on standard in-center HD: taking off a lot of fluid all at once is very hard on your body. During a treatment, you may even have *low* blood pressure (hypotension).

Low blood pressure at HD feels *awful*. You may be dizzy or faint, break out in a cold sweat, feel panicked, or vomit. You may have severe, painful cramps in any muscle in your body. You can avoid much of this if you limit your fluid gains and know your dry weight (your weight without any excess fluid).

How do you know if you are gaining too much fluid?



Here are some signs that you should talk to your care team about. Check the ones that apply to you:

- On my bathroom scale, I've gained more than my doctor suggested.
- I have puffiness under my eyes.
- My feet or ankles are swollen. I may even be able to dent them when I press with a finger.
- My hands are swollen.
- I feel more tired than usual.
- My blood pressure is higher than usual.
- I feel short of breath.
- I have a headache.
- Other:

So, you can see that fluid overload can cause a number of problems, including high blood pressure. What can you do to protect against fluid overload? Lots.

Your doctor or dietitian will give you a daily fluid limit. If you avoid salt, you won't feel as thirsty.



To stay as healthy as you can, stay within this limit. You'll look and feel better right after and between dialysis sessions. And your blood pressure will be under better control, too. It is vital that you know just how much fluid to take in each day. This is one of the biggest steps you can take to keep your heart healthy. Here are some proven ways to drink less fluid. Check the ones that you'd like to try:

- ❑ Drink only when you are thirsty, and just enough to satisfy your thirst.
- ❑ Take pills or capsules with a spoonful or two of applesauce or pudding instead of fluid.
- ❑ Drink from small cups or glasses.
- ❑ Eat a piece of cold fruit.
- ❑ Cold fluids are more thirst-quenching. Freeze ice cubes or small popsicles from your favorite low-potassium juice. One half cup of water equals one cup of ice so your fluid goes further.

What Is "Pericarditis?"

The pericardium is a thin layer of tissue that covers the surface of your heart. The pericardium helps anchor your heart in place and protects it from infection.

Kidney disease makes this lining more likely to become inflamed—this is *pericarditis*. If you have pericarditis and fluid overload, fluid can build up between your pericardium and your heart.

This is dangerous, because the extra fluid can squeeze your heart so it can't beat as well. You would notice shortness of breath and chest pain. Pericarditis can be serious and needs prompt medical attention.



- ❑ Keep a spray bottle in the refrigerator and mist your mouth with a cool liquid.
- ❑ Check with your doctor to see if any medications you are taking cause dry mouth.
- ❑ Eat cereal or soup with a fork. This will leave you more fluid to drink later.
- ❑ Suck on a sour or mint hard candy, a lemon wedge, frozen grapes, or chew gum to stimulate saliva in your mouth.
- ❑ Each day fill a jar with the water equal to your daily fluid limit. Every time you drink, pour that amount from the jar. You will be able to see how much you have left.
- ❑ Limit salt! You'll be much less thirsty if you do.
- ❑ Control your blood sugar if you have diabetes.

Get more dialysis to have more fluids

You don't want to have to live with rigid fluid limits? Choose a type of dialysis that removes much more fluid more gently—like daily or nocturnal home HD. To learn more, visit Module 2—*Treatment Options for Kidney Failure*.





Staying Heart Healthy

The good news about high blood pressure and heart disease risk is that you *can* do something about it! This may mean lifestyle changes and medication. We'll tell you about both.

Your starting point is to know your numbers and your doctor's plan. Ask for your blood pressure readings and your target blood pressure for your age and condition. Write these numbers down so you can compare them to future readings.

If you are on dialysis, you'll need to know what your blood pressure is and how you're doing with your treatment, in order to keep your heart healthy. This means checking your blood pressure often—*but never on your dialysis access arm because it can damage your access*. Since you cannot “feel” when your blood pressure is high, this is the only way to know what is happening. There are several ways you can do this:

- The best way, if you can afford it, is to buy a home blood pressure monitor you can use a few times a day. This will tell you a lot about your blood pressure patterns and how you respond to treatment. Most drugstores sell blood pressure monitors, and your doctor can suggest a good one. A home blood pressure monitor may cost about \$50. Insurance may or may not cover it. Ask your nurse or doctor to show you how to use it.
- Another way to track your blood pressure is to use the blood pressure machines found at many drugstores. These are usually free or sometimes 25 cents, but may not always give correct readings.

- A third way, if you are on standard in-center HD and can't afford a blood pressure cuff for home use, is to ask for your blood pressure readings during dialysis. Also, some dialysis centers provide blood pressure monitors for their patients.

