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FACTS ABOUT HEART FAILURE

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What is heart failure?

Heart failure occurs when the heart loses its ability to pump enough blood through the body. Usually, the loss in pumping action is a symptom of an underlying heart problem, such as coronary artery disease.

The term heart failure suggests a sudden and complete stop of heart activity. But, actually, the heart does not suddenly stop. Rather, heart failure usually develops slowly, often over years, as the heart gradually loses its pumping ability and works less efficiently. Some people may not become aware of their condition until symptoms appear years after their heart began its decline.

How serious the condition is depends on how much pumping capacity the heart has lost. Nearly everyone loses some pumping capacity as he or she ages. But the loss is significantly more in heart failure and often results from a heart attack or other disease that damages the heart.

The severity of the condition determines the impact it has on a person's life. At one end of the spectrum, the mild form of heart failure may have little effect on a person's life; at the other end, severe heart failure can interfere with even simple activities and prove fatal. Between those extremes, treatment often helps people lead full lives.

But all forms of heart failure, even the mildest, are a serious health problem, which must

be treated. To improve their chance of living longer, patients must take care of themselves, see their physician regularly, and closely follow treatments.

Is there only one type of heart failure?

The term congestive heart failure is often used to describe all patients with heart failure. In reality, congestion (the buildup of fluid) is just one feature of the condition and does not occur in all patients. There are two main categories of heart failure although within each category, symptoms and effects may differ from patient to patient. The two categories are:

Systolic heart failure--This occurs when the heart's ability to contract decreases. The heart cannot pump with enough force to push a sufficient amount of blood into the circulation. Blood coming into the heart from the lungs may back up and cause fluid to leak into the lungs, a condition known as pulmonary congestion.

Diastolic heart failure--This occurs when the heart has a problem relaxing. The heart cannot properly fill with blood because the muscle has become stiff, losing its ability to relax. This form may lead to fluid accumulation, especially in the feet, ankles, and legs. Some patients may have lung congestion.

How common is heart failure?

Between 2 to 3 million Americans have heart failure, and 400,000 new cases are diagnosed each year. The condition is slightly more common among men than women and is twice as common among African Americans as whites.

Heart failure causes 39,000 deaths a year and is a contributing factor in another 225,000 deaths. The death rate attributed to heart failure rose by 64 percent from 1970 to 1990, while the death rate from coronary heart disease dropped by 49 percent during the same period. Heart failure mortality is about twice as high for African Americans as whites for all age groups.

In a sense, heart failure's growing presence as a health problem reflects the Nation's changing population: More people are living longer. People age 65 and older represent the fastest growing segment of the population, and the risk of heart failure increases with age. The condition affects 1 percent of people age 50, but about 5 percent of people age 75.

What causes heart failure?

As stated, the heart loses some of its blood-pumping ability as a natural consequence of aging. However, a number of other factors can lead to a potentially life-threatening loss of pumping activity.

As a symptom of underlying heart disease, heart failure is closely associated with the major risk factors for coronary heart disease: smoking, high cholesterol levels, hypertension (persistent high blood pressure), diabetes and abnormal blood sugar levels, and obesity. A person can change or eliminate those risk factors and thus lower their risk of developing or aggravating their heart disease and heart failure.

Among prominent risk factors, hypertension (high blood pressure) and diabetes are

particularly important. Uncontrolled high blood pressure increases the risk of heart failure by 200 percent, compared with those who do not have hypertension. Moreover, the degree of risk appears directly related to the severity of the high blood pressure.

Persons with diabetes have about a two- to eightfold greater risk of heart failure than those without diabetes. Women with diabetes have a greater risk of heart failure than men with diabetes. Part of the risk comes from diabetes' association with other heart failure risk factors, such as high blood pressure, obesity, and high cholesterol levels. However, the disease process in diabetes also damages the heart muscle.

The presence of coronary disease is among the greatest risks for heart failure. Muscle damage and scarring caused by a heart attack greatly increase the risk of heart failure. Cardiac arrhythmias, or irregular heartbeats, also raise heart failure risk. Any disorder that causes abnormal swelling or thickening of the heart sets the stage for heart failure.

In some people, heart failure arises from problems with heart valves, the flap-like structures that help regulate blood flow through the heart. Infections in the heart are another source of increased risk for heart failure.

