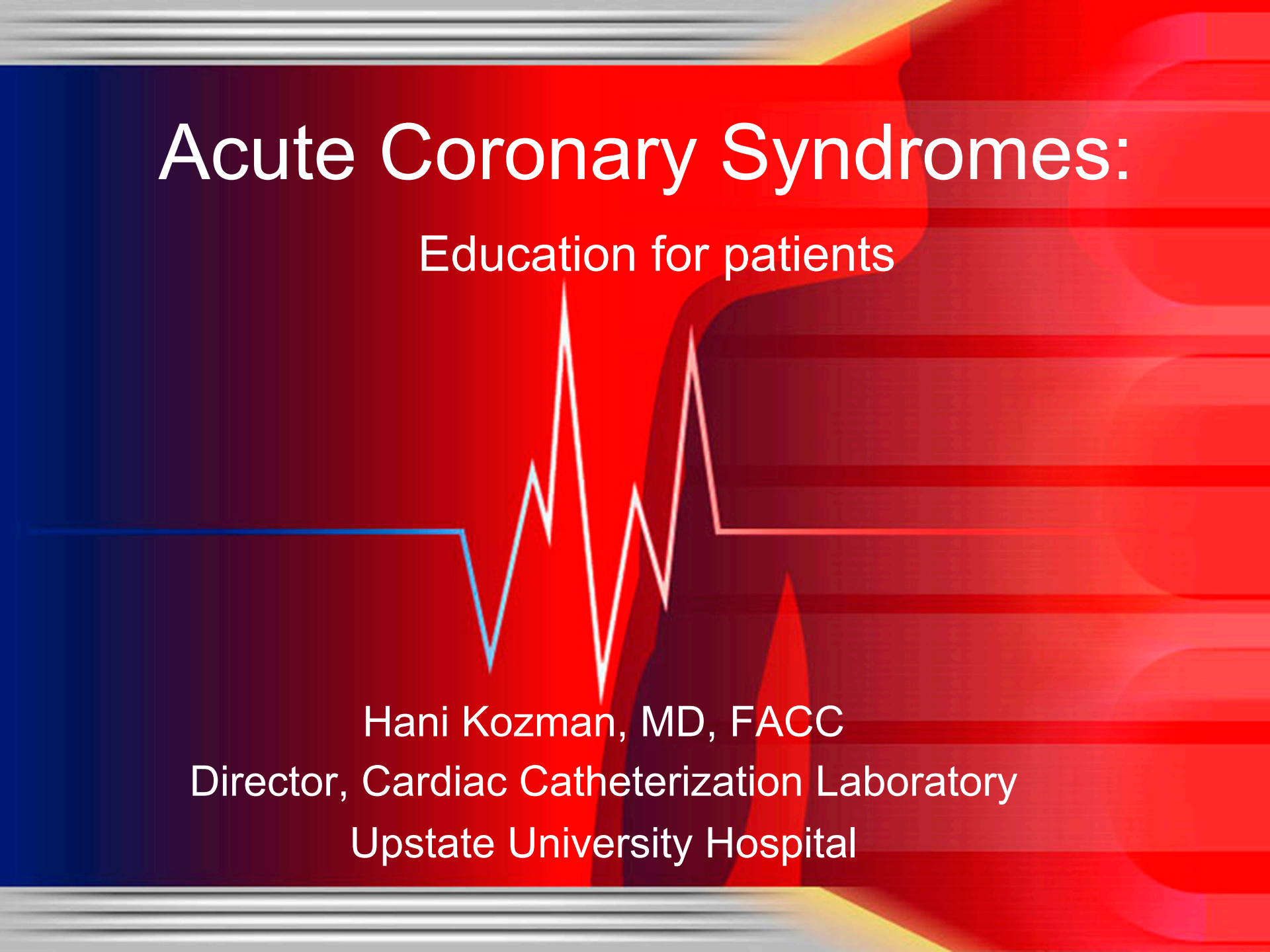
Acute Coronary Syndromes:

