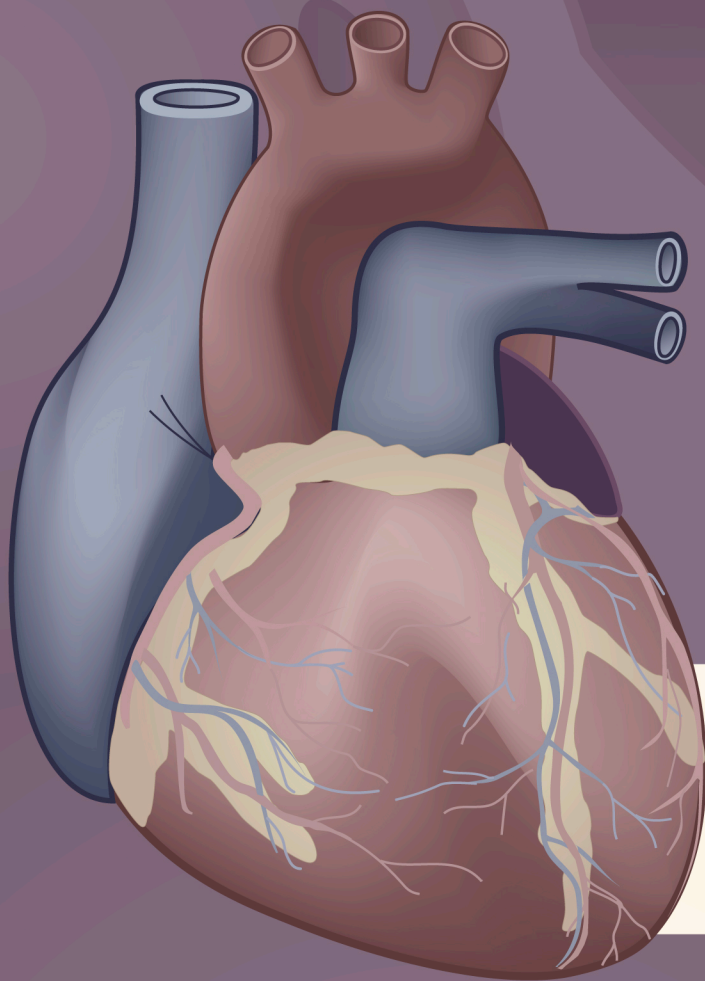


AFTER A HEART ATTACK: Know The Facts.



**A healthy heart,
heart attacks
and heart failure.**



Cardiovascular Cell Therapy Research
Network (CCTRN) www.cctrn.org

STEM CELL CLINICAL RESEARCH

What are Stem Cells?

Stem cells are a type of cell that can become a variety of other types of cells. Under certain conditions, stem cells may become muscle cells, bone cells or cells in other organs of the body.

What do they do?

Stem cells may have the potential to repair damaged tissues, such as damaged heart muscle, and can possibly promote “angiogenesis”—the growth of new blood vessels.

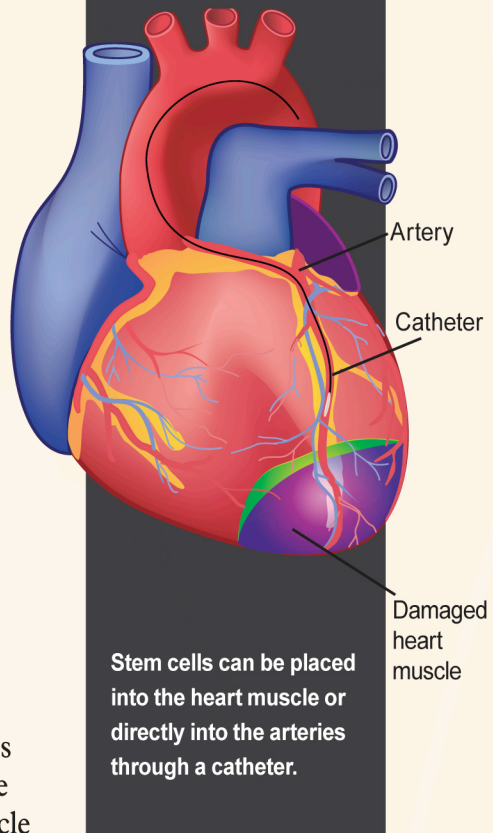
Why after a heart attack?

It is believed by researchers that stem cells which are injected around the border zone of a heart attack near damaged heart muscle may promote healing of the tissues damaged by a heart attack. This may prevent or reduce the likelihood of heart failure or another heart attack.

What is involved in Stem Cell Therapy?

Stem cell therapy involves collecting your own stem cells through a procedure called bone marrow aspiration. The bone marrow is processed in a laboratory to separate out the stem cells. Then, the cells are introduced into the heart through a catheter.

As with many clinical trials, there is a chance of receiving a placebo, which is a solution that contains no stem cells but rather only salts and proteins. It is necessary to give some patients a placebo solution in order to reliably test the effectiveness of the stem cell treatment. Neither the patients nor the doctor or study staff knows who has received a placebo and who has received stem cells. Patients who receive a placebo solution will get the same care for their heart condition as the patients who receive stem cells.



This brochure describes how your heart works and what happens when it is damaged by heart attacks and heart failure.