Here are some things *you* can do to control your blood pressure and help keep your heart healthy:

- Eat a healthy diet and maintain a healthy weight. If you have kidney failure, eat a diet that suits the treatment you chose. Standard in-center HD has the strictest diet and fluid limits. Daily HD and PD have somewhat fewer limits. For the most normal diet and fluids, do nocturnal HD at night while you sleep. It removes the most fluid and toxins. If you have a transplant, you will need to watch calories, limit salt, and drink plenty of fluids.
- Get regular exercise
- Take your blood pressure pills as prescribed
- If you smoke, quit
- If you drink alcohol, do so in moderation
- If you are on dialysis, know what your dry weight should be and work to keep it there

How Can I Know When My Blood Pressure Is High?

Some people believe that they can “feel” when their blood pressure is higher than normal. They may get a headache or feel tense or stressed. The truth is, this may or may not match up to when blood pressure is *really* high—either some or all of the time. The only way to know for sure is to measure it.



Eat a healthy diet and maintain a healthy weight

America may have the most diverse food supply of any nation—but we also may have some of the worst eating habits. Study after study shows that eating right can pay off in a healthier life. What's a healthy diet?

- **Fresh fruits and vegetables.** Try to eat a rainbow each day (but be sure to stay within your potassium limits if you are on dialysis): Red apples, raspberries, or watermelon. Orange apricots or carrots. Yellow corn, summer squash, or fresh pineapple. Green asparagus or lettuce. Blueberries. Purple eggplants or blackberries. The micronutrients that give



fruits and vegetables their beautiful colors also help protect your health.

- **Lean meats, chicken, fish, and vegetable protein.** Your doctor may suggest that you eat more or less protein, depending on how your kidneys are working. If you eat beef or pork, choose leaner cuts for less fat. Add oily fish, such as salmon, to your diet a few times a week for omega 3 fatty acids that protect your heart. Cook chicken with skin on to keep it moist, then don't eat the skin. Beans, nuts (and peanut butter), and soy products like tofu also have protein. These tend to be less complete proteins than what is found in meat and fish. If you are on dialysis, you may need to limit beans, nuts, and soy because they are high in phosphorus.
- **Whole grain cereals and breads.** Many cereal and bread products have lots of added sugar. Read labels and look for cereals with at least 4 grams of fiber per serving. Seek out tasty whole wheat, multigrain, or oatmeal breads instead of plain white bread. Keep doughnuts, cookies, brownies, high-fat muffins, toaster pastries, etc. as a rare treat—not daily fare.
- **Unsaturated fats.** Cook with heart-healthy extra virgin olive oil or safflower oil instead of butter, Crisco®, or lard. Read labels to look for saturated fat where you might not expect to

White Coat Hypertension

Certain behaviors—like visiting a doctor's office, or talking when your blood pressure is read—can raise your blood pressure reading. You may get a more accurate result if you check your blood pressure at home.

Still, if your blood pressure goes up at the doctor's office, it may also rise when you're stuck in traffic, upset at work, or having a fight with someone. If high blood pressure is the way your body reacts to stress, you need to get treatment for it.

As one dialysis patient noted, *“I have been taking my own blood pressures for years; it is how I know that it drops after treatment and eating. Yesterday I left the unit with a standing blood pressure of 142/87. My blood pressure was 128/79 when I arrived home 45 minutes later. An hour after eating, my blood pressure dropped to 102/62 and remained there. This morning it was 132/82 and dropped to 105/62 after eating breakfast.”*



find it. U.S. food makers are required to label food that contains **trans fats (partially hydrogenated oil)**—oils that are made solid at room temperature by injecting oxygen into them. The body does not process these fats well, and they can cause heart disease and may help trigger type 2 diabetes. Trans fats are found in most margarines, and baked goods like crackers, cookies, even macaroni and cheese. Read food labels and avoid products that list “partially hydrogenated oils” in the ingredients.

- **Reduced salt.** Hidden salt is very common in fast foods, sauces, and in processed foods, like deli meats, dried mixes, “Helpers,” pickled foods, canned soups, and even cottage cheese. Learn to read labels for sodium.
- **Low-fat dairy (if you are not on dialysis).** Milk is a great source of calcium—and skim milk has just as much as 2%. Try low-fat sour cream, yogurt, and ice creams instead of the full-fat versions. Don’t like the taste of low-fat cheese? Eat the real thing—in a smaller portion.

Get regular exercise

Regular exercise is a great way to:

- Make your heart stronger.
- Make your lungs more efficient.
- Keep your blood vessels open.
- Fight fatigue (really!).
- Keep you thinner.
- Reduce the chance of falling and hurting a muscle or bone.
- Sweat off some of the excess water you might have in your body.
- Help you relax.

