

# HEART DISEASES

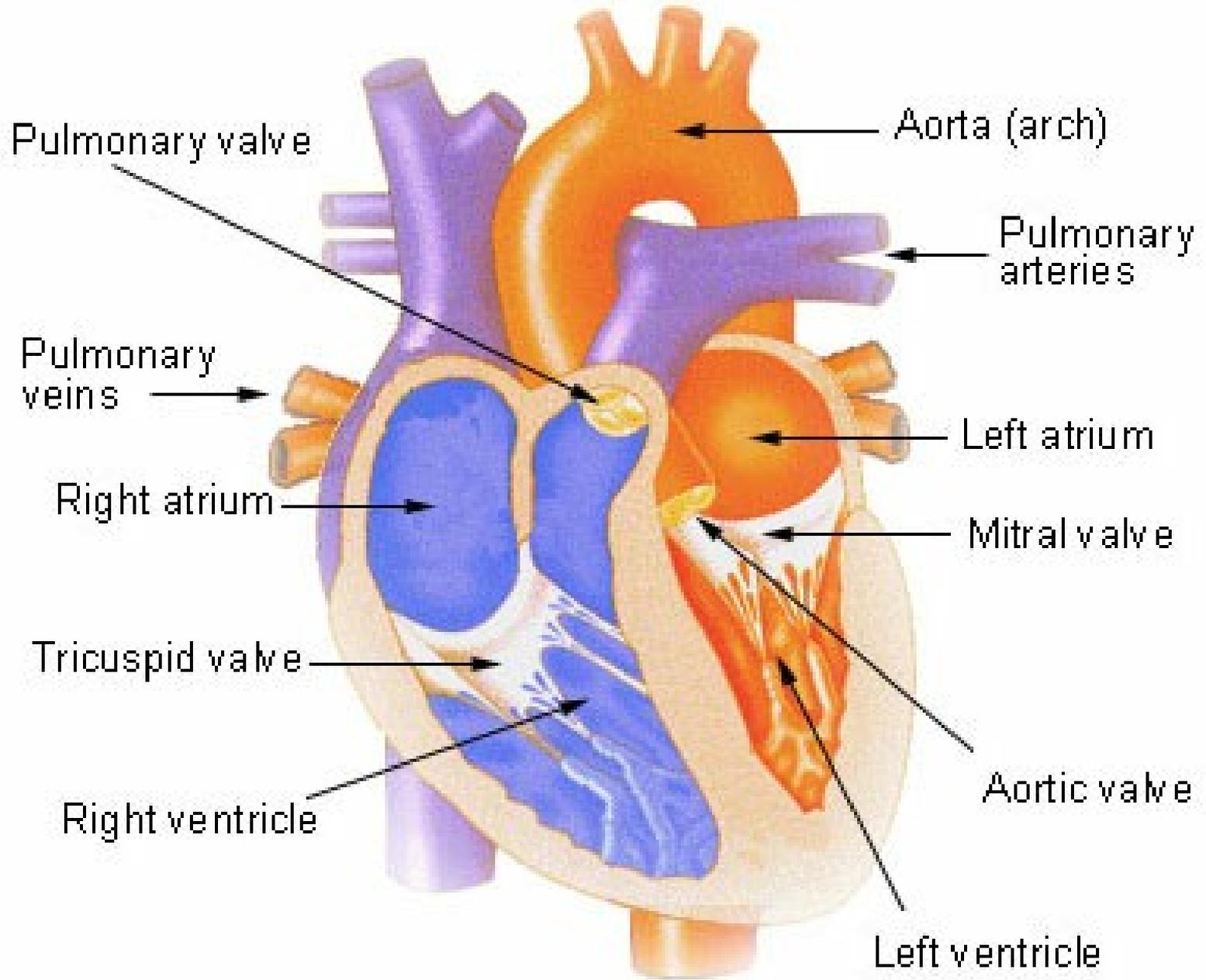


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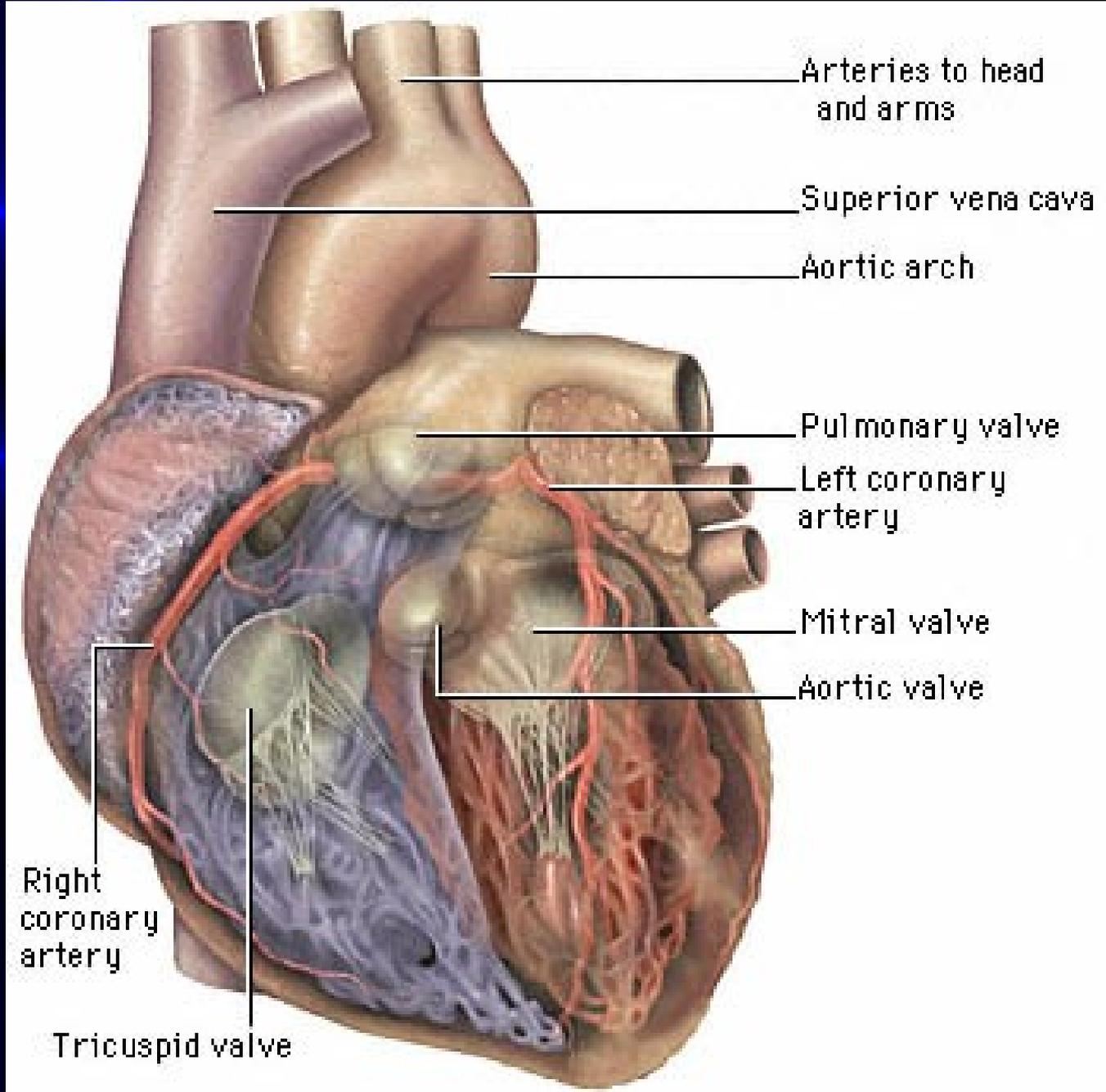
# INTERNAL VIEW OF THE HEART

