

# **HEART FAILURE**

## **About Heart Failure**

The term "heart failure" makes it sound like the heart is no longer working at all and there's nothing that can be done. Actually, heart failure means that the heart isn't pumping as well as it should be.

Your body depends on the heart's pumping action to deliver oxygen- and nutrient-rich blood to the body's cells. When the cells are nourished properly, the body can function normally.

With heart failure, the weakened heart can't supply the cells with enough blood. This results in fatigue and shortness of breath. Everyday activities such as walking, climbing stairs or carrying groceries can become very difficult.

Heart failure is a serious condition, and usually there's no cure. But many people with heart failure lead a full, enjoyable life when the condition is managed with heart failure medications and healthy lifestyle changes. It's also helpful to have the support of family and friends who understand your condition.

## **How the normal heart works**

The normal healthy heart is a strong, muscular pump a little larger than a fist. It pumps blood continuously through the circulatory system.

The heart has four chambers, two on the right and two on the left:

- Two upper chambers called atria (one is an atrium)
- Two lower chambers called ventricles

Oxygen-rich blood travels from the lungs to the left atrium, then on to the left ventricle, which pumps it to the rest of the body.

The right atria takes in oxygen-depleted blood from the rest of the body and sends it back out to the lungs through the right ventricle.

The heart pumps blood to the lungs and to all the body's tissues by a sequence of highly organized contractions of the four chambers. For the heart to function properly, the four chambers must beat in an organized way.

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## **What is heart failure?**

Heart failure is a chronic, progressive condition in which the heart muscle is unable to pump enough blood through to meet the body's needs for blood and oxygen. Basically, the heart can't keep up with its workload.

At first the heart tries to make up for this by:

- Enlarging. When the heart chamber enlarges, it stretches more and can contract more strongly, so it pumps more blood.
- Developing more muscle mass. The increase in muscle mass occurs because the contracting cells of the heart get bigger. This lets the heart pump more strongly, at least initially.
- Pumping faster. This helps to increase the heart's output.

The body also tries to compensate in other ways:

- The blood vessels narrow to keep blood pressure up, trying to make up for the heart's loss of power.
- The body diverts blood away from less important tissues and organs to maintain flow to the most vital organs, the heart and brain.

These temporary measures mask the problem of heart failure, but they don't solve it. Heart failure continues and worsens until these substitute processes no longer work.

Eventually the heart and body just can't keep up, and the person experiences the fatigue, breathing problems or other symptoms that usually prompt a trip to the doctor.

The body's compensation mechanisms help explain why some people may not become aware of their condition until years after their heart begins its decline. (It's also a good reason to have a regular checkup with your doctor.)

Heart failure can involve the heart's left side, right side or both sides. However, it usually affects the left side first.

## **Types of Heart Failure**

### *Left-sided heart failure*

The heart's pumping action moves oxygen-rich blood as it travels from the lungs to the left atrium, then on to the left ventricle, which pumps it to the rest of the body. The left ventricle supplies most of the heart's pumping power, so it's larger than the other chambers and essential for normal function. In left-sided or left ventricular (LV) heart failure, the left side of the heart must work harder to pump the same amount of blood.

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There are two types of left-sided heart failure. Drug treatments are different for the two types.

- **Systolic failure:** The left ventricle loses its ability to contract normally. The heart can't pump with enough force to push enough blood into circulation.
- **Diastolic failure (also called diastolic dysfunction):** The left ventricle loses its ability to relax normally (because the muscle has become stiff). The heart can't properly fill with blood during the resting period between each beat.

### *Right-sided heart failure*

The heart's pumping action moves "used" blood that returns to the heart through the veins through the right atrium into the right ventricle. The right ventricle then pumps the blood back out of the heart into the lungs to be replenished with oxygen.

Right-sided or right ventricular (RV) heart failure usually occurs as a result of left-sided failure. When the left ventricle fails, increased fluid pressure is, in effect, transferred back through the lungs, ultimately damaging the heart's right side. When the right side loses pumping power, blood backs up in the body's veins. This usually causes swelling in the legs and ankles.

### *Congestive heart failure*

Congestive heart failure is a type of heart failure which requires seeking timely medical attention, although sometimes the two terms are used interchangeably.