A single risk factor may be sufficient to cause heart failure, but a combination of factors dramatically increases the risk. Advanced age adds to the potential impact of any heart failure risk.

Finally, genetic abnormalities contribute to the risk for certain types of heart disease, which in turn may lead to heart failure. However, in most instances, a specific genetic link to heart failure has not been identified.

What are the symptoms?

A number of symptoms are associated with heart failure, but none is specific for the condition. Perhaps the best known symptom is shortness of breath ("dyspnea"). In heart failure, this may result from excess fluid in the lungs. The breathing difficulties may occur at rest or during exercise. In some cases, congestion may be severe enough to prevent or interrupt sleep.

Fatigue or easy tiring is another common symptom. As the heart's pumping capacity decreases, muscles and other tissues receive less oxygen and nutrition, which are carried in the blood. Without proper "fuel," the body cannot perform as much work, which translates into fatigue.

Fluid accumulation, or edema, may cause swelling of the feet, ankles, legs, and occasionally, the abdomen. Excess fluid retained by the body may result in weight gain, which sometimes occurs fairly quickly.

Persistent coughing is another common sign, especially coughing that regularly produces mucus or pink, blood-tinged sputum. Some people develop raspy breathing or wheezing.

Because heart failure usually develops slowly, the symptoms may not appear until the condition has progressed over years. The heart hides the underlying problem by making

adjustments that delay--but do not prevent--the eventual loss in pumping capacity. The heart adjusts, or compensates, in three ways to cope with and hide the effects of heart failure:

- **Enlargement** ("dilatation"), which allows more blood into the heart;
 - **Thickening of muscle fibers** ("hypertrophy") to strengthen the heart muscle, which allows the heart to contract more forcefully and pump more blood; and
 - **More frequent contraction**, which increases circulation.
- By making these adjustments, or compensating, the heart can temporarily make up for losses in pumping ability, sometimes for years. However, compensation has its limits. Eventually, the heart cannot offset the lost ability to pump blood, and the signs of heart failure appear.

How do doctors diagnose heart failure?

In many cases, physicians diagnose heart failure during a physical examination. Readily identifiable signs are shortness of breath, fatigue, and swollen ankles and feet. The physician also will check for the presence of risk factors, such as hypertension, obesity, and a history of heart problems. Using a stethoscope, the physician can listen to a patient breathe and identify the sounds of lung congestion. The stethoscope also picks up the abnormal heart sounds indicative of heart failure.

If neither the symptoms nor the patient's history point to a clear-cut diagnosis, the physician may recommend any of a variety of laboratory tests, including, initially, an electrocardiogram, which uses recording devices placed on the chest to evaluate the electrical activity of a patient's heartbeat.

Echocardiography is another means of evaluating heart function from outside the body. Sound waves bounced off the heart are recorded and translated into images. The pictures can reveal abnormal heart size, shape, and movement. Echocardiography also can be used to calculate a patient's ejection fraction, a measure of the amount of blood pumped out when the heart contracts.

Another possible test is the chest x ray, which also determines the heart's size and shape, as well as the presence of congestion in the lungs.

Tests help rule out other possible causes of symptoms. The symptoms of heart failure can result when the heart is made to work too hard, instead of from damaged muscle. Conditions that overload the heart occur rarely and include severe anemia and thyrotoxicosis (a disease resulting from an overactive thyroid gland).

What treatments are available?

Heart failure caused by an excessive workload is curable by treating the primary disease, such as anemia or thyrotoxicosis. Also curable are forms caused by anatomical problems, such as a heart valve defect. These defects can be surgically corrected. However, for the common forms of heart failure--those due to damaged heart muscle--no

known cure exists. But treatment for these forms may be quite successful. The treatment seeks to improve patients' quality of life and length of survival through lifestyle change and drug therapy.

Patients can minimize the effects of heart failure by controlling the risk factors for heart disease. Obvious steps include quitting smoking, losing weight if necessary, abstaining from alcohol, and making dietary changes to reduce the amount of salt and fat consumed. Regular, modest exercise is also helpful for many patients, though the amount and intensity should be carefully monitored by a physician.

But, even with lifestyle changes, most heart failure patients must take medication. Many patients receive two or more drugs.