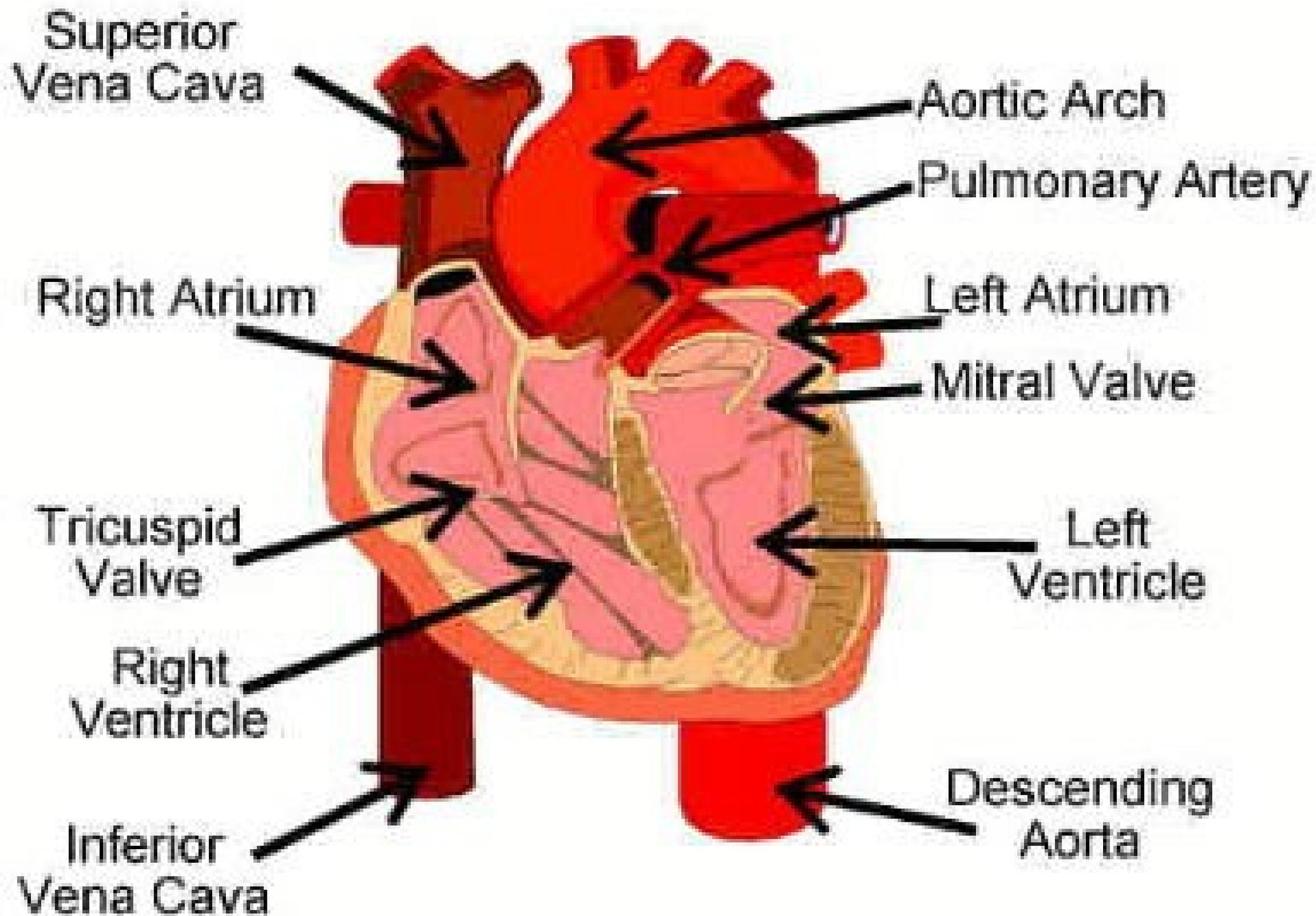


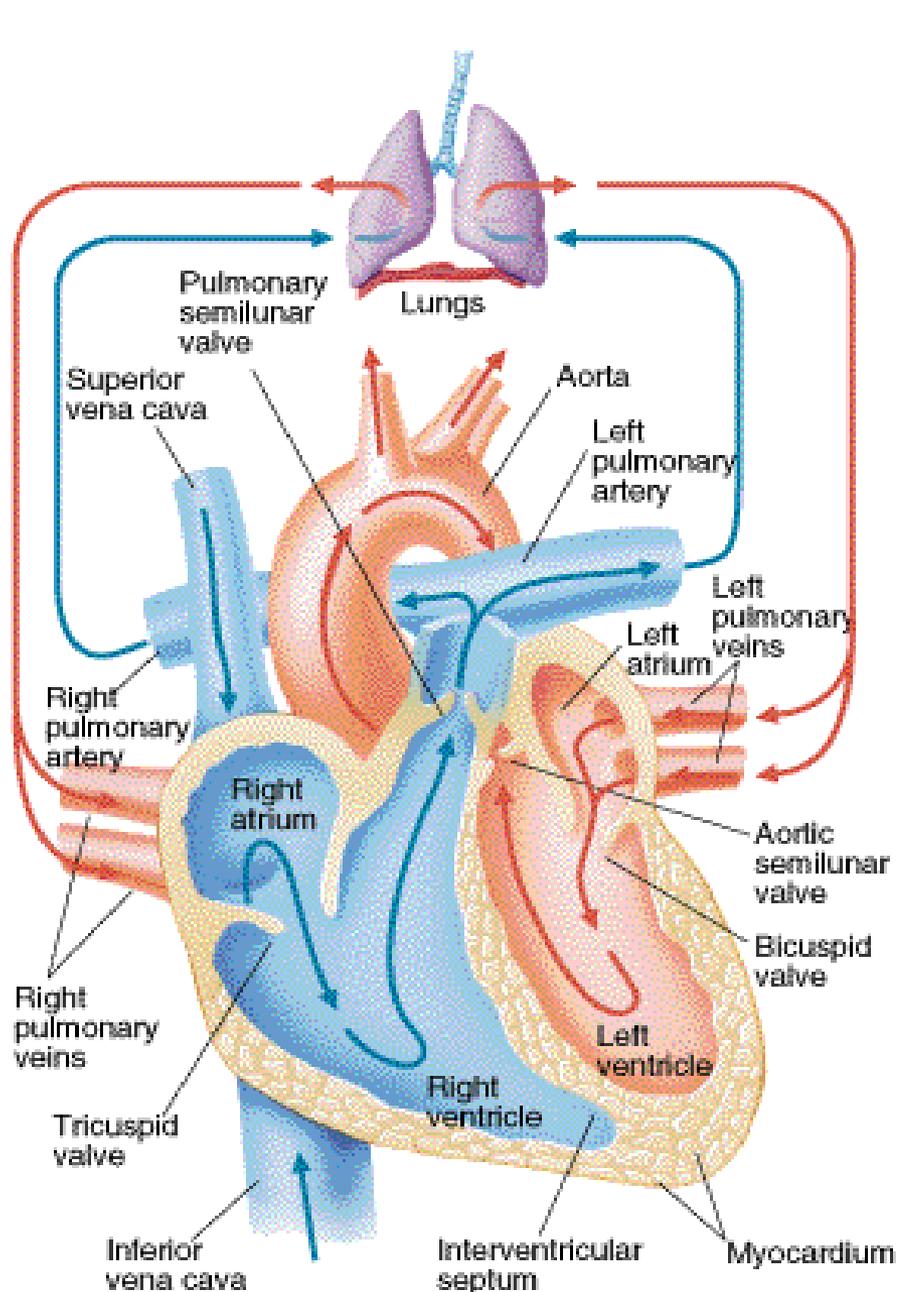
## Chambers:

The heart is divided by a septum into two halves. The halves are in turn divided into chambers. The upper two chambers of the heart are called **atria** and the lower two chambers are called **ventricles**. **Valves** allow blood to flow in one direction between the chambers of the heart.