Try to be active for part of each day if you can—whether it’s gardening, yoga, swimming, walking with a friend, riding an exercise bicycle, bowling, or any other activity you enjoy doing. You’ll feel better. As one patient said:

“Prior to being diagnosed with kidney failure I had joined a local gym and was walking on the treadmill three times a week. There were stairs that led up to the second story exercise room. At first, I could not get up those steps without severe tiredness in my legs. I’ve heard it said that kidney patients have trouble with stairs. Well, after about 2 months of going to the gym, I could run, skip, and jump up the stairs with no problems. That showed me that a big part of our problem is simply being out of shape.”

Talk to your doctor before starting a new activity program. To learn more about staying active, read Module 12—*Staying Active with Kidney Disease*.





Take your blood pressure pills as prescribed

Many people need medicine to control high blood pressure. People with CKD and kidney failure tend to need pills to lower their blood pressure. In fact, many people with CKD need two or more blood pressure drugs to bring their blood pressure into a normal range.

You may not like to take drugs. But in many cases, lifestyle changes may not be enough to control your blood pressure. When you combine drugs with lifestyle changes, you have the best chance of keeping your blood pressure in the healthy range.

Though rare, you may be allergic to a new drug, and all drugs may have side effects. Your doctor and pharmacist can help you sort out which is which. Many side effects ease up in time, when your body gets used to a new drug. At the end of this module, we'll give you a handy chart that will list possible side effects of blood pressure pills.

Report any new symptoms right away—but don't stop taking a blood pressure pill unless your doctor tells you to. Stopping some drugs suddenly can be harmful. When you start a new blood pressure pill, avoid driving or using heavy machinery until you know how it affects you.



Blood pressure pills can only work if you take them the right way. This means understanding—and believing—that your blood pressure may be high even when you *can't* feel it. Taking your blood pressure pills only when you think your pressure is high won't work. Here are some other tips to help you take your blood pressure pills so they will work best for you. Check the ones that might be helpful to remember:

- ❑ **Not sure how to take a new blood pressure pill?** Read the label and talk to the pharmacist. Ask about when and how often to take the pills, and whether they need to be taken with or without food.
- ❑ **Can't recall when to take your pills?** Try a medication reminder box, a timer, or figure out a way to fit your pills into your daily routine.
- ❑ **Missed a dose?** Take it as soon as you remember, unless it is almost time for the next dose.
- ❑ **Can't afford your pills?** Talk to your doctor. There are so many blood pressure pills on the market that a cheaper one may work just as well. Your doctor may have samples, or some drug companies may offer discounts or free medications to people who cannot afford them. Don't borrow, trade, or lend pills, though. A blood pressure pill that works well for someone else may not work for you, and vice versa.
- ❑ **Side effects make a blood pressure pill too hard to take?** Talk to your doctor. A different drug in the same (or a different) class may cause fewer problems and work just as well.
- ❑ **Worried about drug interactions?** Talk to your doctor and pharmacist about *all* of the medications you are taking so they can alert you.
- ❑ **Not sure how to store your pills safely?** Keep them in a cool, dry place, like a cupboard.





Blood pressure pills: a closer look

Blood pressure drugs come in “classes.” Each class works in the body in a different way to help bring down blood pressure. You can sometimes tell the class of a blood pressure drug by looking at the last few letters of the generic name. We’ll tell you a little bit about the eight classes of blood pressure drugs here:

- 1 Diuretics
- 2 ACE inhibitors
- 3 Angiotensin receptor blockers (ARBs)
- 4 Beta blockers
- 5 Calcium channel blockers (CCBs)
- 6 Alpha blockers
- 7 Centrally acting agents
- 8 Vasodilators

We’ll give you a chart of common blood pressure drugs, side effects, and cautions to watch for in the Personal Plan at the end of this module.

Diuretics

Diuretics are a class of blood pressure drugs that work by not letting the kidneys reabsorb salt, which causes the body to hold water. Diuretics, often called “water pills,” cause you to make more urine. If you have kidney failure, you would only take diuretics if you still make some urine. If you are allergic to sulfa, ask your doctor or pharmacist before taking a diuretic. Some diuretics contain sulfa.

A national, 8-year study of blood pressure control in more than 33,000 people over age 55 was released in 2002. This study, paid for by the National Heart, Lung, and Blood Institute, found

Do You Take Lithium?

ACE inhibitors can increase lithium levels. So if you need to take both, you may need to have your lithium levels adjusted.

that diuretics worked better—and were much cheaper—than some newer blood pressure drugs, and should often be tried first.