As blood flow out of the heart slows, blood returning to the heart through the veins backs up, causing congestion in the body's tissues. Often swelling (edema) results. Most often there's swelling in the legs and ankles, but it can happen in other parts of the body, too.

Sometimes fluid collects in the lungs and interferes with breathing, causing shortness of breath, especially when a person is lying down. This is called pulmonary edema and if left untreated can cause respiratory distress.

Heart failure also affects the kidneys' ability to dispose of sodium and water. This retained water also increases swelling in the body's tissues (edema).

### **Classes of Heart Failure**

Doctors usually classify patients' heart failure according to the severity of their symptoms. The table below describes the most commonly used classification system, the New York Heart Association (NYHA) Functional Classification. It places patients in one of four categories based on how much they are limited during physical activity.

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### **Class Functional Capacity: How a patient with cardiac disease feels during physical activity**

I Patients with cardiac disease but resulting in no limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, shortness of breath or chest pain.

II Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, shortness of breath or chest pain.

III Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, shortness of breath or chest pain.

IV Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the chest syndrome may be present even at rest. If any physical activity is undertaken, discomfort increases.

### **Class Objective Assessment**

A No objective evidence of cardiovascular disease. No symptoms and no limitation in ordinary physical activity.

B Objective evidence of minimal cardiovascular disease. Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.

C Objective evidence of moderately severe cardiovascular disease. Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest.

D Objective evidence of severe cardiovascular disease. Severe limitations. Experiences symptoms even while at rest.

### **Warning Signs of Heart Failure**

| <b>Sign or Symptom</b>                    | <b>People with Heart Failure May Experience...</b>  | <b>Why It Happens</b>   |
|---|---|---|
| Shortness of breath (also called dyspnea) | ...breathlessness during activity (most commonly), at rest, or while sleeping, which may come on suddenly and | Blood "backs up" in the pulmonary veins (the vessels that return blood from |

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wake you up. You often have difficulty breathing while lying flat and may need to prop up the upper body and head on two pillows. You often complain of waking up tired or feeling anxious and restless.

the lungs to the heart) because the heart can't keep up with the supply. This causes fluid to leak into the lungs.

Persistent coughing or wheezing

...coughing that produces white or pink blood-tinged mucus.

Fluid builds up in the lungs (see above).

Buildup of excess fluid in body tissues (edema)

...swelling in the feet, ankles, legs or abdomen or weight gain. You may find that your shoes feel tight.

As blood flow out of the heart slows, blood returning to the heart through the veins backs up, causing fluid to build up in the tissues. The kidneys are less able to dispose of sodium and water, also causing fluid retention in the tissues.

Tiredness, fatigue

...a tired feeling all the time and difficulty with everyday activities, such as shopping, climbing stairs, carrying groceries or walking.

The heart can't pump enough blood to meet the needs of body tissues. The body diverts blood away from less vital organs, particularly muscles in the limbs, and sends it to the heart and brain.

Lack of appetite, nausea

...a feeling of being full or sick to your stomach.

The digestive system receives less blood, causing problems with

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|                              |   |  |
|------------------------------|---|--|
|                              |   | digestion.   |
| Confusion, impaired thinking | ...memory loss and feelings of disorientation. A caregiver or relative may notice this first. | Changing levels of certain substances in the blood, such as sodium, can cause confusion. |
| Increased heart rate         | ...heart palpitations, which feel like your heart is racing or throbbing.                     | To "make up for" the loss in pumping capacity, the heart beats faster.                   |

### Conditions That May Lead to Heart Failure

If you have heart failure, chances are you have (or had) one or more of the conditions listed below ([View an animation of heart failure](#)). Some of these can be present without you knowing it. Typically these conditions cause the "wear and tear" that leads to heart failure. Having more than one of these factors dramatically increases your risk.

Conditions that may lead to heart failure include:

1. Coronary Artery Disease
2. Past heart attack (myocardial infarction)
3. High blood pressure
4. Abnormal heart valves
5. Heart muscle disease (dilated cardiomyopathy, hypertrophic cardiomyopathy) or inflammation (myocarditis)
6. Severe lung disease
7. Diabetes
8. Sleep Apnea
9. Heart defects present at birth

### Treatment of Heart Failure

#### *Medical Therapy*

- Taking your medicines as directed may decrease your symptoms, and prevent your heart failure from getting worse. Keep a written list of the medicines you take, the amounts, and when and why you take them. Put your medicines in a pillbox placed in an area you can easily see. Use a timer to help you remember when to take your medicine. Bring a list of your medicines, or the pill bottles, when you see your caregivers. Ask your caregiver for information about your medicine.

