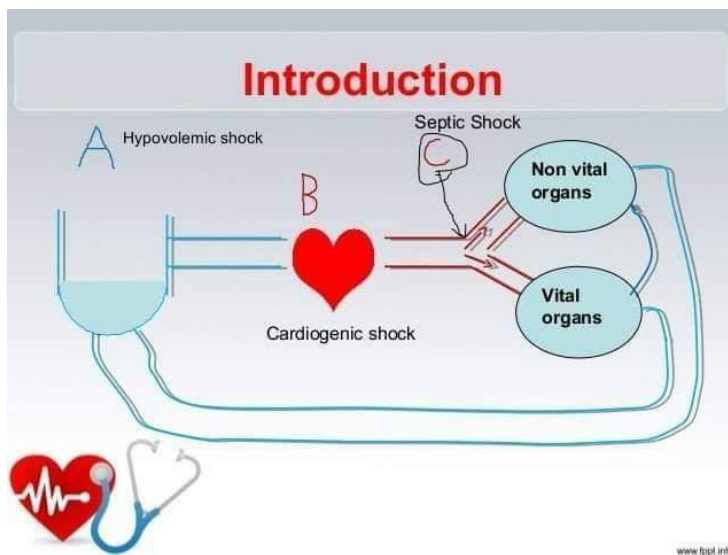


## CARDIOGENIC SHOCK:

Cardiogenic shock is a condition in which your heart suddenly can't pump enough blood to meet your body's needs. The condition is most often caused by a severe heart attack.



Shock is divided into four main types based on the underlying cause: low volume, cardiogenic, obstructive, and distributive shock.

## CAUSES OF CARDIOGENIC SHOCK:

- Cardiogenic shock occurs if the heart suddenly can't pump enough oxygen-rich blood to the body. The most common cause of cardiogenic shock is the damage to the heart muscle from a severe heart attack.
- This damage prevents the heart's main pumping chamber, the left ventricle from working well. As a result, the heart can't pump enough oxygen-rich blood to the rest of the body.
- It is a life-threatening medical condition resulting from an inadequate circulation of blood due to primary failure of the ventricles of the heart to function effectively.
- Also cardiogenic shock is defined by sustained low blood pressure with tissue hyperfunction despite adequate left ventricle filling pressure.

In about 3% of cardiogenic shock cases, the heart's lower right chamber, the right ventricle, doesn't work well. This means the heart can't properly pump blood to the lungs, where it picks up oxygen to bring back to the heart and the rest of the body.

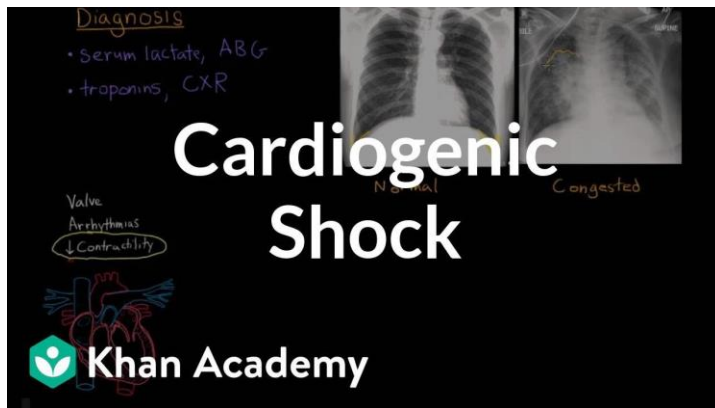
Without enough oxygen-rich blood reaching the body's major organs, many problems can occur. For example: Cardiogenic shock can cause death if the flow of oxygen-rich blood to the organs isn't restored quickly.

If the organs don't get enough oxygen-rich blood, they will not work well. Cells in the organs die, and other organs may never work well again.