ACE inhibitors

ACE inhibitors are a class of blood pressure drugs that work by relaxing your arteries. The generic names of ACE inhibitors end in the letters “pril.” Some common generic names for ACE inhibitors are captopril (Capoten®) and ramipril (Altace®).

The “ACE” in ACE inhibitors stands for *angiotensin converting enzyme*. Angiotensin is a hormone made by the kidneys that tells your blood vessels to “tense up” or narrow. This causes blood pressure to rise. ACE inhibitors block response to an enzyme that helps convert angiotensin, so blood vessels stay relaxed and blood pressure is lower.

Many studies have shown that *ACE inhibitors can help slow the rate of CKD* in people with high

Ace Inhibitors and High Potassium Levels

An ACE inhibitor can increase the level of potassium in your body, which can stop your heart. Signs of too-high potassium include:

- Numbness or tingling in lips, hands, or feet
- Arrhythmia (irregular heart rhythm)
- Confusion, mental changes, or moodiness
- Shortness of breath or trouble breathing
- Heaviness or weakness of the legs



blood pressure or diabetes *who are not yet on dialysis*. ACE inhibitors are the drug of choice in people who have protein in their urine—even if blood pressure is normal. But, if your high blood pressure is caused by renal arteries that are too narrow, ACE inhibitors can make this problem worse. Taking ACE inhibitors with over-the-counter pain pills can also damage the kidneys.

If you are not yet on dialysis, swelling of the hands, feet, or face can be a sign that your kidney disease is getting worse. But if you are taking an ACE inhibitor, swelling can be a side effect of the medication! How can you tell the difference? You can't—but your doctor can. If you notice swelling, ask your doctor to test your kidney function.

Some people have a persistent, dry cough when they take ACE inhibitors. If this cough doesn't go away, you may need to switch to an ARB. We'll talk about those next.

Angiotensin receptor blockers (ARBs)

ARBs work by blocking the action of angiotensin in the arteries, so blood vessels stay relaxed. The generic names of ARBs end in “sartan.” Some common ones are losartan (Cozaar[®]), valsartan (Diovan[®]), and irbesartan (Avapro[®]).

Like ACE inhibitors, studies have shown that ARBs help to protect the kidneys of people who are not yet on dialysis, and who have diabetes and protein in the urine (a sign of kidney damage). Because ARBs don't cause a cough, they are often used in people who can't take ACE inhibitors.

Beta blockers

Beta blockers lower high blood pressure by blocking the effects of the body's natural stimulant: adrenaline. This can slow the heart rate, relax the arteries, or do both. The generic names of beta

blockers end in “lol.” Some common beta blockers include metoprolol (Lopressor[®]), propranolol (Inderal[®]), and atenolol (Tenormin[®]).

Beta blockers are more complex to take than the blood pressure drugs we've talked about so far. Why? Because they are more likely to interact with other drugs, make other medical problems worse, and cause side effects. But sometimes a mix of blood pressure pills is needed to reduce high blood pressure. So, the benefits of beta blockers may outweigh the risks.

Be sure to tell your doctor and pharmacist about any other medical problems you have. *If you have any of these conditions, a beta blocker may not be the best choice for you:*

- Diabetes (beta blockers may raise your blood sugar or reduce the symptoms of low blood sugar)
- Asthma, hay fever, chronic bronchitis, or emphysema
- Food or dye allergies (beta blockers may make them worse)
- Abnormal thyroid
- Poor circulation to your hands or feet
- An already-slow heart rate

If you need a beta blocker, certain foods or drinks, like—caffeine, cough and cold remedies, antihistamines, alcohol, and aluminum-based antacids or phosphate binders—may make it less effective.

Calcium channel blockers (CCBs)

Calcium channel blockers work by keeping calcium from entering the muscle cells of the heart and blood vessels. This slows the heart rate and relaxes the arteries, reducing blood pressure.





Many CCBs end in “odipine.” Two common CCBs are amlodipine or (Norvasc[®]) and felodipine (Plendil[®]).

If you need to take a CCB, be careful what you drink! It’s safest to avoid alcohol entirely—or you’ll risk a drop in blood pressure. In quantities over one quart per day grapefruit juice can cause CCBs to build up to toxic levels in your body. Eating a daily grapefruit may be okay if it fits into your potassium limits. Check with your doctor or pharmacist.



Alpha blockers

Alpha blockers work by blocking the effects of stress hormones, like adrenaline, on the “alpha receptors” in your heart. This keeps your heart rate from going up when you are under the usual stresses of everyday life. Alpha blockers also keep your arteries from narrowing. Some common alpha blockers include doxazosin (Cardura[®]) and prazosin (Minipress[®]).