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**Do not** use any medicines, over-the-counter drugs, vitamins, herbs, or food supplements without first talking to caregivers.

- **Do not** stop taking your medicines without talking to your caregiver. Ask your caregiver what to do if you miss taking a dose of your medicine. Call your caregiver if you think your medicines are not helping, or if you feel you are having side effects. Use all of your medicines given to control other health conditions as directed by your caregiver. These conditions include diabetes and high blood cholesterol. If you are taking medicine that makes you drowsy, do not drive or use heavy equipment.
- **Heart medicines:** The following heart medicines may be used to treat your heart failure:
  - **ACE inhibitors:** ACE inhibitors improve the function of your heart. This medicine is given to decrease your symptoms and slow your heart failure. (Example Altace, Lisinopril, Zestril)
    - **Angiotensin II receptor blockers:** You may need angiotensin II receptor blockers (ARBs) if you cannot take ACE inhibitors. ARBs help your heart beat stronger to decrease your symptoms. (Examples: Atacand, Avapro, Benicar, Diovan)
  - **Aldosterone antagonists:** Aldosterone antagonists block the hormone (body chemical) called aldosterone. The medicine helps remove extra fluid from your body and protect your heart from further damage. (Examples: Inspra, Aldactone)
  - **Beta blockers:** Beta blockers help your heart pump strong and regular. (Examples: Coreg, Metoprolol, Toprol, Bystolic)
  - **Cardiac glycosides:** Cardiac glycoside medicine helps your heart beat strongly and decreases abnormal heartbeats. (Example: Digoxin)
  - **Nitrates:** Nitrates help improve the blood flow through your heart. (Examples: IMDUR, Isosorbide, Nitrospray)
  - **Vasodilators:** Vasodilators may improve blood flow by making the blood vessels in your heart and lungs wider. (Example Hydralazine)
- **Aspirin:** You may need to take an aspirin a day to help prevent heart problems. Aspirin helps to prevent blood clots from forming and causing blood flow problems in the heart. If caregivers want you to take aspirin daily, **do not** take acetaminophen or ibuprofen instead. Do not take more or less aspirin than caregivers say to take. If you are on other blood thinner medicine, ask your caregiver before you take aspirin for any reason.
- **Diuretics:** Diuretics help your body get rid of edema (extra fluid) in your lungs and around your heart. This medicine will also help get rid of extra fluid in your legs and ankles. You may urinate more often when taking diuretics. (Examples: Lasix/furosemide, Bumex/bumetanide, Demadex/torsemide)

### *Alcohol Consumption*

- You will need to limit the alcohol you drink, or avoid alcohol completely. Drinking too much alcohol can damage your brain, heart, and liver. Drinking too much alcohol can worsen your heart

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failure and increase your blood pressure. Women should limit alcohol to one drink a day. Men should limit alcohol to two drinks a day. A drink of alcohol is 12 ounces of beer, or five ounces of wine. One and one-half ounces of liquor, such as whiskey, is one drink of alcohol.

- **Do not** drink any alcohol if you have had problems with drinking too much alcohol in the past. You also need to avoid alcohol if you have an alcohol related heart, liver, or other health problem. If you drink alcohol, talk to your caregiver.

*Cardiac rehabilitation:* Cardiac rehabilitation (rehab) is a program that can help you feel better when you have heart failure. Cardiac rehab may decrease your risk of worsening heart failure. During cardiac rehab, you learn how to live a more heart-healthy lifestyle. You may also learn how to exercise safely to strengthen your muscles and heart.

*Daily weight:* Weigh yourself at the same time every morning. It is best to weigh yourself on the same scale, before eating, and after urinating. Try to wear the same type of clothing every time you weigh yourself. Record your weights, and the time you weighed yourself in a diary. Bring your diary to your follow-up visits with your caregiver. Weight gain can be a sign of extra fluid in your body.