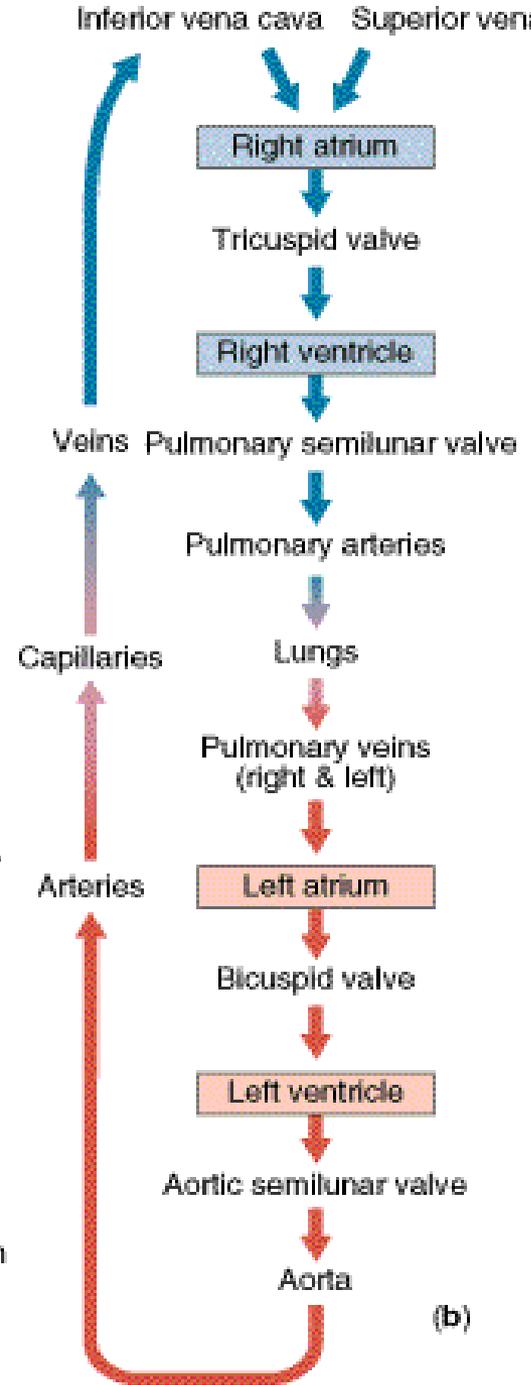
# INTERIOR STRUCTURES OF THE HEART



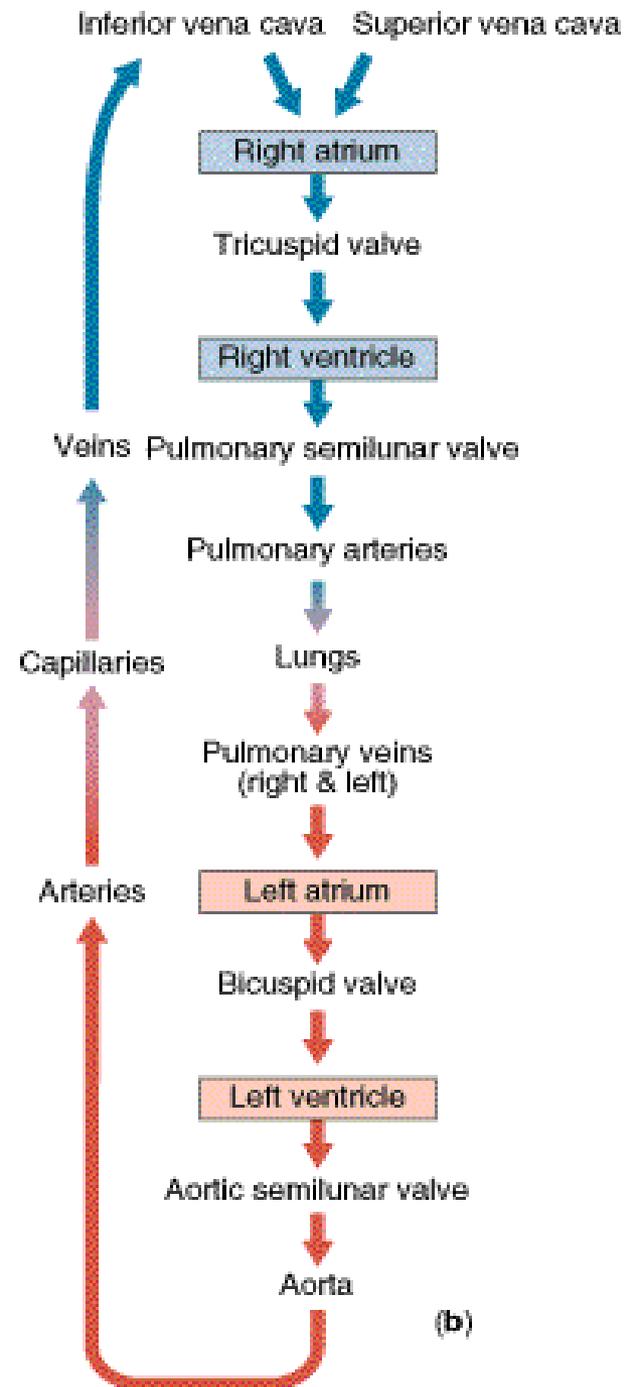