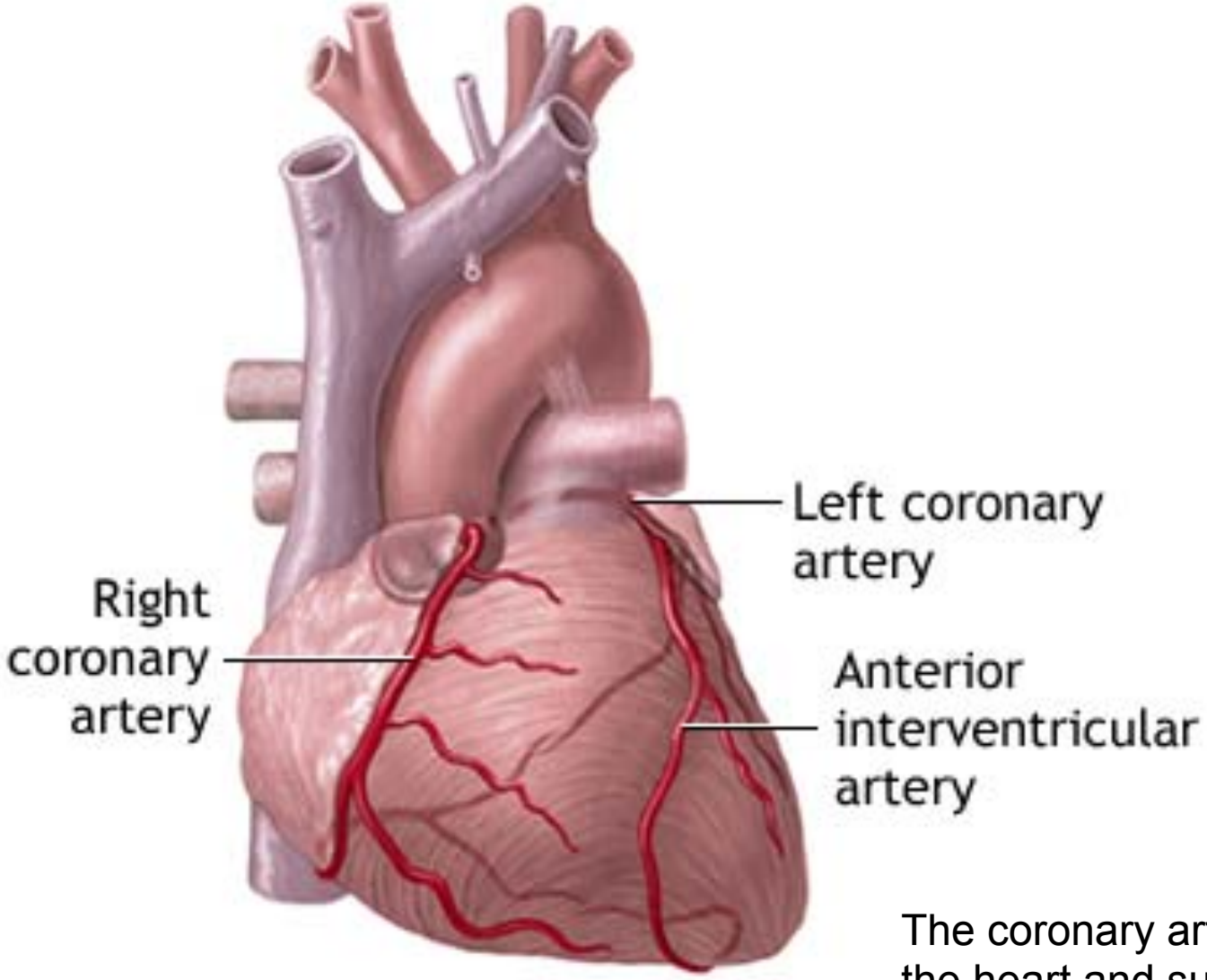
Education for patients



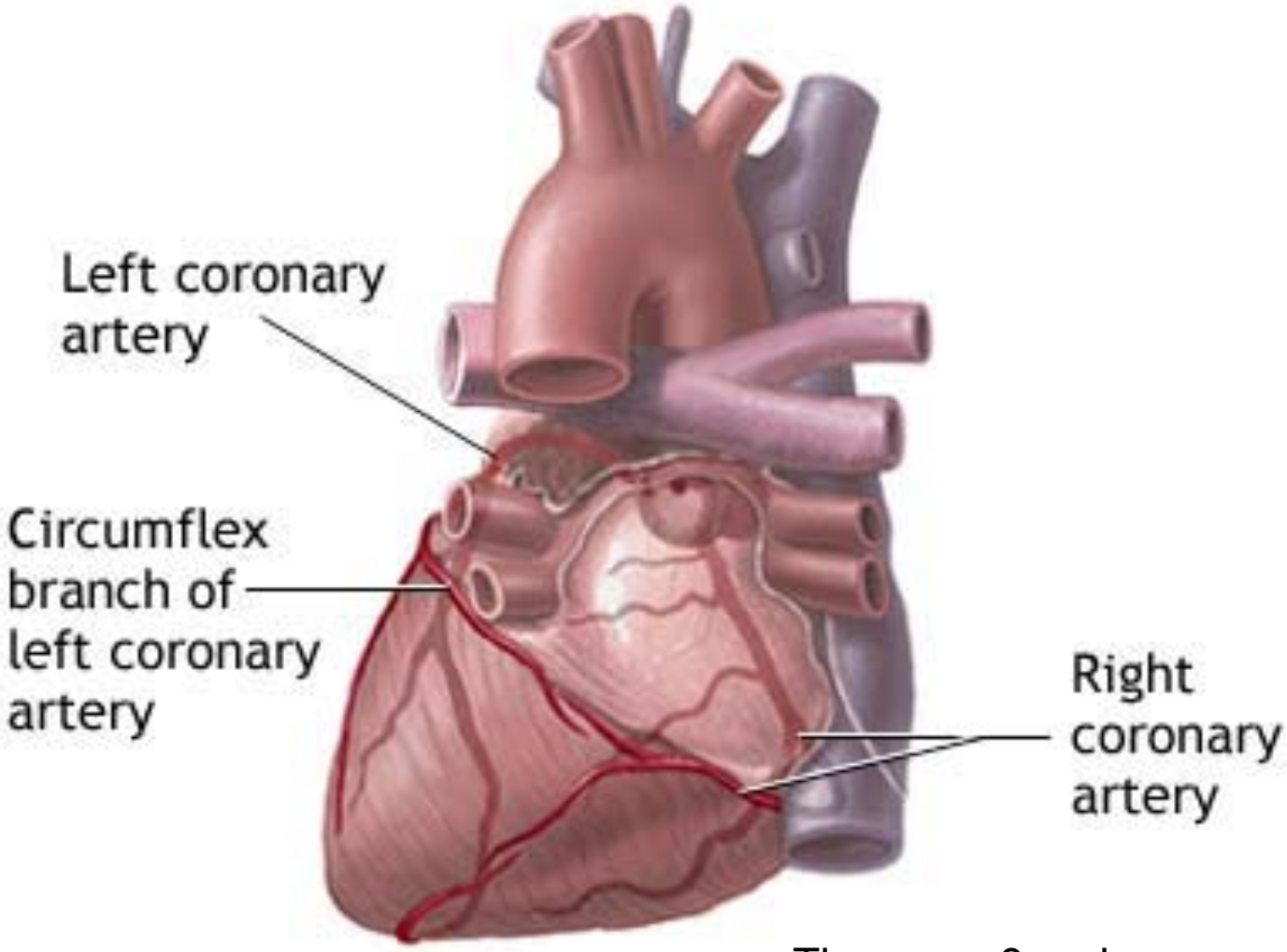
Hani Kozman, MD, FACC
Director, Cardiac Catheterization Laboratory
Upstate University Hospital

Acute Coronary Syndromes

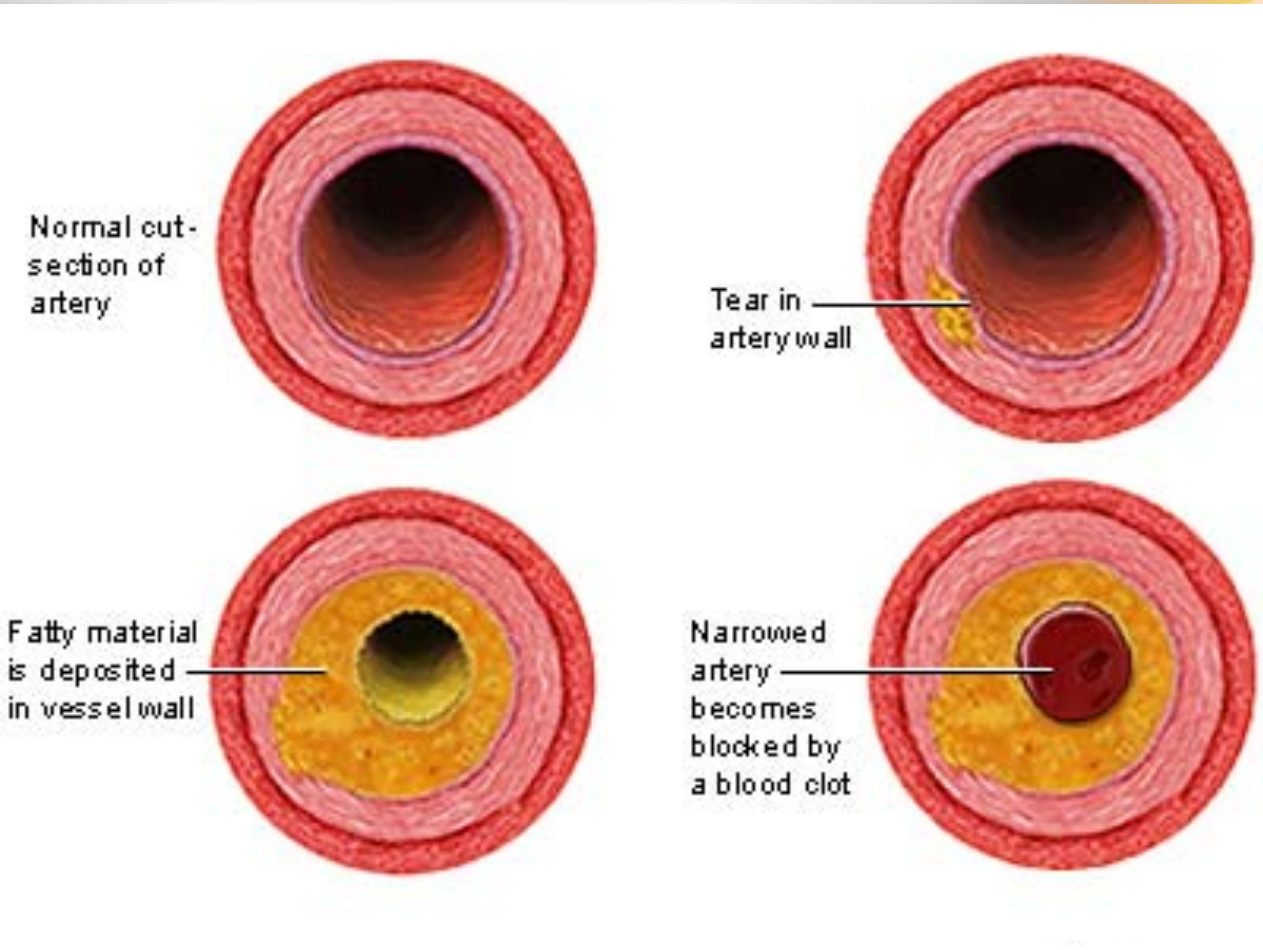
- Also known as **ACS**.
- Due to an enlarging clot in a coronary artery which can cause chest pain and damage to the heart muscle.
- When damage occurs to the heart muscle, a **myocardial infarction** occurs – most people know this as a “heart attack”.