*Diet:* You may need to limit the amount of sodium (salt) you eat to 2 to 3 grams each day. Check labels when shopping for food to find low sodium or no salt added foods. Some low sodium foods use potassium salts for flavor. Too much potassium can also cause health problems. Talk with your caregiver about what amount of sodium and potassium salt is okay for you.

*Drug use:* Do not take any illegal street drugs, such as cocaine. Street drugs can make your heart failure symptoms worse. Talk to your caregiver if you use illegal drugs and need help to stop.

*Exercise:* Exercise may help decrease your symptoms and improve your heart function. Exercise also helps with weight control and keeps your muscles strong. A walking program or light aerobic exercise, 3 to 5 times each week, may help your heart failure. Always include warm-up and cool-down activity each time you exercise. **Never start an exercise program without talking with your caregiver.** Together you can plan the best exercise program for you. It is best to start slowly and do more as you get stronger. If you feel more tired than usual the day after exercising, you may need to change your program.

*Liquids:* You may need to limit the amount of liquid you drink each day. You may be told to drink only 2 liters (about 8 eight-ounce cups) or less of liquid daily. Follow your caregiver's advice about how much liquid you should drink each day.

What to do if you get thirsty:

1. Drink fluids only when you are thirsty
2. Keep track of how much you drink by writing it down
3. Rinse your mouth with fluid
4. Suck on lemon wedge or ice chips
5. Freeze juice in ice cube tray
6. Use sugar free chewing gum or hard candies
7. Freeze grapes or strawberries
8. Drain liquid from vegetables and canned fruits
9. Don't forget to save some fluid for your medications
10. Humidifying room air may help

*Smoking:* Smoking harms your body in many ways. Smoking can worsen your heart failure and cause other heart disease, lung disease, and cancer. Quitting smoking will improve your health and the health of those around you. Ask your caregiver for more information about how to stop smoking if you are having trouble quitting.

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*Stress:* Heart failure may cause you to have feelings of worry, fear, and sadness. You and those close to you may feel anxious and scared about your future. These feelings are normal. Learn ways to manage stress, such as deep breathing, meditation, and listening to music. You may choose to see a special caregiver to talk about your feelings. Your family and friends may also be a part of these meetings. Talking with a caregiver may help everyone understand your condition and care better.

*Travel and outdoors:* Traveling to altitudes above 1500 meters (4921 feet) may increase your heart failure symptoms and should be avoided. Any outdoor conditions that can lead to shortness of breath should also be avoided. This includes very hot, and humid (moist) air, poor air quality (pollution), and inclement weather (storms).

*Vaccines:* Ask your caregiver if you should get vaccinated against the flu or pneumonia. The best time to get a flu shot is in October or November. Flu shots are good for one year. Pneumonia shots are good for five to six years. Ask your caregiver which vaccinations are right for you.

*Weight control:* Maintain a healthy weight to decrease how hard your heart has to work. If you are overweight (weighing more than your caregiver suggest), ask your caregiver about a weight loss plan. If you have sleep apnea, losing weight may help you breathe better during sleep.

### **Additional Dietary Considerations**

Because of your heart condition, it is very important that you keep track of what you eat and drink. Too much salt or fluid in your diet can stress the heart and lead to worsening of symptoms.

You should not consume more than 2 Liters, or 2000 ml (like the size of a big bottle of soda) of fluid in a day. This includes any form of liquid: including coffee, soup, ice cream, etc.

You should not consume more than 2 grams, or 2000 milligrams of salt (sodium) per day. Examples of foods with a high salt content include: chinese food, pizza, certain cheeses, salad dressings, cold cuts, canned soups, and any food served in a restaurant! See attached handouts regarding the salt content in processed foods and how to read a food label. Remember, if it comes in a box, can, or a bag, it has salt in it!

**Every day** you should weigh yourself at the same time in the morning.

**Every day** you should ask yourself these questions:

1. Did you gain 2 or 3 pounds?
2. Are your feet swollen?
3. Is it hard to breathe when you lie flat on your back?
4. Do you have a new dry or loose cough?
5. Does your belly feel bloated?
6. Is it hard to breathe when you walk or get dressed?
7. Do you have chest pain?
8. Do you wake up in the middle of the night and find it difficult to breathe?

If you answer “yes” to any of these questions (especially if your answer in the recent past has been “no”), please contact your doctor.