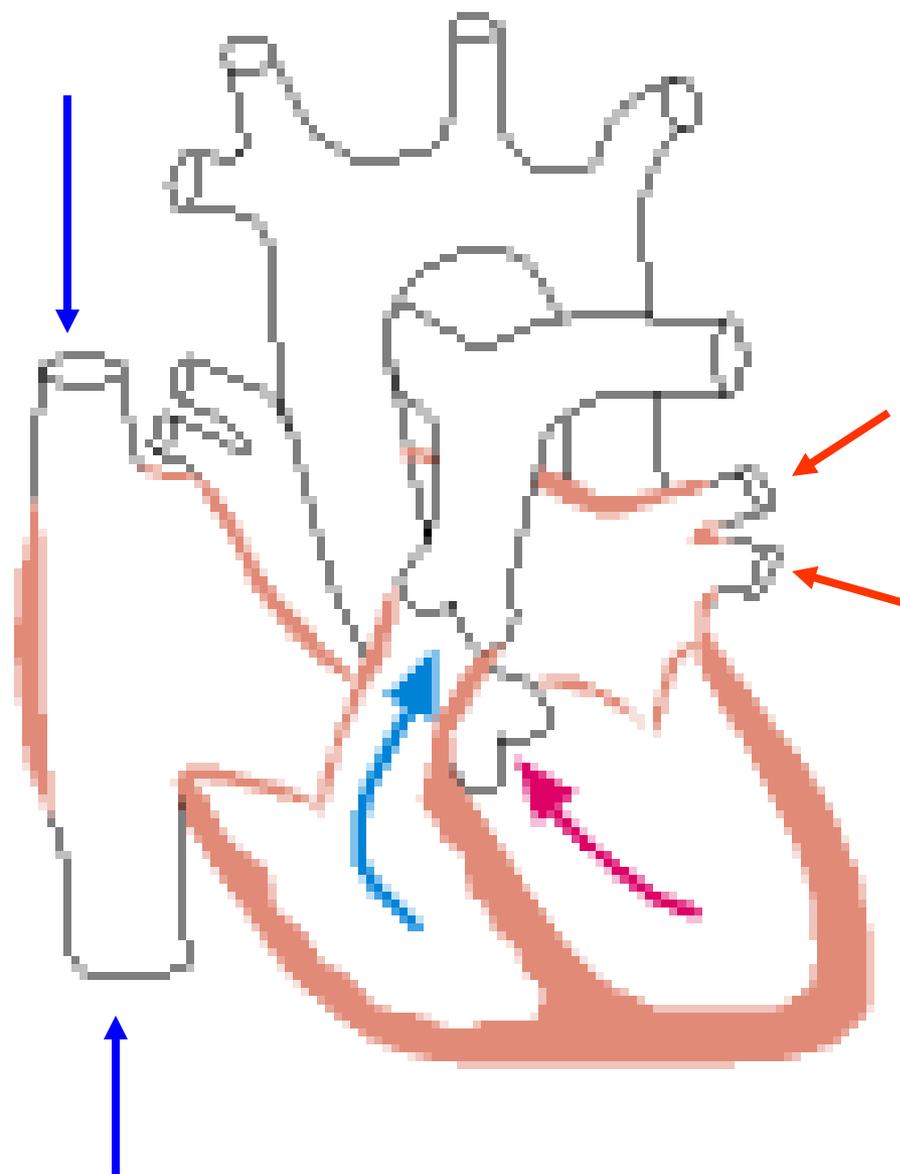




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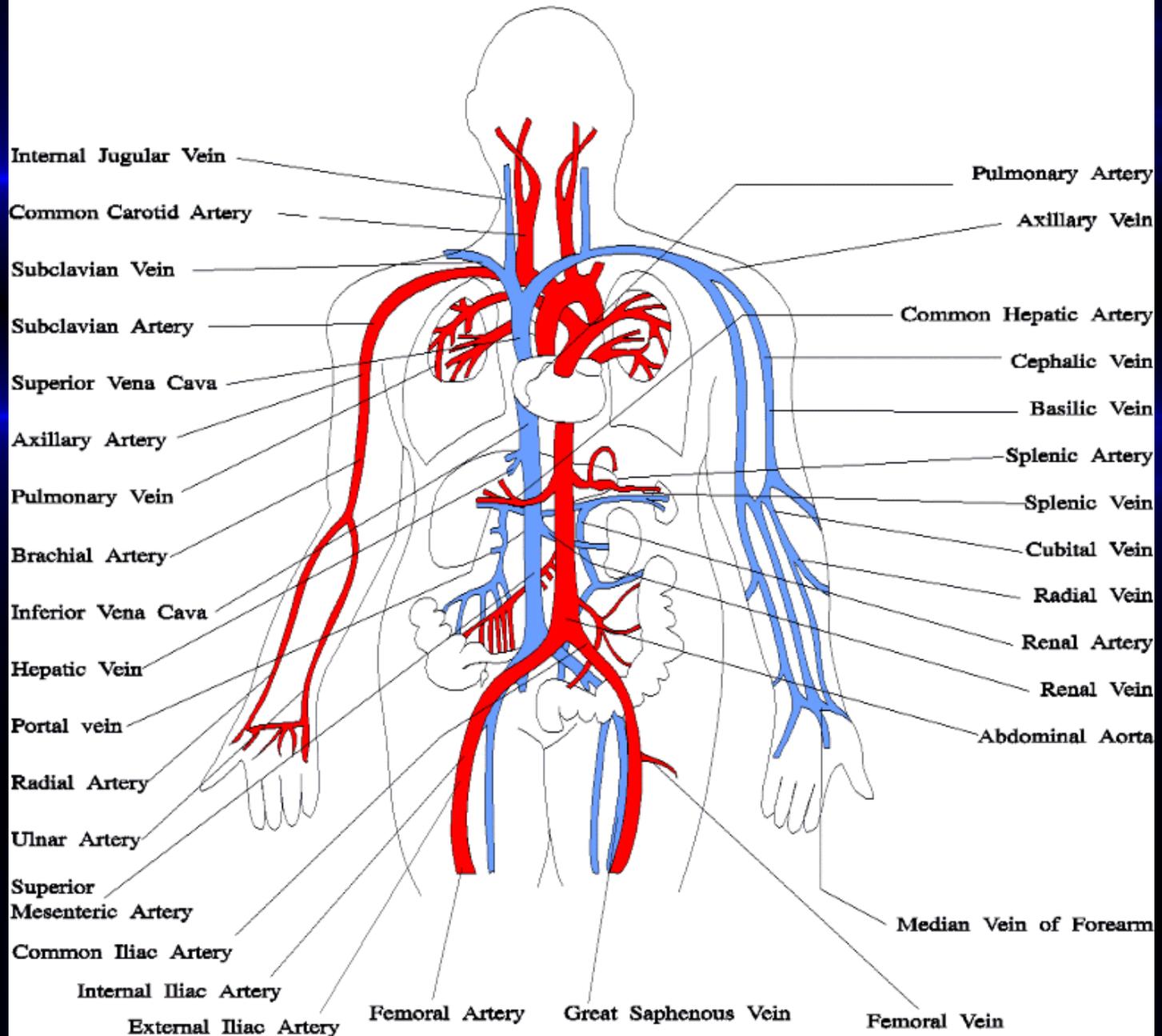