The coronary arteries sit on top of the heart and supply blood to the heart muscle.

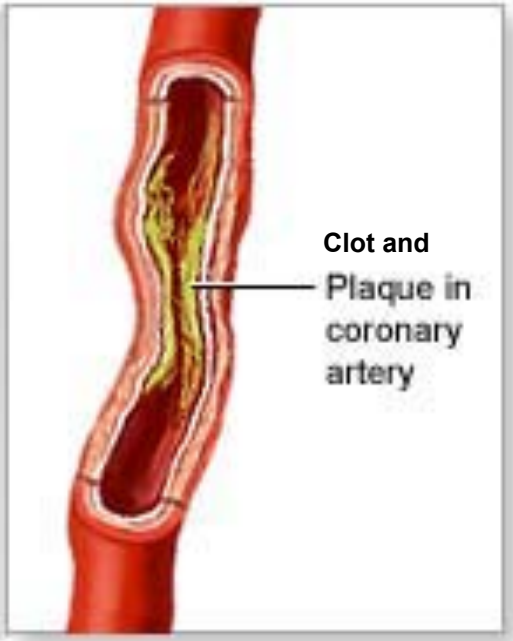


There are 3 major coronary arteries – the left anterior descending, circumflex and right coronary arteries.

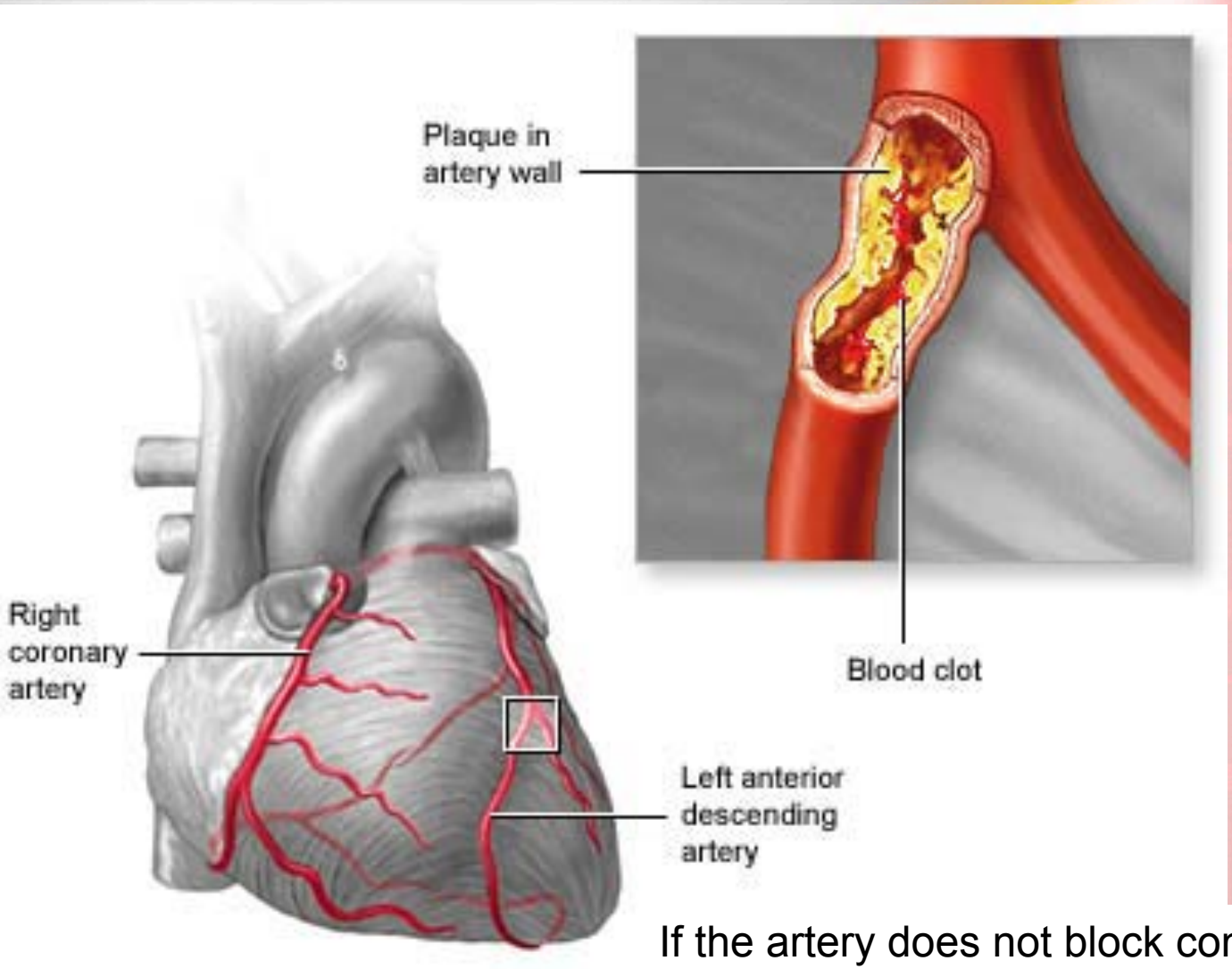


Cholesterol build up in the coronaries is known to start as early as age 17 as found on autopsies of Korean War soldiers. Over time, the cholesterol plaque can get so large that it ruptures. When the cholesterol enters the blood stream, a clot forms, causing diminished blood flow to the heart muscle. This lack of blood flow causes chest pain and damage to the heart muscle.

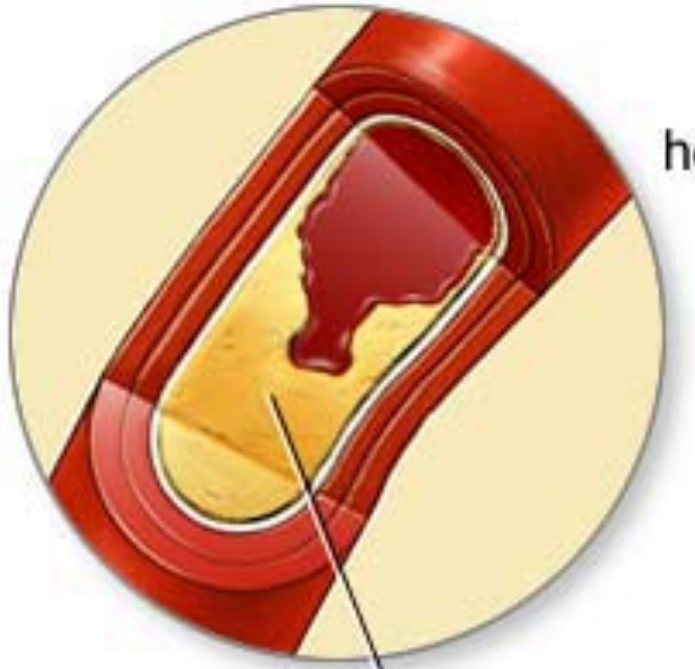
Insufficient blood flow to the heart muscle from narrowing of coronary artery may cause chest pain