Several types of drugs have proven useful in the treatment of heart failure:

Diuretics help reduce the amount of fluid in the body and are useful for patients with fluid retention and hypertension.

Digitalis increases the force of the heart's contractions, helping to improve circulation.

Results of recent studies have placed more emphasis on the use of drugs known as angiotensin converting enzyme (ACE) inhibitors. Several large studies have indicated that ACE inhibitors improve survival among heart failure patients and may slow, or perhaps even prevent, the loss of heart pumping activity.

Originally developed as a treatment for hypertension, ACE inhibitors help heart failure patients by, among other things, decreasing the pressure inside blood vessels. As a result, the heart does not have to work as hard to pump blood through the vessels. Patients who cannot take ACE inhibitors may get a nitrate and/or a drug called hydralazine, each of which helps relax tension in blood vessels to improve blood flow.

Sometimes, heart failure is life-threatening. Usually, this happens when drug therapy and lifestyle changes fail to control its symptoms. In such cases, a heart transplant may be the only treatment option. However, candidates for transplantation often have to wait months or even years before a suitable donor heart is found. Recent studies indicate that some transplant candidates improve during this waiting period through drug treatment and other therapy, and can be removed from the transplant list.

Transplant candidates who do not improve sometimes need mechanical pumps, which are attached to the heart. Called left ventricular assist devices (LVADs), the machines take over part or virtually all of the heart's blood-pumping activity. However, current LVADs are not permanent solutions for heart failure but are considered bridges to transplantation.

An experimental surgical procedure for severe heart failure is available at a few U.S. medical centers. The procedure, called cardiomyoplasty, involves detaching one end of a muscle in the back, wrapping it around the heart, and then suturing the muscle to the heart. An implanted electric stimulator causes the back muscle to contract, pumping

blood from the heart.

Common Heart Failure Medications

Listed below are some of the medications prescribed for heart failure. Not all medications are suitable for all patients, and more than one drug may be needed.

Also, the list provides the full range of possible side effects for these drugs. Not all patients will develop these side effects. If you suspect that you are having a side effect, alert your physician.

- **ACE Inhibitors.** These prevent the production of a chemical that causes blood vessels to narrow. As a result, blood pressure drops and the heart does not have to work as hard to pump blood.
Side effects may include coughing, skin rashes, fluid retention, excess potassium in the bloodstream, kidney problems, and an altered or lost sense of taste.
- **Digitalis.** Increases the force of the heart's contractions. It also slows certain fast heart rhythms. As a result, the heart beats less frequently but more effectively, and more blood is pumped into the arteries.
Side effects may include nausea, vomiting, loss of appetite, diarrhea, confusion, and new heartbeat irregularities.
- **Diuretics.** These decrease the body's retention of salt and so of water. Diuretics are commonly prescribed to reduce high blood pressure. Diuretics come in many types, with different periods of effectiveness.
Side effects may include loss of too much potassium, weakness, muscle cramps, joint pains, and impotence.
- **Hydralazine.** This drug widens blood vessels, easing blood flow.
Side effects may include headaches, rapid heartbeat, and joint pain.
- **Nitrates.**
These drugs are used mostly for chest pain, but may also help diminish heart failure symptoms. They relax smooth muscle and widen blood vessels. They act to lower primarily systolic blood pressure.
Side effects may include headaches.

Can a person live with heart failure?

Heart failure is one of the most serious symptoms of heart disease. About two-thirds of all patients die within 5 years of diagnosis. However, some live beyond 5 years, even into old age. The outlook for an individual patient depends on the patient's age, severity of heart failure, overall health, and a number of other factors.

As heart failure progresses, the effects can become quite severe, and patients often lose the ability to perform even modest physical activity. Eventually, the heart's reduced pumping capacity may interfere with routine functions, and patients may become unable

to care for themselves. The loss in functional ability can occur quickly if the heart is further weakened by heart attacks or the worsening of other conditions that affect heart failure, such as diabetes and coronary heart disease.

Heart failure patients also have an increased risk of sudden death, or cardiac arrest, caused by an irregular heartbeat.

To improve the chances of surviving with heart failure, patients must take care of themselves.