(b)



# Blood Circulation

## Principal Veins and Arteries



# DISEASES OF THE HEART

- The diseases and conditions affecting the heart are collectively known as heart disease.
- The heart consists of a muscle that pumps blood, arteries that supply blood to the heart muscle, and valves that ensure that the blood within the heart is pumped in the correct direction.
- Problems can arise in any of these areas.
- Like cardiovascular disease, heart disease is a term that's somewhat loose and broad, and it's often used that way.

Heart disease is an umbrella term for a number of different diseases which affect the heart. The most common heart diseases are:

- ❖ Coronary artery disease.
- ❖ Coronary heart disease.
- ❖ Ischaemic heart disease.
- ❖ Cardiovascular disease
- ❖ Pulmonary heart disease.
- ❖ Hereditary heart disease.
- ❖ Hypertensive heart disease.
- ❖ Inflammatory heart disease.
- ❖ Valvular heart disease.
- ❖ Pericardial disease
- ❖ Congenital heart disease
- ❖ Heart failure

❖ **Coronary artery disease (CAD)**, These are diseases of the arteries that supply the heart muscle with blood. CAD is one of the most common forms of heart disease and the leading cause of heart attacks. It generally means that blood flow through the coronary arteries has become obstructed. The most common cause of such obstructions is a condition called atherosclerosis, a largely preventable type of vascular disease. Coronary artery disease can lead to other heart problems, such as chest pain (angina) and heart attack (myocardial infarction).

- ❖ **Coronary heart disease**, a disease of the heart itself caused by the accumulation of atheromatous plaques within the walls of the arteries that supply the myocardium
- ❖ **Ischaemic heart disease**, another disease of the heart itself, characterized by reduced blood supply to the organ.
- ❖ **Cardiovascular disease**, a sub-umbrella term for a number of diseases that affect the heart itself and/or the blood vessel system, especially the veins and arteries leading to and from the heart. Causes of cardiovascular disease include diabetes mellitus, hypertension and hypercholesterolemia.

- ❖ **Pulmonary heart disease**, a failure of the right side of the heart.
- ❖ **Hereditary heart disease**, heart disease caused by unavoidable genetic factors
- ❖ **Hypertensive heart disease**, heart disease caused by high blood pressure, especially localised high blood pressure
- ❖ **Inflammatory heart disease**, heart disease that involves inflammation of the heart muscle and/or the tissue surrounding it.
- ❖ **Valvular heart disease**, heart disease that affects the valves of the heart.

❖ **Pericardial disease**, These are diseases of the sac that encases the heart (pericardium). Pericardial disorders include inflammation (pericarditis), fluid accumulation (pericardial effusion) and stiffness (constrictive pericarditis). These can occur alone or together. The causes of pericardial disease vary, as do the problems they may lead to. For instance, pericarditis can occur after a heart attack and, as a result, lead to pericardial effusion or chest pain.

❖ **Congenital heart disease**, These are forms of heart disease that develop before birth (congenital). Congenital heart disease is a broad term and includes a wide range of diseases and conditions. These diseases can affect the formation of the heart muscle or its chambers or valves. They include such conditions as narrowing of a section of the aorta (coarctation) or holes in the heart (atrial or ventricular septal defect). Some congenital heart defects may be apparent right at the time of birth, while others may not be detected until later in life.