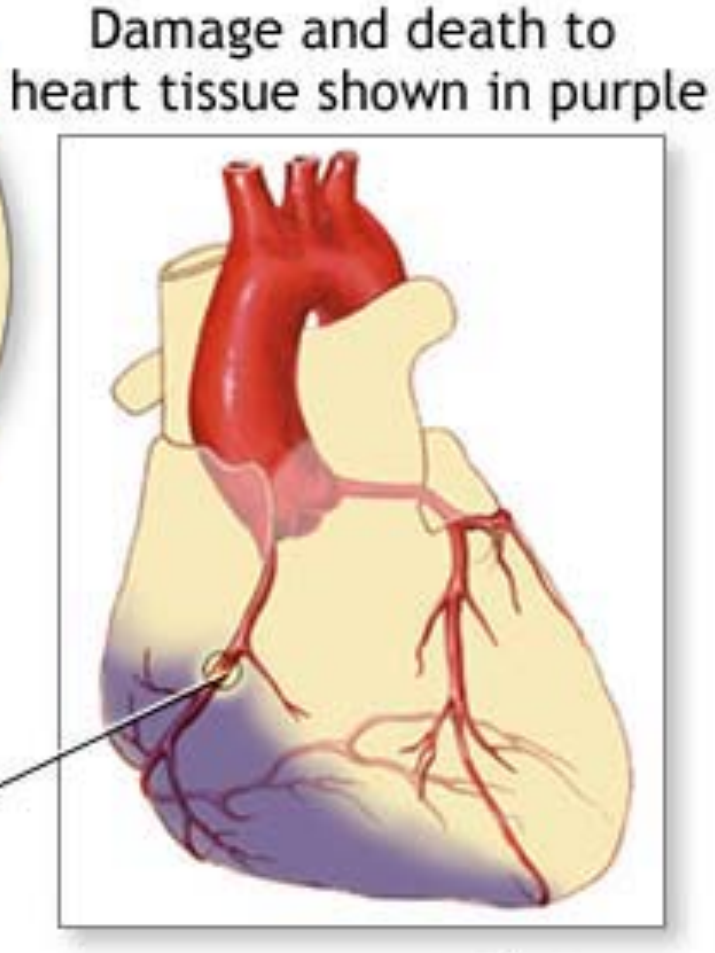


If the artery doesn't block completely with clot, damage may not occur to the heart muscle. The chest pain would then be called **unstable angina.**



If the artery does not block completely, less damage usually occurs to the heart muscle than with complete blockage. There are less obvious changes on the electrocardiogram (ECG) as well.





If blood flow is blocked completely to the heart muscle, damage will definitely occur. This type of acute coronary syndrome – generally known as **acute myocardial infarction** – is very dangerous and requires immediate action to relieve the obstruction and prevent permanent damage. Generally this is achieved with a procedure called an angioplasty.

Acute Coronary Syndromes

- You should consider that you may be having a heart attack if you have chest pain lasting more than 30 minutes and:
  - Are a smoker.
  - Have diabetes.
  - Have high cholesterol.
  - Have a family history of heart attacks.
  - Have high blood pressure.
  - Have known coronary artery disease.
  - Are a man over the age of 45.

The more of these risk factors you have, the higher the likelihood your chest pain is coming from the heart.

Acute Coronary Syndromes

- The chest pain associated with acute coronary syndromes is usually:
  - Severe, in the middle of the chest.
  - Often described as crushing or pressure.
  - Can go into jaw, back, left arm.
  - Can be associated with nausea, vomiting, shortness of breath, dizziness, passing out.
- The chest pain may not be there and you may only have the other associated symptoms which often happens in the elderly and women.

Acute Coronary Syndromes

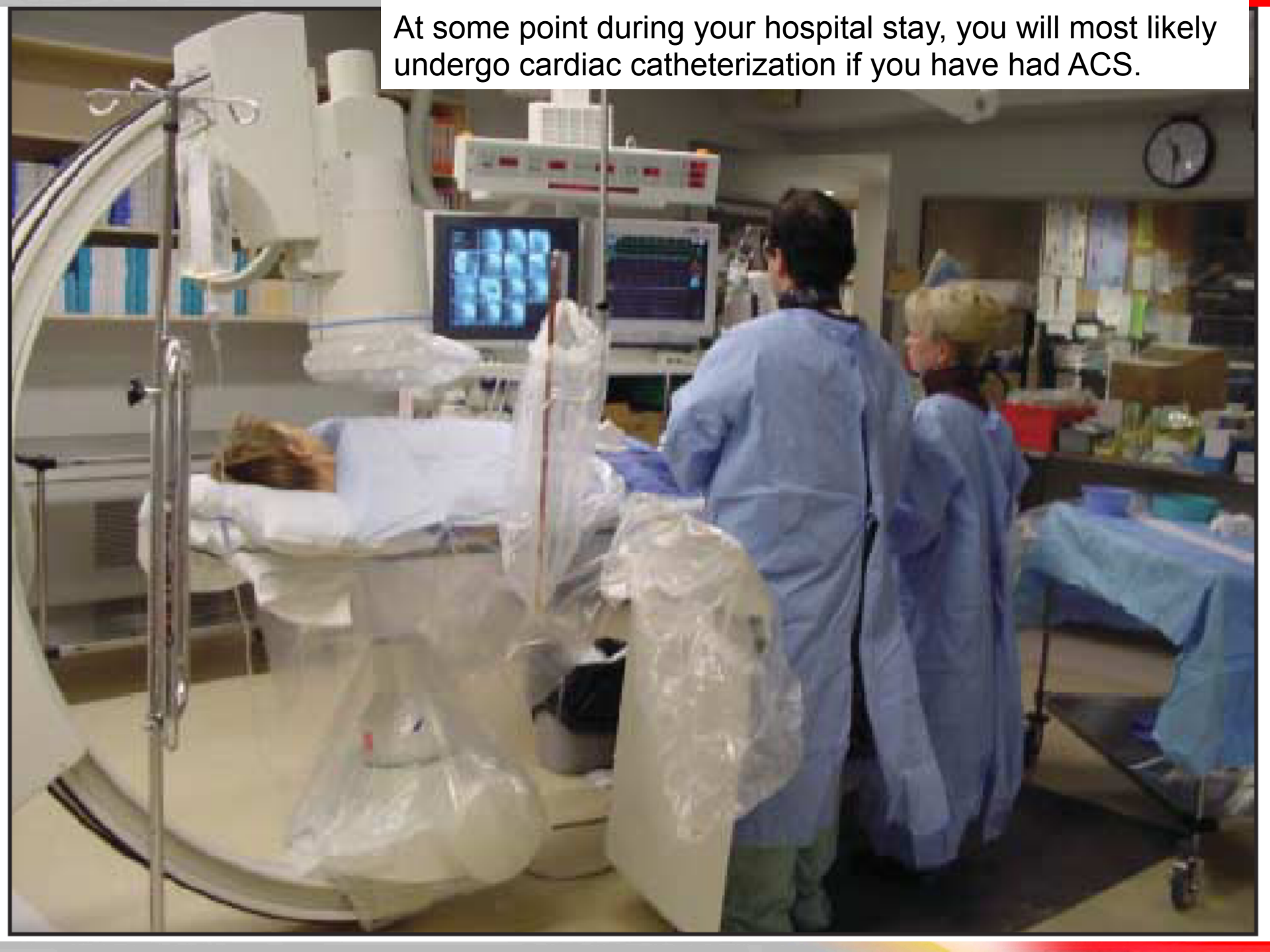
- You should go to the hospital or call 911 if you have chest pain lasting more than 30 minutes and any of the other features described in the previous 2 slides.
- **Don’t try to tough out severe chest pain at home. The longer you stay home with a heart attack, the more damage occurs, the less chance you have of surviving it.**