In men, alpha blockers may also be used to treat prostate enlargement (benign prostatic hypertrophy).

Centrally acting agents

Centrally acting agents reduce blood pressure by relaxing the small arteries. These drugs have been

used for many years, often with diuretics. Common ones include clonidine (Catapres[®]), and methyldopa (Aldomet[®]), which can be used safely in pregnancy. Clonidine can be taken as a pill—or by a skin patch.

These types of blood pressure drugs can make you feel dizzy or drowsy, so get up slowly if you are lying down. Be sure you know how the drugs affect you before you drive a car. Don’t stop taking the drugs suddenly—your blood pressure could rise very quickly, or you might feel anxious.

Vasodilators

Vasodilators relax muscles in the vessel walls, making the blood vessels wider and causing blood pressure to go down. Vasodilators may be used when other types of blood pressure pills have not worked. Commonly used vasodilators include hydralazine (Apresoline[®], Apresazide[®]) and minoxidil (Loniten[®])—which can also help grow hair!

Like centrally acting agents, these types of blood pressure pills can make you feel dizzy or drowsy, so get up slowly if you are lying down. Be sure you know how the pills affect you before you drive a car. Alcohol can make the dizziness worse. Don’t stop taking the pills suddenly—your blood pressure could rise very quickly, or you might feel anxious.

Now that you’ve seen all the classes of blood pressure pills, which ones do you want to ask your doctor about? Check all that apply:

- Diuretics
- ACE inhibitors
- Angiotensin receptor blockers (ARBs)
- Beta blockers
- Calcium channel blockers (CCBs)
- Alpha blockers
- Centrally acting agents
- Vasodilators



Improving Heart Health

So far in this module, we've talked about lifestyle factors that can *raise* your risk of heart disease. But there are also some lifestyle factors that can help *reduce* your risk of heart disease or lower your blood pressure.

We've already talked about exercise. There are many studies that show that exercise can lower blood pressure and protect the heart. Reducing stress—and even meditating—can also help improve heart health, especially in people of African-American descent.

Stress is everywhere in daily life: jobs, relationships, traffic, bills, doctor visits, health problems, etc. And each time your body is under stress, your body releases stress hormones, like adrenaline and cortisol. These hormones have many effects on the body—including raising your blood pressure and making your heart race.

Can you reduce stress in your life? Maybe! Here are some things you might try. Check the boxes of the ones that look helpful:

- Keep a journal.** Writing about the things that bother me can help me see things more clearly and maybe even find some answers.
- Seek out a support group.** No matter what is upsetting me, I am not alone. Someone, somewhere, is struggling with the same concerns. In my town, or even online, I can find a group to talk with.
- Take up yoga, Tai Chi, Chi Gung, or another form of exercise that helps me relax.**
- De-stress my home.** Get rid of clutter. Throw out or give away things I don't wear or use. I'll feel much better when I have a calm retreat, even just one room.
- Create a calming ritual that I can do every day**—a warm bath with candles, a foot rub, a lavender sachet under my pillow, etc.
- Snuggle with a pet.** Stroking a cat or dog can boost my mood and soothe my spirit, reducing my stress level and blood pressure.
- Take up a needlework hobby.** Knitting, crochet, sewing, needlepoint, or embroidery can help calm my nerves and soothe my spirit (and the results make great handmade gifts!)
- Take an anger management class.** It can help me put daily upsets in perspective.
- Get my finances in order.** If money problems are causing me stress, I will seek out free advice. I'll talk to a renal social worker about my health care costs, find a non-profit service that consolidates debt, or call credit card companies and ask for an extension (and a lower interest rate).
- Play music that calms me.** I'll turn off the TV and find a radio station or CD that makes me feel relaxed. The library offers free music rentals.





- Cook on a weekend for the whole week.**
I'll make two or three dishes that I can mix and match, and reduce dinner-hour stress.
- Let some things go.** I can't always control what happens in my life, but I can control how I choose to respond to it. If my faith is strong, I might choose to "let go, and let God."
- Pay attention to your own thoughts.**
If I catch myself being negative, challenge myself to come up with a positive idea instead.
- Talk to a trained therapist, like a psychologist or social worker, about the things that are worrying me.**
- Turn off the news.**
- Exercise.**
- Other:**

Another way to deal with stress is to learn a way to relax your body and mind. Studies have shown that learning to relax and meditate can help slow the heart, relax the arteries, and reduce blood pressure and heart disease.