A HEALTHY HEART

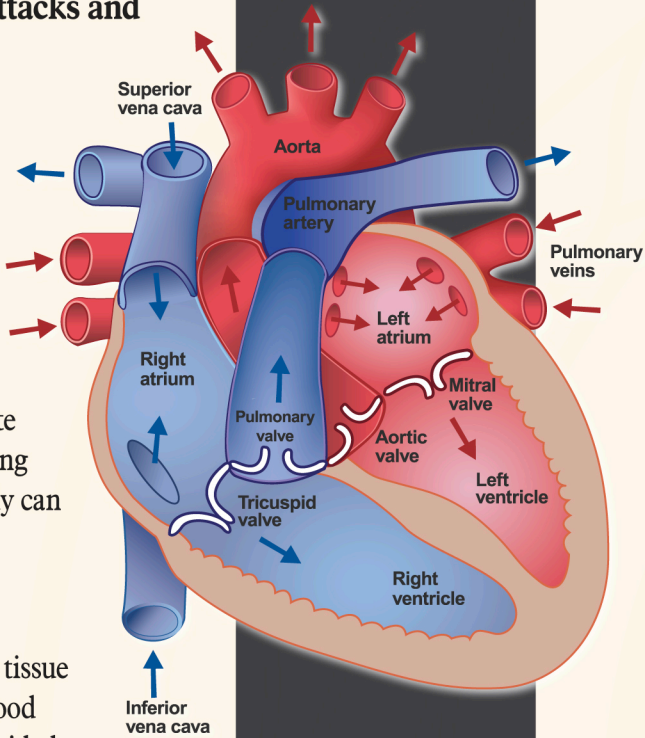
What does your heart do?

Your heart pumps blood to all parts of your body. The circulating blood carries oxygen and nutrients to the tissues and also removes waste products during the circulating process. NO part of your body can survive without oxygen.

How does your heart work?

Your heart is made of muscle tissue that forms four chambers. Blood passes through the two right sided chambers (through the right atrium to the right ventricle) and then it is pumped into the lungs where it becomes rich with oxygen. This oxygen rich blood returns from the lungs and passes into the left side of the heart (left atrium then left ventricle). Finally, the heart pumps the blood out of the left ventricle to travel to all parts of your body.

During this process, the heart also provides oxygen to its own muscle tissue through the main arteries feeding into the heart muscle. This blood flow keeps the heart healthy and functioning properly.



FACT:

Each day an average heart “beats” (expands and contracts) 100,000 times and pumps about 2,000 gallons of blood.*

**Source: National Heart, Lung and Blood Institute*

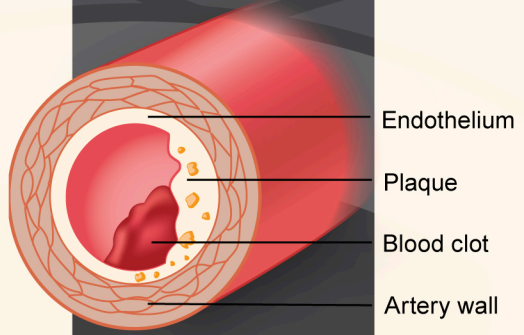
HEART DAMAGE

What is a heart attack?

A heart attack occurs when the blood flow to a part of the heart is blocked (usually by a blood clot). The arteries that supply the heart with blood slowly become thicker and harder from a buildup of fat, cholesterol and other substances sometimes known as plaque.

If the plaque breaks open in an artery and a blood clot forms that blocks the blood flow, a heart attack occurs. The heart muscle supplied by that artery then begins to die. The longer an artery stays blocked the more damage is done to the heart muscle. This results in permanent heart damage. Once heart muscle is damaged or dead, it will not help pump blood—even if your artery has been re-opened with an angioplasty (balloon) and stent (hollow tube).

Over time, the heart will try to compensate for the muscle that is damaged or dead by stretching and becoming an enlarged heart. An enlarged heart cannot keep up your body's demands and will ultimately result in congestive heart failure.



FACT:

In 2008, an estimated 770,000 Americans will have a new heart attack and about 430,000 people will have a recurrent heart attack.*

**Source: American Heart Association, Statistical Update 2008*

Cross-section of a normal heart (left) and a damaged heart (right).

HEART FAILURE

What is heart failure?

When a person's heart is weak, damaged and cannot pump enough blood to meet the body's need for nutrients and oxygen, the person is considered to have heart failure (HF).

Signs and symptoms of HF

- Shortness of breath
- Feeling tired and run down
- Swelling of ankles, feet, legs and stomach
- Weight gain from fluid buildup
- Confused or can't think clearly

REMEMBER: The more damaged the heart muscle, the more severe the heart failure symptoms can become.

Available treatments for HF

- Medications
- Investigational Clinical Research Studies
- Devices: pacemaker/defibrillator
- LVAD (heart pump)
- Heart Transplant
- Artificial Heart

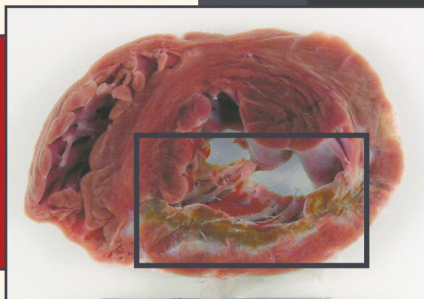
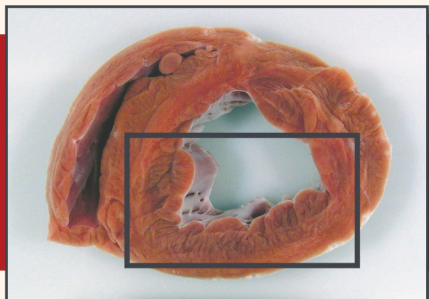
FACT:

4.8 million
Americans
have HF.

FACT:

50% of patients
diagnosed with
HF will not be
alive in 5 years.*

**Source: American Heart
Association, Statistical
Update 2008*



CCTRN Clinical Centers

Cleveland Clinic Lerner
College of Medicine
Cleveland, OH

Texas Heart Institute
Stem Cell Center
Houston, TX

University of Florida
Department of Medicine
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Visit the CCTRN website at
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