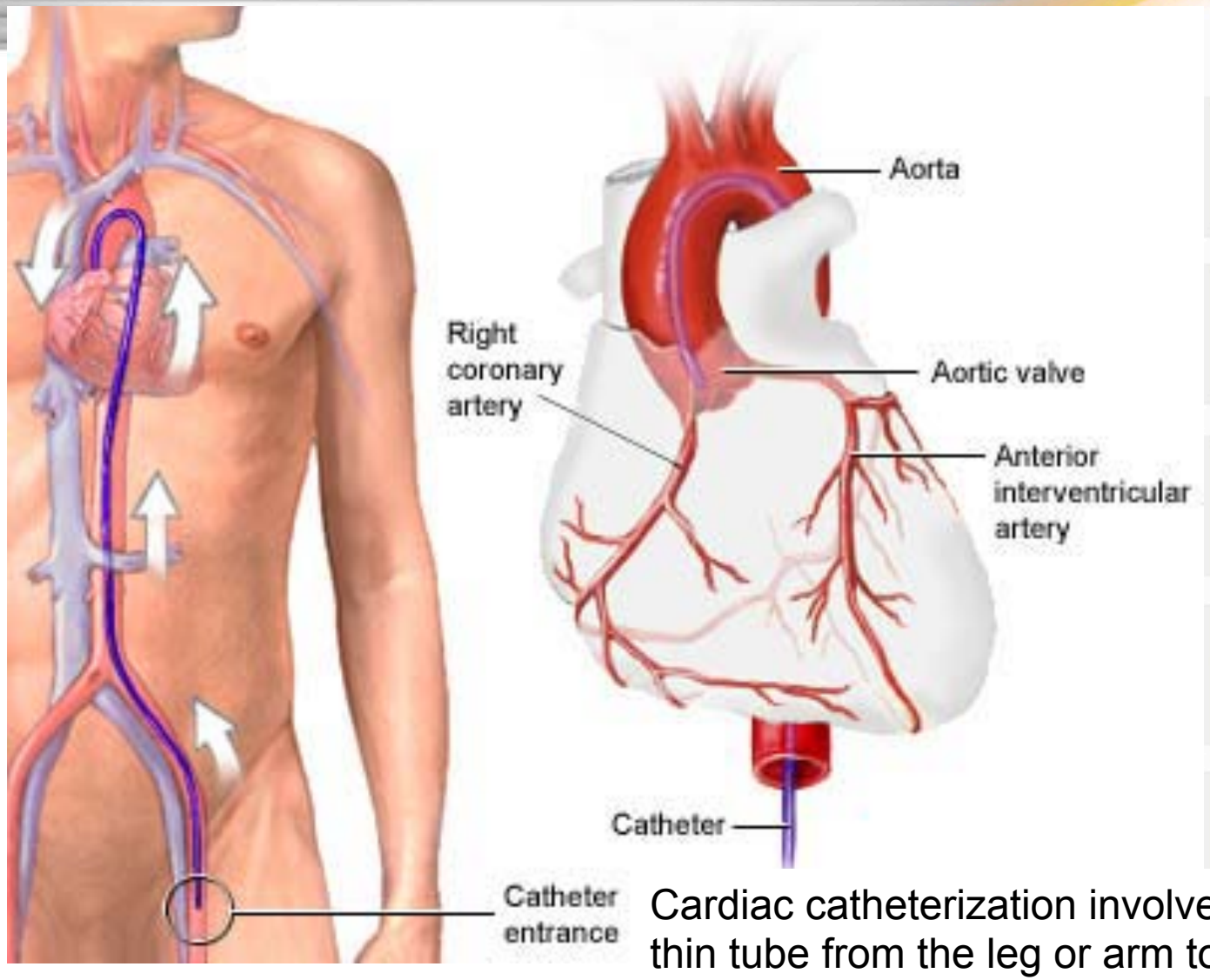
Acute Coronary Syndromes

- What you can do while waiting for ambulance:
  - Chew and swallow an aspirin.
  - Take a nitroglycerin under the tongue if you have it.
  - Lie down on chair, sofa.

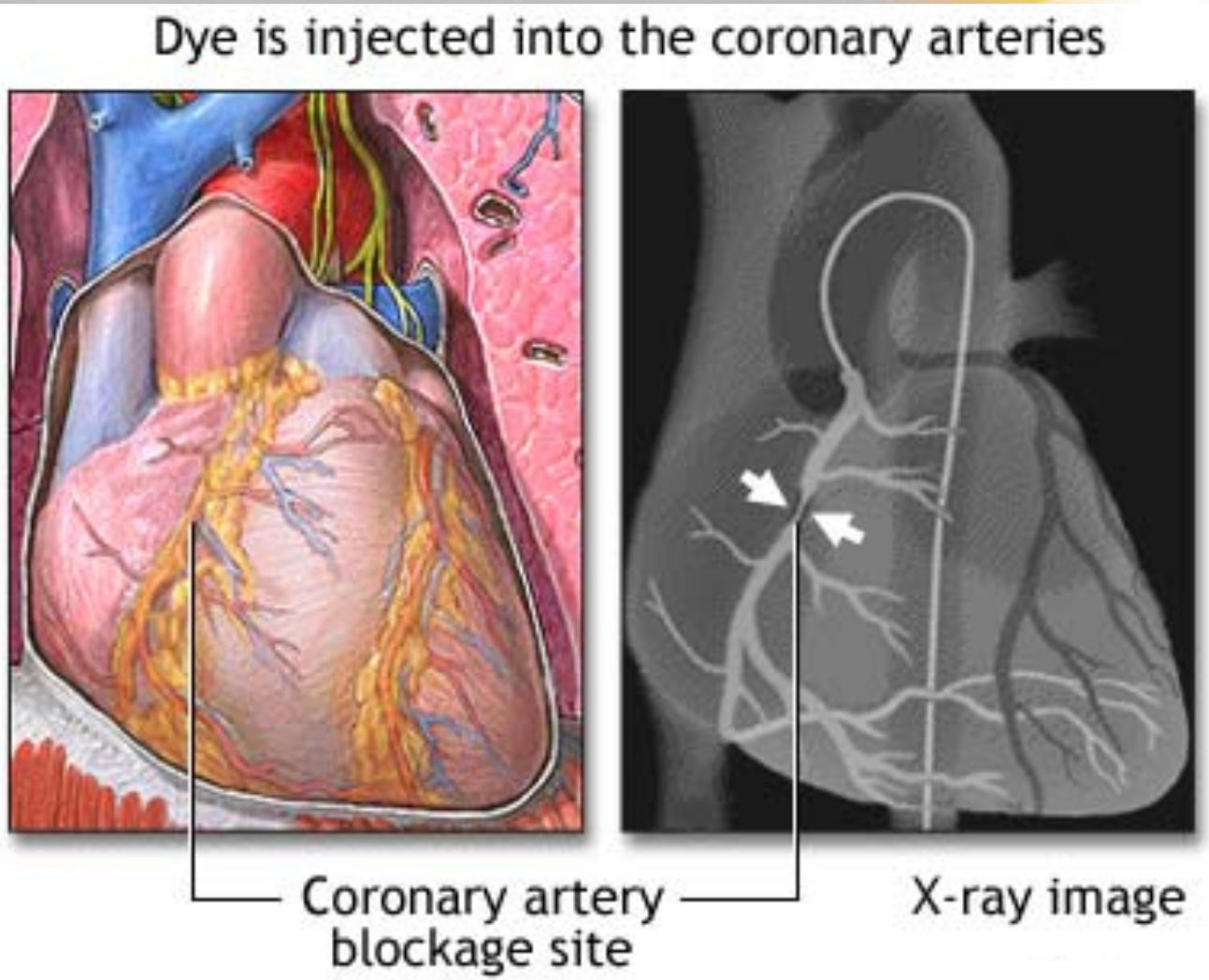
Acute Coronary Syndromes

- What to expect in the Ambulance and Emergency Department:
  - You will get an electrocardiogram.
  - An IV will be started.
  - You will be placed on oxygen.
  - You will be given aspirin and nitroglycerin under the tongue if you have not already taken them.
  - You will most likely be given pain medicine.
  - You will be given blood thinners to help dissolve the clot.
  - You may be taken urgently to the cardiac catheterization laboratory.


At some point during your hospital stay, you will most likely undergo cardiac catheterization if you have had ACS.



Cardiac catheterization involves passing a thin tube from the leg or arm to the heart. The skin is numbed before the tube is inserted. There are no nerves in the blood vessels, so you won't feel the tube going up.

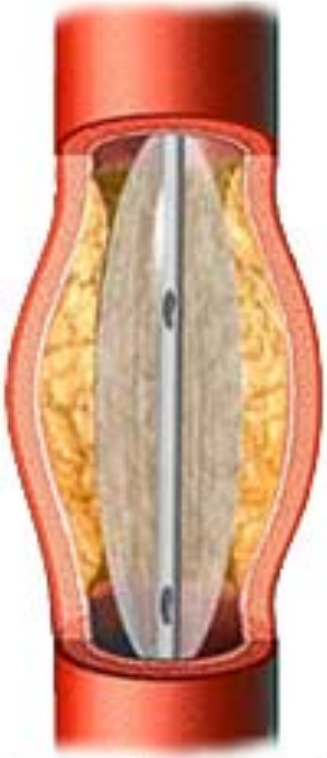


The site of obstruction is identified with dye injection.