Can you find 15 or 20 minutes each day to sit or lie down quietly and focus on your breathing? If possible, it's best to learn how to relax with help from an expert. Find a class in your area or if not, even a video or audiotape that can teach you. If you can't find one of these resources, look for a book or a website to teach you the basics. Give it a try! You've got nothing to lose but your stress.

Which of these lifestyle choices do you need to work on? Choose just one for now:

- Limiting daily salt intake
- Losing weight

- Eating a healthier diet
- Taking blood pressure medicines the right way
- Getting regular exercise
- Quitting smoking
- Controlling blood sugar
- Reducing stress in my life
- Staying within my fluid limits, if I'm on dialysis
- Other: _____

The hardest part of making a lifestyle change is getting started. And a great starting point is to make a goal.

Write one concrete, measurable goal that you could pursue over the next week toward the lifestyle change you chose:

Example: Lifestyle change is "Getting regular exercise." Goal is "I will start walking for 20 minutes a day, five times a week, starting tomorrow."

We're ready to wrap up this module on staying heart healthy. But before we do, we offer a final word.

Kidney disease brings you many challenges. But you never have to be just a passive onlooker. It is *your* health and quality of life that are at stake! So, learn as much as you can and then act on it. Whether it's blood pressure and fluids or some other part of life, this approach will help you to live well with kidney disease.

It's time to look at your Personal Plan. Read it and use it to remind you of how you want to manage your blood pressure and heart health.



Personal Plan for _____

Heart Health and Blood Pressure

Blood pressure – The force at which blood pushes against the walls of my blood vessels. My blood pressure can be high, even if I can't feel it. The only way to know my blood pressure for sure is to check it with a blood pressure monitor. Below is a chart to help me keep track of my blood pressure checks.

Normal blood pressure with CKD – 125/75 or lower

Blood pressure on dialysis – 140/90 before a treatment; 130/80 after.

High blood pressure – Greater than 140/90. Can cause a stroke, heart attack, or kidney failure, and usually has no warning signs. That's why it is called the "silent killer."

Diabetes and high blood pressure together are a "double whammy" that is extra hard on my body. I should be tested every year for diabetes if I:

- Have a family history of diabetes
- Have a BMI greater than 25
- Have an "apple" shape, with body fat around my middle.
- Am over 65 years of age

One way for me to tell if my weight is about right for my height is called the Body Mass Index (BMI). I can find my BMI online at www.nhlbisupport.com/bmi/, or I can ask my doctor.

My Blood Pressure (BP) Chart

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____
Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____
Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____
Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____
Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____	Time: _____ BP: _____





Personal Plan for _____ (continued)

My waist-to-hip ratio is (see page 13-7 for directions on figuring out this value): _____

Goal: _____

Here are some things I can do to control my blood pressure and help keep my heart healthy:

- Eat a healthy renal diet and maintain a healthy weight.
- Get regular exercise.
- Take my blood pressure medication as prescribed.
- If I smoke, quit.
- Drink alcohol in moderation.
- Ask my doctor about my homocysteine and calcium levels.
- If I'm on dialysis, know what my "dry" weight should be and work to keep it there.

I am on dialysis, and I want to talk to my care team about whether I am gaining too much fluid. Here are some ways I would like to try to gain less fluid weight: _____

Stress is everywhere in daily life. These are the lifestyle changes I want to work on to manage my stress and reduce my blood pressure:

My blood pressure medications can only work if I take them the right way. Here are some tips to help me take my blood pressure pills so they will work best for me:

This is the one change I want to start with, along with my goal for the next week to get me started:

Lifestyle change: _____



Personal Plan for _____ (continued)

Below is a chart of common blood pressure drugs and their side effects/cautions.

I will ask my doctor about the ones I may be interested in.