❖ **Heart failure**, often called congestive heart failure, is a condition in which the heart can't pump enough blood to the body's organs and tissues. It doesn't mean the heart has failed and can't pump blood at all. With this less effective pumping, vital organs don't get enough blood, causing such signs and symptoms as shortness of breath, fluid retention and fatigue. Congestive heart failure is technically reserved for situations in which heart failure has led to fluid buildup in the body. Not all heart failure is congestive, but the terms are often used interchangeably. Heart failure may develop suddenly or over many years. It may occur as a result of other cardiovascular conditions that have damaged or weakened the heart, such as coronary artery disease or cardiomyopathy.

# DISEASES OF THE BLOOD VESSELS

Blood vessels are essentially hollow tubes that carry blood to the organs and tissues throughout the body.

- ❖ **Arteries:** These blood vessels carry blood away from the heart and out to the body, delivering oxygen and nutrients. The aorta is the largest blood vessel of all.
- ❖ **Veins:** These blood vessels carry deoxygenated blood back to the heart. Lacking oxygen, they have a bluish cast on the skin.

- ❖ **Capillaries:** These tiny vessels connect arteries and veins.
- ❖ **Lymphatics:** Fluid leaks out of capillaries to bathe cells. Lymphatics are delicate vessels that carry this fluid back into the body's central circulation.
- Blood vessels have many layers and a complex mechanism of action to keep blood flowing to all of the vital organs.
- Despite that big responsibility – probably don't pay much attention to the blood vessels – until something goes wrong, that is.

## Some types of blood vessel disorders:

- ❖ Arteriosclerosis and atherosclerosis.
- ❖ High blood pressure (hypertension).
- ❖ Stroke.
- ❖ Aneurysm.
- ❖ Peripheral arterial disease and claudication.
- ❖ Vasculitis.
- ❖ Venous incompetence.
- ❖ Venous thrombosis.
- ❖ Varicose veins.
- ❖ Lymphedema.

❖ **Arteriosclerosis and atherosclerosis**, are conditions in which the walls of the arteries become thick and stiff. This can sometimes restrict blood flow to the organs and tissues. The process of this thickening and stiffening is arteriosclerosis. Atherosclerosis is the most common form of arteriosclerosis. Although the two terms are often used interchangeably, atherosclerosis refers to hardening of the arteries caused by accumulation of fatty deposits (plaques) and other substances. The heart is one of the organs commonly affected by atherosclerosis. When the arteries of the heart (coronary arteries) narrow – may experience chest pain or a heart attack.

❖ High blood pressure (hypertension), is the excessive force of blood pumping through the blood vessels. It's perhaps the most common form of cardiovascular disease in the Western world, affecting about one in four Americans. Although potentially life-threatening, it's one of the most preventable and treatable types of cardiovascular disease. High blood pressure also causes many other types of cardiovascular disease, such as stroke and heart failure.

- ❖ **Stroke**, is a sudden loss of brain function. It occurs when blood flow to the brain is interrupted (ischemic stroke) or when blood vessels in the brain rupture (hemorrhagic stroke). These, in turn, cause the death of brain cells in the affected areas. Stroke is often thought of as a neurological disorder because of the many complications it causes.
- ❖ **Aneurysm**, is a bulge or weakness in the wall of an artery or vein. Aneurysms usually enlarge over time. Because of that, they have the potential to rupture and cause life-threatening bleeding. Aneurysms can occur in arteries in any location in the body. The most common sites include the abdominal aorta and the arteries at the base of the brain.

❖ **Peripheral arterial disease and claudication**, may be more familiar with claudication — pain in the arms or legs during exercise — than the term "peripheral arterial disease." Strictly speaking, claudication is a symptom of peripheral arterial disease. However, claudication is often referred to as a disease itself. Peripheral arterial disease is a disorder in which the arteries supplying blood to the limbs — usually the legs — become clogged or partially blocked. When this happens, the arms and legs are left with less blood than they need to keep up with demand. Claudication symptoms may then develop. When the obstruction is mild, may have such symptoms as pain in the legs during strenuous exercise. As the disease progresses and arteries become more obstructed, may have pain or cramping in the legs even when not active.

❖ **Vasculitis**, This is an inflammation of the blood vessels. It usually involves the arteries but may also affect veins and capillaries. The inflammation may damage the wall of the artery or vein and impair blood flow to the region of the body supplied by that vessel. Sometimes vasculitis occurs along with a generalized disorder, such as lupus or rheumatoid arthritis, but it may also occur on its own.

❖ **Venous incompetence**, This is a condition in which blood flows the wrong way in the veins. Veins have tiny valves that are designed to promote blood flow in a forward direction, back to the heart. But if such conditions as infection, inflammation, abnormal blood clotting, or even high-back pressure in pregnancy, the valves may become damaged and incompetent. That allows blood to flow backward and pool in the legs when sitting or standing. May develop such complications as prominent and painful varicose veins, skin changes, ulcers and swelling in the legs. When venous incompetence occurs in the arms, may experience pain and swelling in the arms and prominent veins.