This is how it looks with the heart beating.

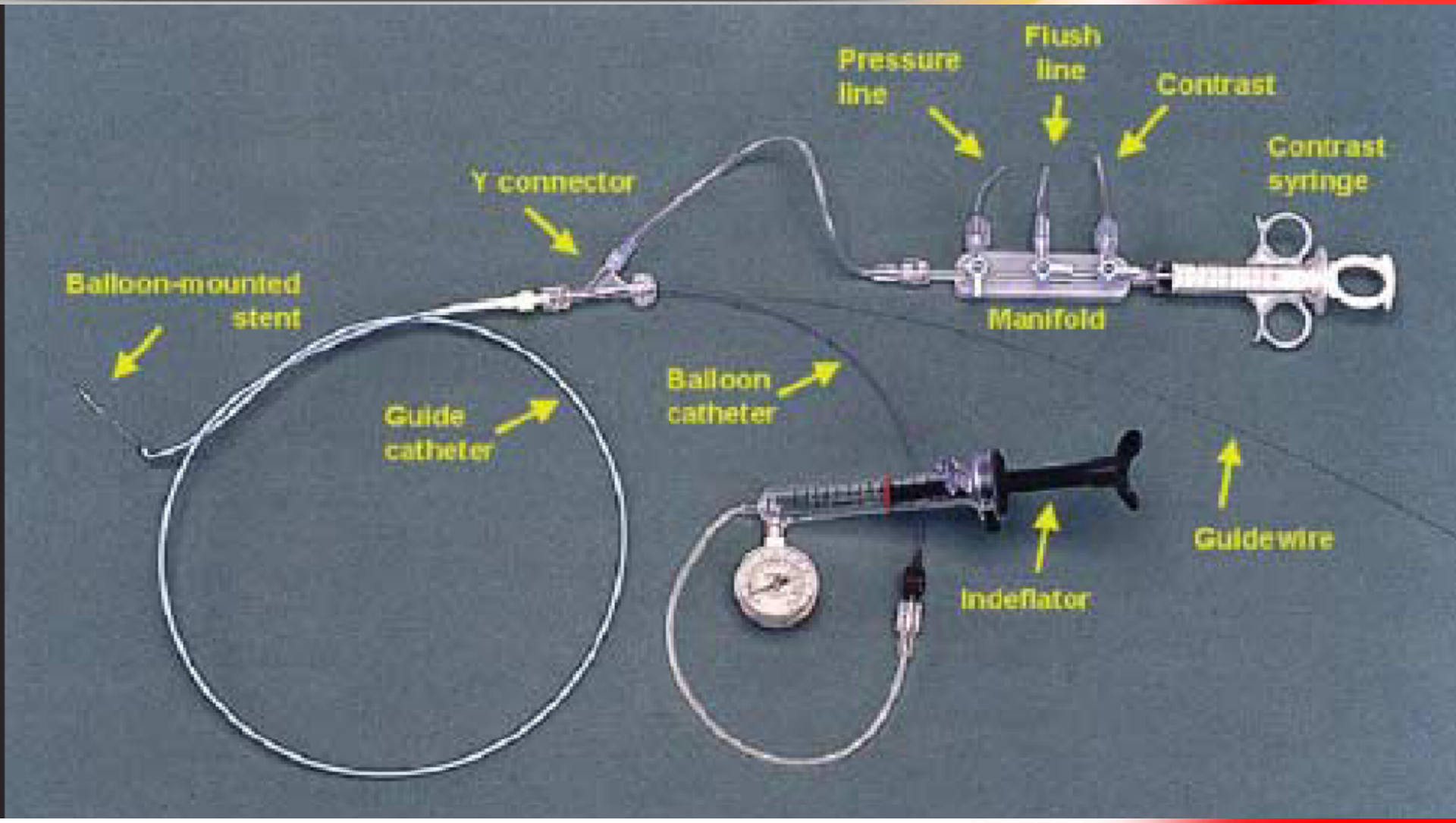
This is an angioplasty balloon. It is inserted through the tube along a wire, down to where the coronary obstruction is and inflated. That opens the artery and allows for blood flow to improve to the heart muscle, preventing further damage.