Blood Pressure Medications

Class	How they work	Examples	Side effects	Cautions
Diuretics (“water pills”)	Keep kidneys from reabsorbing salt. Cause more urine to be made.	<ul style="list-style-type: none"> • furosemide (Lasix[®]) • chlorothiazide (Diuril[®]) • hydrochlorothiazide (Hydro-D[®]) • hydroflumethiazide (Saluron[®]) • methyclothiazide (Enduron[®]) • indapamide (Lozol[®]) • spironolactone (Aldactone[®]) 	<ul style="list-style-type: none"> • Reduced hearing • Ears ringing • Dangerous loss of: <ul style="list-style-type: none"> - Potassium - Sodium - Calcium - Magnesium 	<ul style="list-style-type: none"> • If blood pressure drops too low, severe loss of body water can damage the kidneys • Some diuretics may contain sulfa
ACE inhibitors	Relax the arteries	<ul style="list-style-type: none"> • benazepril (Lotensin[®]) • captopril (Capoten[®]) • enalapril (Vasotec[®]) • fosinopril (Monopril[®]) • lisinopril (Prinivil[®], Zestril[®]) • quinapril (Accupril[®]) • ramipril (Altace[®]) 	<ul style="list-style-type: none"> • Dry cough • High potassium • Rapid pulse • Swelling: face, feet, mouth, hands • Headache • Drowsiness or weakness • Stomach upset • Joint pain • Chest pain 	<ul style="list-style-type: none"> • Allergy: trouble breathing, rash, fainting, swelling • Can worsen high blood pressure caused by narrowing of the renal arteries • Taking over-the-counter pain pills can damage kidneys
Angiotensin receptor blockers (ARBs)	Relax the arteries	<ul style="list-style-type: none"> • candesartan (Atacand[®]) • eprosartan (Tevetem[®]) • irbesartan (Avapro[®]) • losartan (Cozaar[®]) • valsartan (Diovan[®]) 	<ul style="list-style-type: none"> • Upset stomach • Muscle cramps • Dizziness • Headaches • Fatigue 	



Personal Plan for _____ (continued)

Blood Pressure Medications

Class	How they work	Examples	Side effects	Cautions
Beta blockers	Block the effects of adrenaline, slowing the heart rate, and making the pulse less forceful	<ul style="list-style-type: none"> • acebutolol (Sectral®) • atenolol (Tenormin®) • betaxolol (Kerlone®) • bisoprolol (Zebeta®) • carteolol (Cartrol®) • metoprolol (Lopressor®) • nadolol (Corgard®) • penbutolol (Levitol®) • pindolol (Visken®) • propranolol (Inderal®) • timolol (Blocadren®) 	<ul style="list-style-type: none"> • Dizziness/weakness • Drowsiness/fatigue • Cold hands and feet • Dry mouth, eyes, and skin • Slow heart rate • Headache or ringing in the ears • Shortness of breath • Fainting • Erectile dysfunction and loss of sex drive in men and women 	<ul style="list-style-type: none"> • May raise blood sugar or reduce symptoms of low blood sugar • May worsen lung problems/asthma • May worsen food or dye allergies • May not work as well with: <ul style="list-style-type: none"> - Caffeine - Cough/cold remedies - Antihistamines - Alcohol - Aluminum antacids or phosphate binders
Calcium channel blockers (CCBs)	Keep calcium from entering the muscle cells of the heart, slowing the heart rate and relaxing the arteries.	<ul style="list-style-type: none"> • amlodipine (Norvasc®) • diltiazem (Cardizem®) • felodipine (Plendil®) • isradipine (DynaCirc®) • nifedipine (Procardia®) • Verapamil (Covera-HS®, Calan®, Verelan®, Isoptin®) 	<ul style="list-style-type: none"> • Headache • Lower leg swelling • Fatigue or weakness • Upset stomach • Low blood pressure • Slow or fast pulse • Sore/bleeding gums • Shortness of breath • Skin rash or hair loss • Fainting 	<ul style="list-style-type: none"> • Avoid alcohol • Grapefruit juice can cause CCBs to build up to toxic levels in your body (but eating a grapefruit is okay) • Congestive heart failure, depression, or Parkinson's disease may worsen



Personal Plan for _____ (continued)

Blood Pressure Medications

Class	How they work	Examples	Side effects	Cautions
Alpha blockers	Block the effects of stress hormones on the heart and blood vessels	<ul style="list-style-type: none"> • doxazosin (Cardura®) • prazosin (Minipress®) • tamsulosin (Flomax®) • terazosin (Hytrin®) 	<ul style="list-style-type: none"> • Low blood pressure • Lower leg swelling • Chest pain, wheezing • Weight gain • Upset stomach • Anxiety • Poor bladder control • Painful, continuous erection or impotence • Back or joint pain • Blurred vision • Runny or stuffy nose 	
Centrally acting agents	Relax small arteries	<ul style="list-style-type: none"> • clonidine (Catapres®) • methyldopa (Aldomet®) 	<ul style="list-style-type: none"> • Dry mouth • Dizziness • Drowsiness • Constipation • Headaches 	<ul style="list-style-type: none"> • Don't stop taking it suddenly—can cause severe high blood pressure
Vasodilator	Relax blood vessel walls	<ul style="list-style-type: none"> • hydralazine (Apresoline®, Apresazide®) • minoxidil (Loniten®) 	<ul style="list-style-type: none"> • Dizziness • Drowsiness • Headaches • Nausea, vomiting, diarrhea • Palpitations • Rapid heart rate • Angina pains • Darker, thicker body hair (minoxidil) 	<ul style="list-style-type: none"> • Don't stop taking it suddenly—can cause severe high blood pressure • Alcohol can make dizziness worse



Take the Kidney Quiz!