### **DIAGNOSIS OF CARIOGENIC SHOCK:**

Cardiogenic shock is usually diagnosed in an emergency setting. Doctors will check for signs and symptoms of shock, and will then perform tests to find the cause. Tests might include:

- **Blood pressure measurement.** People in shock have very low blood pressure.
- **Electrocardiogram (ECG).** This test records the electrical activity of the heart via electrodes attached to the skin. If there is damaged heart muscle, electric problems or fluid buildup around the heart, it won't conduct electrical impulses normally.
- **Chest X-ray.** This allows the doctor to check the size and shape of the heart and its blood vessels and whether there's fluid in the lungs.
- **Blood tests.** Blood drawn to check for organ damage, infection and heart attack. Another type of blood test called arterial blood gas might be used to measure oxygen in the blood.
- **Echocardiogram.** Sound waves produce an image of the heart that can help identify damage from a heart attack.
- **Cardiac catheterization (angiogram).** A liquid dye is injected into the arteries of the heart through a long, thin tube (catheter) that's inserted through an artery, usually in your leg. The dye makes the arteries visible on X-ray, revealing areas of blockage or narrowing.



## TREATMENT OF CARDIOGENIC SHOCK:

Cardiogenic shock treatment focuses on minimizing the damage from lack of oxygen to the heart muscle and other organs.

### Emergency life support

Most people who have cardiogenic shock need extra oxygen. If necessary, the patient will be connected to a breathing machine (ventilator). Patient will receive medications and fluid through an intravenous (IV) line in the arm.

### Medications

Fluids and plasma, given through an IV, and medications to treat cardiogenic shock, work to increase the heart's pumping ability.

- **Inotropic agents.** Patient might be given medications to improve the heart function, such as norepinephrine or dopamine, until other treatments start to work.
- **Aspirin.** Emergency medical workers might give the patient aspirin immediately to reduce blood clotting and keep the blood flowing through a narrowed artery. Patient can take an aspirin him/herself, while waiting for help to arrive only if their doctor has previously told them to do so for symptoms of a heart attack.
- **Thrombolytics.** These drugs, also called clot busters or fibrinolytics, help dissolve a blood clot that's blocking blood flow to the heart. The sooner the patient receives a thrombolytic drug after a heart attack, the greater the chances of survival. Patient will likely receive thrombolytics, such as alteplase or reteplase, only if emergency cardiac catheterization isn't available.

- **Antiplatelet medication.** Emergency room doctors might give the patient drugs similar to aspirin to help prevent new clots from forming. These include medications, such as oral clopidogrel (Plavix), and platelet glycoprotein IIb/IIIa receptor blockers, such as abciximab (Reopro), tirofiban (Aggrastat) and eptifibatide (Integrilin), which are given through a vein (intravenously).
- **Other blood-thinning medications.** Patient will likely be given other medications, such as heparin, to make the blood less likely to form clots. IV or injectable heparin usually is given during the first few days after a heart attack.

## Medical procedures

Medical procedures to treat cardiogenic shock usually focus on restoring blood flow through the heart. They include:

- **Angioplasty and stenting.** If a blockage is found during a cardiac catheterization, the doctor can insert a long, thin tube (catheter) equipped with a special balloon through an artery, usually in the leg, to a blocked artery in the heart. Once in position, the balloon is briefly inflated to open the blockage.  
  
A metal mesh stent might be inserted into the artery to keep it open over time. In most cases, the doctor will place a stent coated with a slow-releasing medication to help keep the artery open.
- **Balloon pump.** The doctor inserts a balloon pump in the main artery off of the heart (aorta). The pump inflates and deflates within the aorta, helping blood flow and taking some of the workload off the heart.
- **Mechanical circulatory support.** Methods newer than the balloon pump are being used to help improve blood flow and supply oxygen to the body, such as extracorporeal membrane oxygenation (ECMO).

## Surgery

If medications and medical procedures don't work to treat cardiogenic shock, the doctor might recommend surgery.

- **Coronary artery bypass surgery.** This involves sewing veins or arteries in place at a site beyond a blocked coronary artery. The doctor might suggest this procedure after the heart has had time to recover from the heart attack. Occasionally, bypass surgery is performed on an emergency basis.

- **Surgery to repair an injury to your heart.** Sometimes an injury, such as a tear in one of the heart's chambers or a damaged heart valve, can cause cardiogenic shock. Surgery might correct the problem.
- **Ventricular assist device.** A mechanical device can be implanted into the abdomen and attached to the heart to help it pump. This might extend and improve the lives of some people with end-stage heart failure who are waiting for new hearts or aren't able to have heart transplantation.

**Heart transplant.** If the heart is so damaged that no other treatments work, a heart transplant may be a last resort.

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