A balloon-tipped tube is inserted in coronary artery

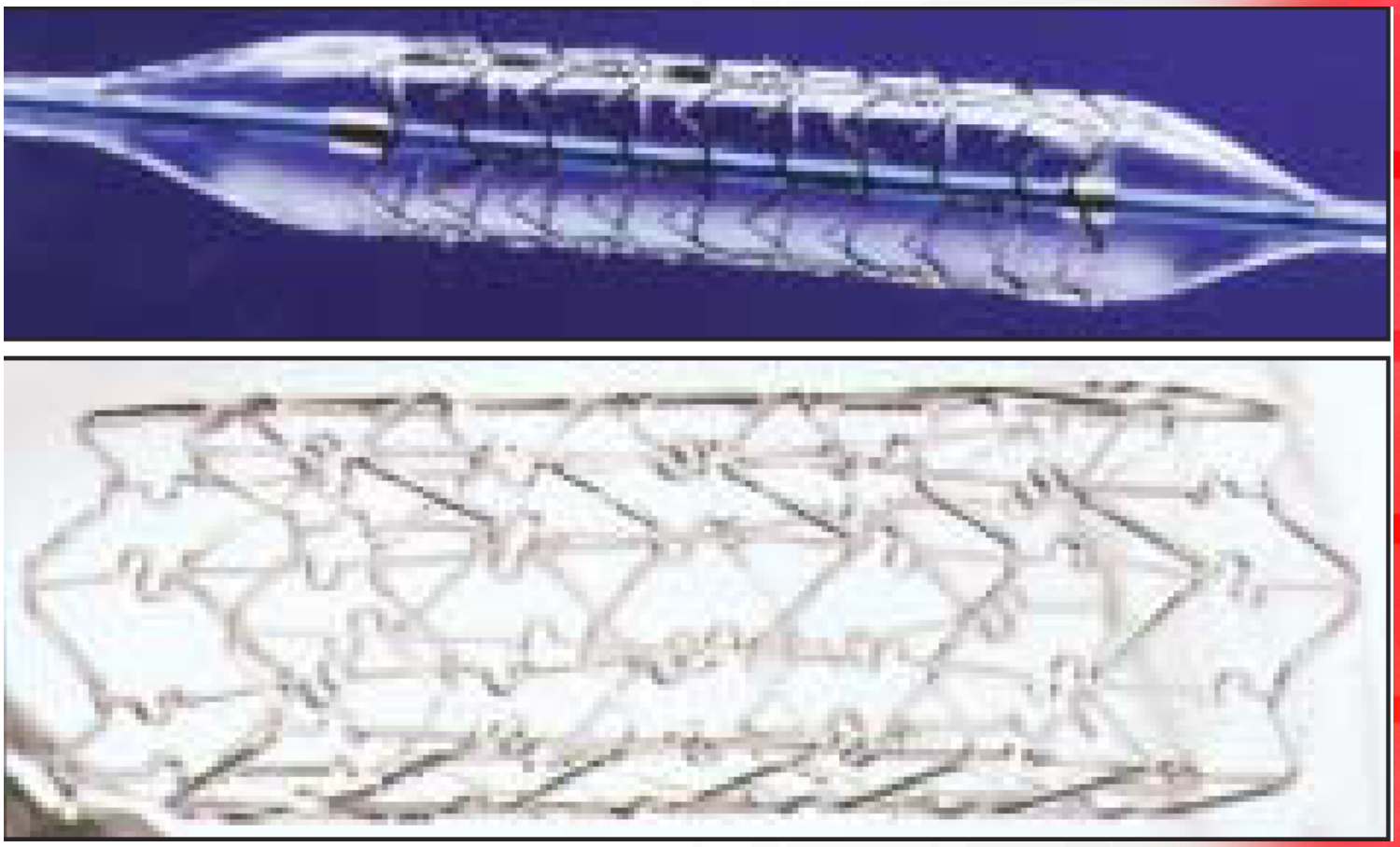


Balloon is expanded several times

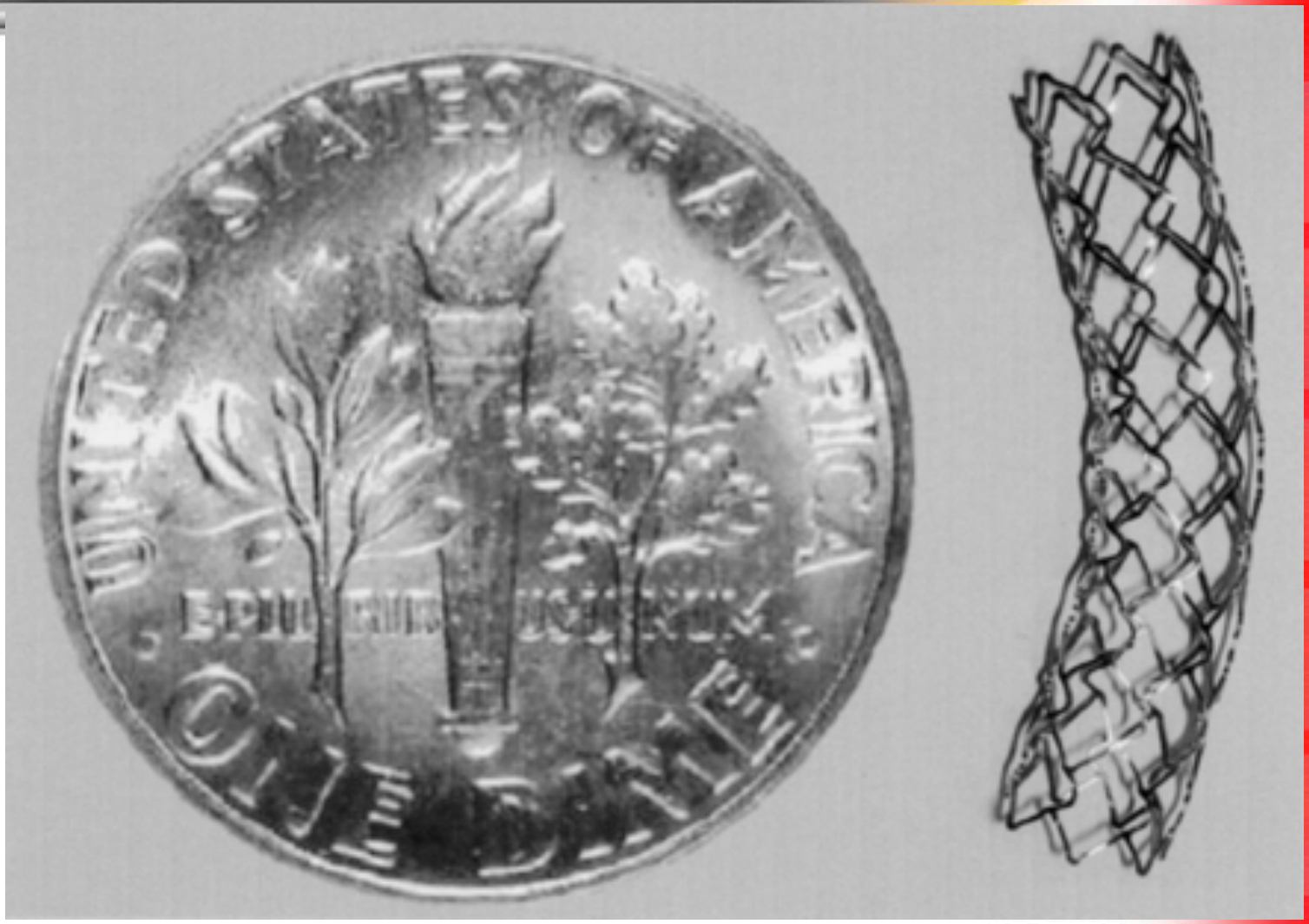
This is how the balloon looks inside the coronary artery.



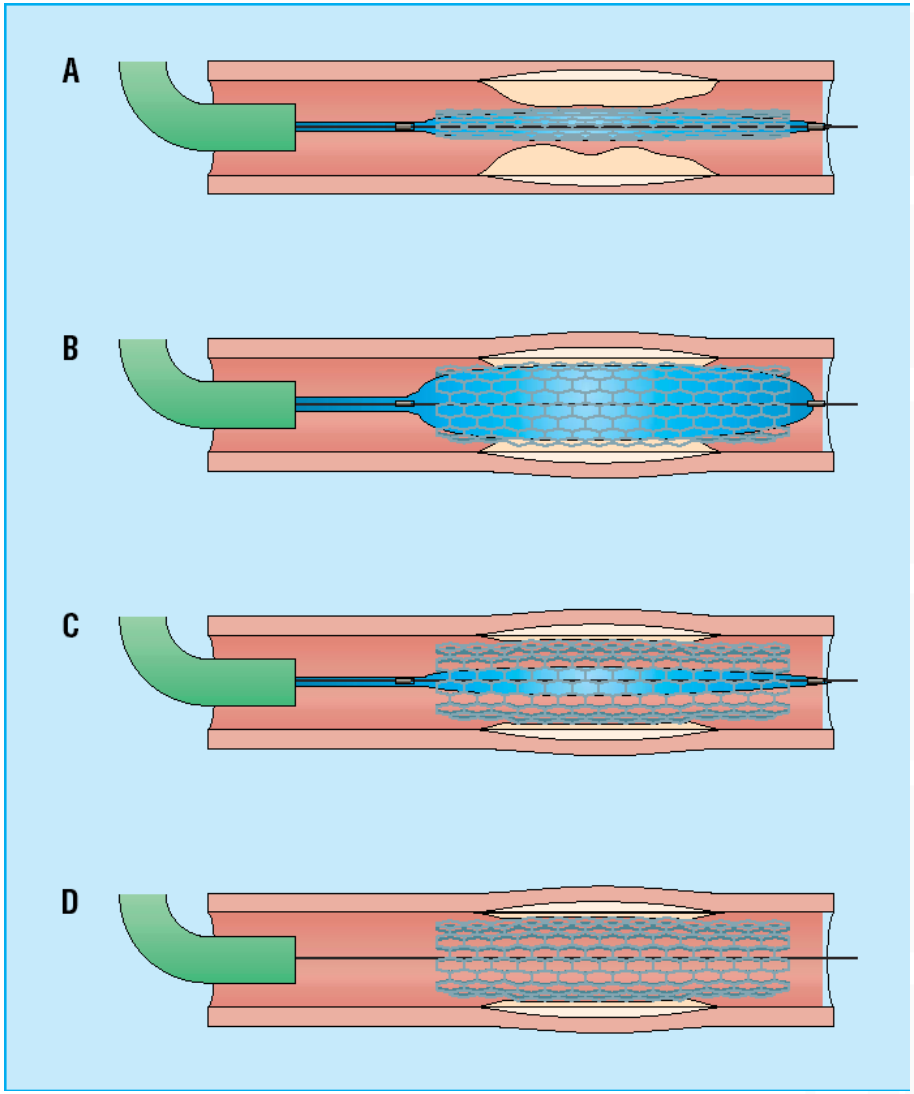
This is the set-up for performing the procedure.