Patients must:

- See their physician regularly;
- Closely follow all of their physician's instructions;
- Take any medication according to instructions; and
- Immediately inform their physician of any significant change in their condition, such as an intensified shortness of breath or swollen feet.
- Patients with heart failure also should:
 - Control their weight;
 - Watch what they eat;
 - Not smoke cigarettes or use other tobacco products; and
 - Abstain from or strictly limit alcohol consumption.
- Even with the best care, heart failure can worsen, but patients who don't take care of themselves are almost writing themselves a prescription for poor health.
- The best defense against heart failure is the prevention of heart disease. Almost all of the major coronary risk factors can be controlled or eliminated: smoking, high cholesterol, high blood pressure, diabetes, and obesity.

What is the outlook for heart failure?

Within the past decade, knowledge of heart failure has improved dramatically but, clearly, much more remains to be learned. The National Heart, Lung, and Blood Institute (NHLBI) supports numerous research projects aimed at building on what is already known about heart failure and at uncovering new knowledge about its process, diagnosis, and treatment. NHLBI research priorities for heart failure include:

- Learning more about basic cellular changes that lead to heart failure;
- Developing tests to detect the earliest signs of heart failure;
- Identifying factors that cause heart failure to worsen;
- Determining how heart failure can be reversed once it starts;
- Understanding better the heart's ability to compensate for lost pumping ability; and
- Developing new therapies, especially those based on early signs of heart failure.

MAKING THE MOST OF YOUR DOCTOR VISIT

Here are some points you may want to discuss with your doctor. Don't hesitate to ask questions to clarify points. Also, ask your doctor to rephrase a reply you cannot understand. You may want to take a family member or friend to the appointment with you

to help you better understand and remember what's said.

1. Briefly describe your symptoms, even those you feel may not be important. You may want to keep a list so you will remember them.
2. Tell the doctor all of the medications you take--including over-the-counter drugs--and any problems you may be having with them.
3. Be sure you understand all of the doctor's instructions--especially for medications. Know what drug to take when, how often, and in what amount.
4. Find out what side effects are possible from any drug the doctor prescribes for you.
5. Ask the meaning of any medical term you don't understand.

If, after your appointment, you still have questions or are uncertain about your treatment, call the doctor's office to get the information you need.

A QUESTION FOR YOUR PHARMACIST

Your pharmacist is a good resource for information about medications. Ask if any drug you're taking interacts badly with certain foods or with other drugs, including nonprescription ones. Your pharmacist also can help you understand product package inserts and label instructions.

Glossary

Angiotensin converting enzyme (ACE) inhibitor--A drug used to decrease pressure inside blood vessels.

Arrhythmia--An irregular heartbeat.

Cardiomyoplasty--A surgical procedure that involves detaching one end of a back muscle and attaching it to the heart. An electric stimulator causes the muscle to contract to pump blood from the heart.

Congestive heart failure--A heart disease condition that involves loss of pumping ability by the heart, generally accompanied by fluid accumulation in body tissues, especially the lungs.

Diastolic heart failure--Inability of the heart to relax properly and fill with blood as a result of stiffening of the heart muscle.

Dyspnea--Shortness of breath.

Echocardiography--Recording sound waves bounced off the heart to produce images of the heart.

Edema--Abnormal fluid accumulation in body tissues.

Electrocardiogram (EKG or ECG)--Measurement of electrical activity associated with heartbeats.

Heart failure--Loss of blood-pumping ability by the heart.

Left ventricular assist device--A mechanical device used to increase the heart's pumping ability.

Pulmonary congestion (or edema)--Fluid accumulation in the lungs.

Sudden cardiac death--Cardiac arrest caused by an irregular heartbeat.

Systolic heart failure--Inability of the heart to contract with enough force to pump adequate amounts of blood through the body.

Valves--Flap-like structures that control the direction of blood flow through the heart.

Readying A Q & A For Your Doctor Visit

Going to the doctor can be a nervous time. It may be hard to remember everything you want to ask and everything you hear.

It helps to prepare a list of important questions. Use the spaces below to list questions you want answered. Then take this fact sheet with you to your appointment so you can record the answers.

Before you leave the doctor's office, be sure you understand your condition and its treatment, including any medications.

Your Question:

1. _____

Answer:

Your Question:

2. _____

Answer:

Your Question:

3. _____

Answer:

Your Question:

4. _____

Answer:

Your Question:

5. _____

Answer:

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