You'll see how much you're learning if you take our quick kidney quiz. It's just 10 questions. How about it? *(Answers are on page 13-2.)*

- 1. Blood pressure is the force of blood pushing against your:**
 - a) Blood vessel walls
 - b) Muscles
 - c) Heart
 - d) Lungs
- 2. Another word for high blood pressure is:**
 - a) Hyperactive
 - b) Hypertension
 - c) Hyperextension
 - d) Hyperglycemia
- 3. High blood pressure is a major cause of all of the following EXCEPT:**
 - a) Kidney disease
 - b) Stroke
 - c) Asthma
 - d) Heart failure
- 4. How low should you keep your blood pressure if you have kidney disease?**
 - a) 140/90
 - b) 210/108
 - c) 110/60
 - d) 125/75
- 5. Heart failure means:**
 - a) The heart is weakened and does not pump blood well
 - b) The heart shrinks to half its normal size
 - c) The heart stops and you die on the spot
 - d) The heart pumps blood backwards
- 6. Numbness, trouble seeing, loss of balance, and severe headache could be signs of:**
 - a) Pneumonia
 - b) A stroke
 - c) A heart attack
 - d) Heart failure
- 7. Chest or jaw pain, trouble breathing, a cold sweat, and nausea could be signs of:**
 - a) Pneumonia
 - b) A stroke
 - c) A heart attack
 - d) Heart failure
- 8. Carrying extra weight here raises the risk of type 2 diabetes and heart disease:**
 - a) Legs and thighs
 - b) Belly
 - c) Upper arms
 - d) Hips
- 9. Which of the following diet changes helps lower blood pressure?**
 - a) Eating less phosphorus
 - b) Eating less calcium
 - c) Eating less salt
 - d) Eating less fruits and vegetables
- 10. All of these habits can help you stay heart healthy EXCEPT:**
 - a) Get regular exercise
 - b) Quit smoking
 - c) Eat a healthy diet and maintain a healthy weight
 - d) Take your blood pressure pills when you feel your blood pressure rise



Additional Resources

In addition to the free Life Options materials you can find at www.lifeoptions.org, the resources below may help you learn more about the topics in this module of Kidney School.

PLEASE NOTE: Life Options does not endorse these materials. Rather, we believe you are the best person to choose what will meet your needs from these or other resources you find. Please check with your local library, bookstore, or the internet to find these items.

Books:

- 1 ***Help, I Need Dialysis!*** by Dori Schatell, MS, and Dr. John Agar
(Medical Education Institute, 2012, http://www.lifeoptions.org/help_book, ISBN-13: 978-1937886004)
Easy to read, fully referenced book covers the lifestyle impact of each type of dialysis—including information on your heart and blood pressure.
- 2 ***The American Medical Association Guide to Preventing and Treating Heart Disease: Essential Information You and Your Family Need to Know about Having a Healthy Heart***, by Martin S. Lipsky, MD; Marla Mendelson, MD; Stephen Havas, MD, MPH; and Michael Miller, MD (Wiley, January 2008, ISBN-13: 978-0471750246)
This book includes information about controlling cholesterol and high blood pressure, medications, exercise, and risk factors for heart disease and ways to deal with them.
- 3 ***Living a Healthy Life with Chronic Conditions: Self-management of Heart Disease, Arthritis, Diabetes, Depression, Asthma, Bronchitis, Emphysema, & Other Physical and Mental Health Conditions***, by Kate Lorig, RN, DrPh; Halsted Holman, MD; David Sobel, MD; Diana Laurent, MPH; Virginia Gonzalez, MPH; and Marian Minor, RPT, PhD
(Bull Publishing, June 1, 2012) Based on information gathered at Stanford University, this book covers how to have a good life with a chronic disease.

Other item:

- 1 *High Blood Pressure and Kidney Disease* (fact sheet) by the National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). If you would like more information, please call (800) 891-5390 or visit the NKUDIC website at <http://kidney.niddk.nih.gov/kudiseases/pubs/highblood/index.htm>.

Websites:

For more information about blood pressure and heart health, visit the following websites:

- 1 American Heart Association at www.americanheart.org
- 2 Heart Failure Society of America at www.abouthf.org
- 3 National Heart, Lung, and Blood Institute at www.nhlbi.nih.gov