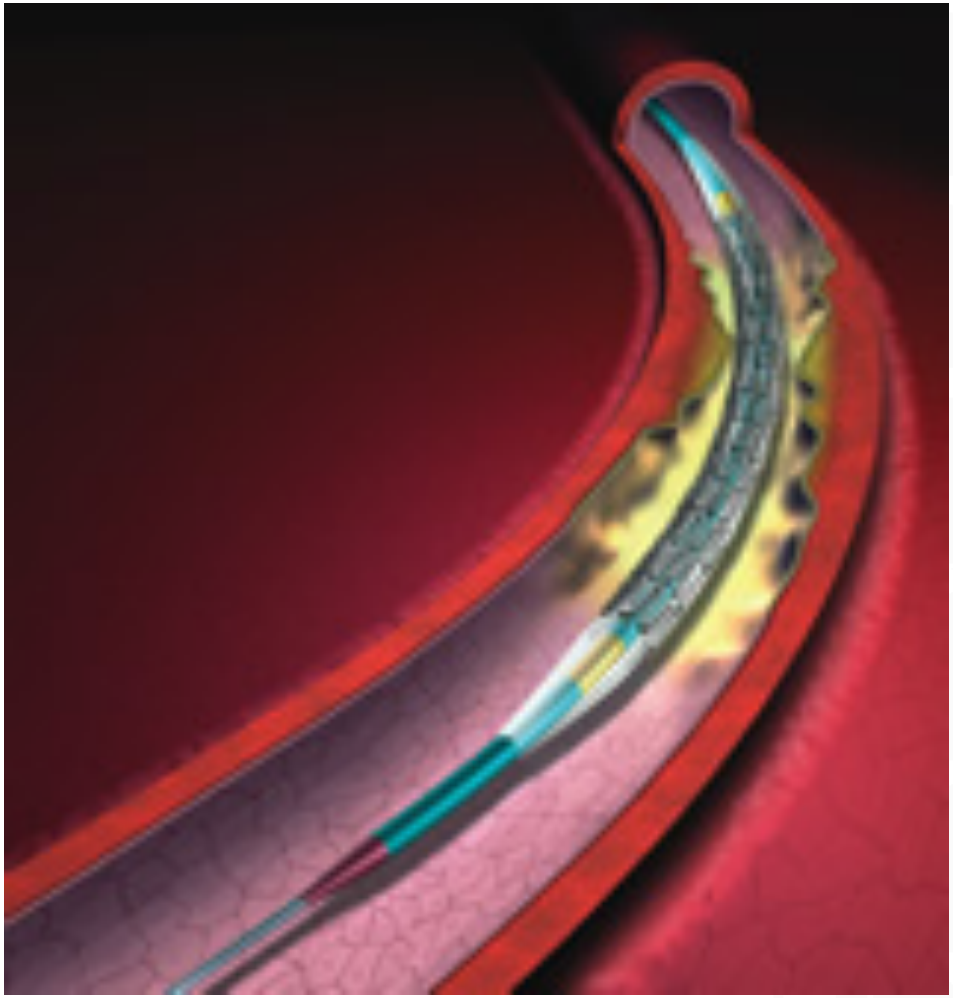
A stent is then placed inside the artery which is a metal scaffold to hold the artery open because the artery has a tendency to recoil back on itself.



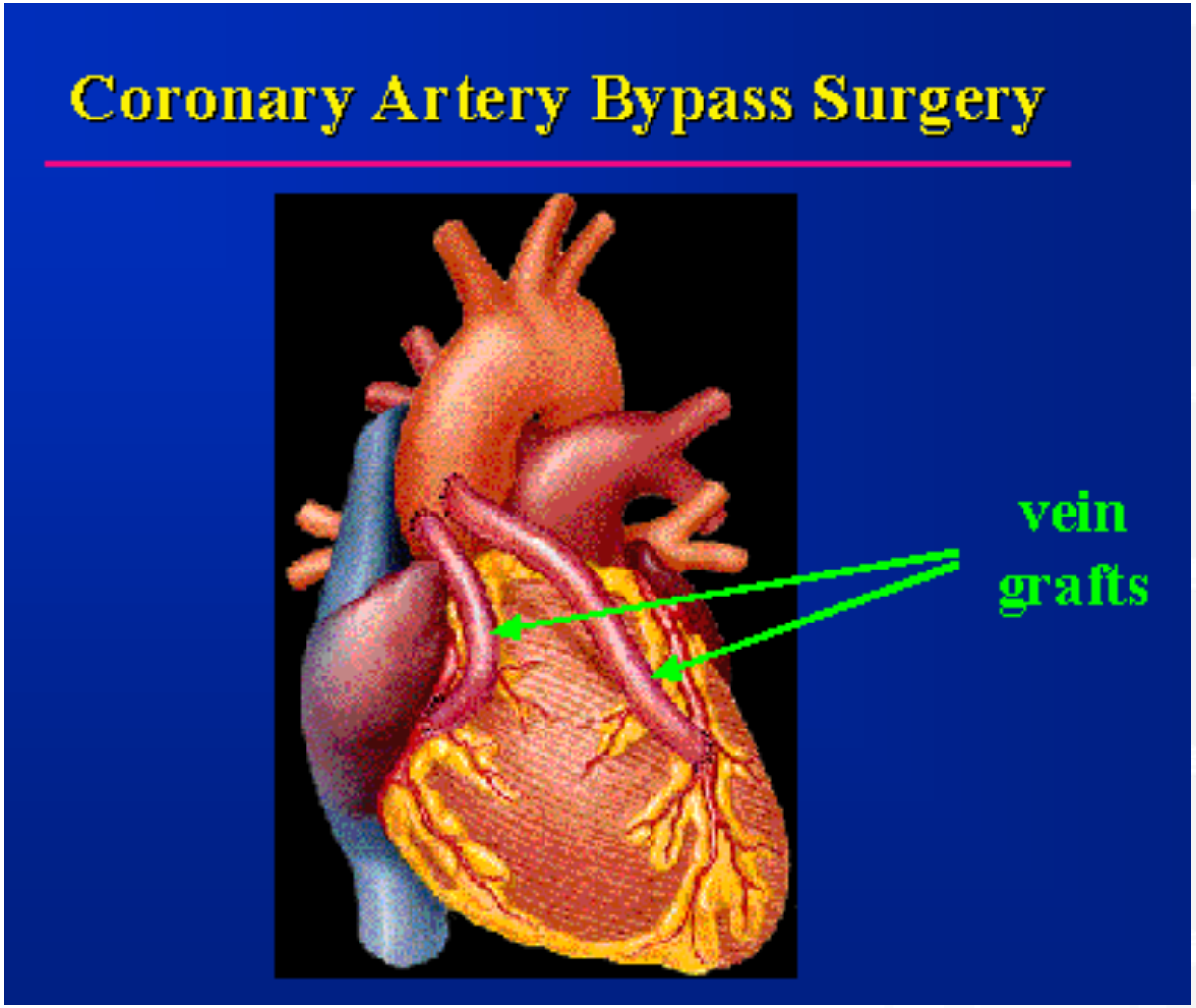
Stents are really small.



This is how the stent goes in the coronary. It stays in permanently and eventually cells grow on top of it so it becomes a part of the artery.



In some people, the cell overgrowth can be so vigorous that the artery blocks up again. Because of this problem, a large number of people are receiving stents coated with a medication that helps to prevent the overgrowth.



Occasionally for an acute coronary syndrome, coronary bypass surgery is required. This usually happens when multiple blockages are found in the coronary arteries or the position of the blockage would be too risky to fix with a stent. Surgeons use veins from the legs or arteries from the chest wall to “bypass” all the blockages.

Acute Coronary Syndromes

- The average patient remains in the hospital for 1-2 days after stent placement or 5-7 days after bypass surgery.
- When you get home it is important to:
  - Take it easy for a week or two (longer after bypass surgery) – particularly no heavy lifting > 25 pounds.
  - Take your medications as prescribed by your doctor – particularly the Plavix or similar blood-thinning drug. **Stopping this drug suddenly after a stent without permission from your cardiologist may result in a more serious heart attack than the first time around.**
  - Stop smoking.
  - Lose weight or at least try to follow a low-fat, low calorie diet.
  - Stay active, 30 minutes of walking per day can make an enormous difference. Consider joining a cardiac rehabilitation program.