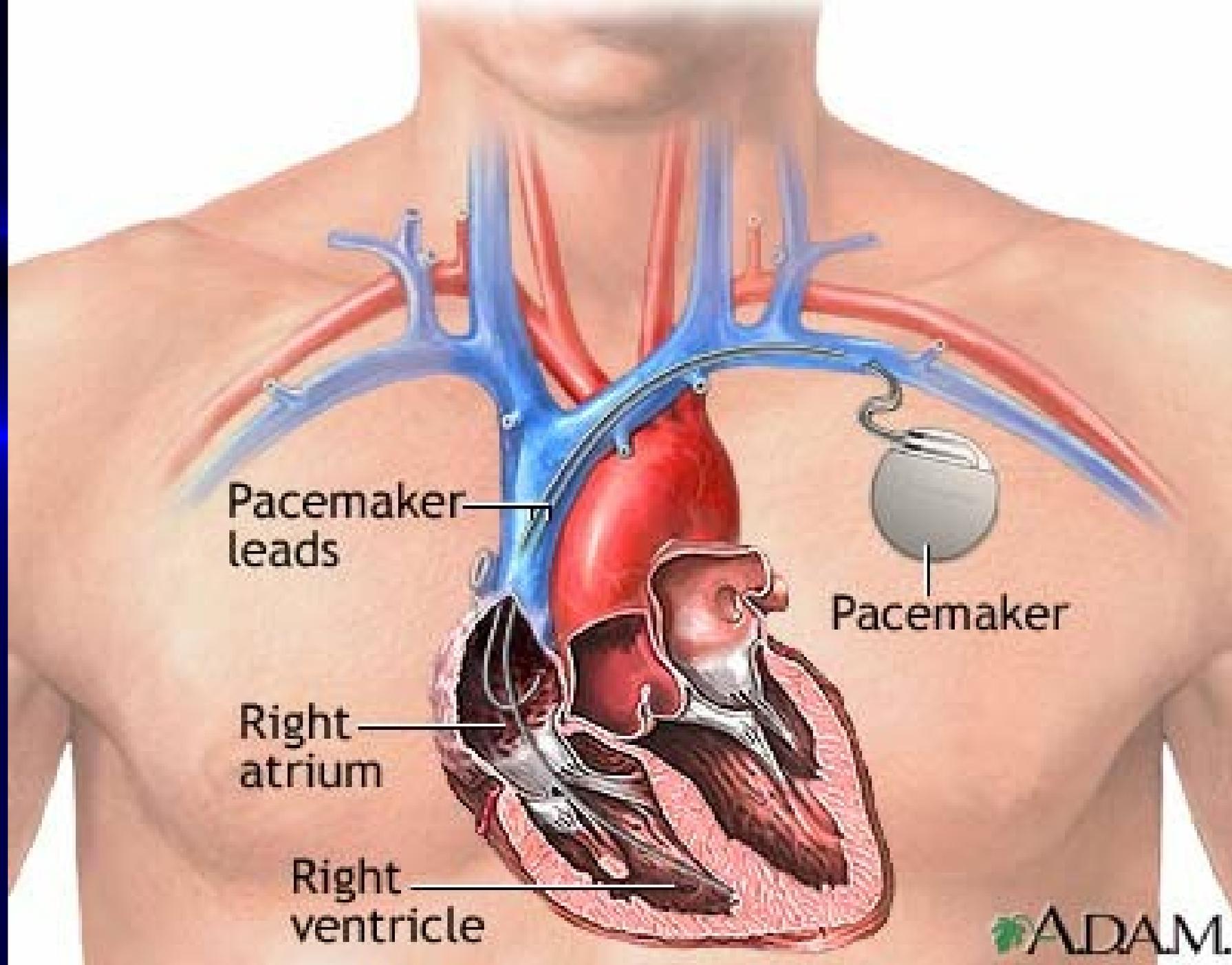
❖ **Venous thrombosis**, This is the formation of a blood clot (thrombus) in a vein. This condition may damage the vein and its valves. In addition, clots that break off and travel in the bloodstream can lodge in the lungs, a condition known as pulmonary embolism. In some cases, this type of clot can also cause a stroke. May be more familiar with deep vein thrombosis, in which a clot develops deep within a muscle, such as one in the calf.

- ❖ **Varicose veins**, This is a condition in which the veins become twisted and enlarged. The veins are usually located on the backs of the calves or on the inside of the legs, from the groin to the ankle. When valves in the veins don't function properly, blood can accumulate in the legs, causing the veins to bulge and twist. The veins appear blue because they contain less oxygen.
- ❖ **Lymphedema**, This is an obstruction of the lymphatic vessels. It results in an excessive buildup of fluid, which can cause swelling and pain. It can be caused by infections, trauma, tumors, surgery and radiation treatment. In rare cases, someone may be born with lymphedema.

## Arrhythmia / Dysrhythmia

**Heart block / Atrio ventricular block:** Failure of conduction of impulses through the A.V.Node.

Damage to the S.A.Node causes weak impulses failing to reach the ventricles. **Cardiac pacemaker** establishes normal rhythm. It is a small, battery-operated electronic device. It is inserted under the skin. It has leads that travel through a large vein to the heart, where the wires are anchored, which send the electrical impulses to the heart.



Pacemaker leads

Pacemaker

Right atrium

Right ventricle

**Flutter:** Rapid, **regular contraction** of atria or ventricle reaching upto 250/300 beats per minute.

**Fibrillation:** Rapid, random, **irregular contraction** reaching upto 350-400 beats per minute.

**Defibrillator** is applied to the chest wall to help in **cardioversion**.

**Defibrillation** is a technique used to counter the onset of **ventricular fibrillation**, a common cause of **cardiac arrest**. Defibrillation is part of an **advanced cardiac life support**. It applies a controlled electric shock.



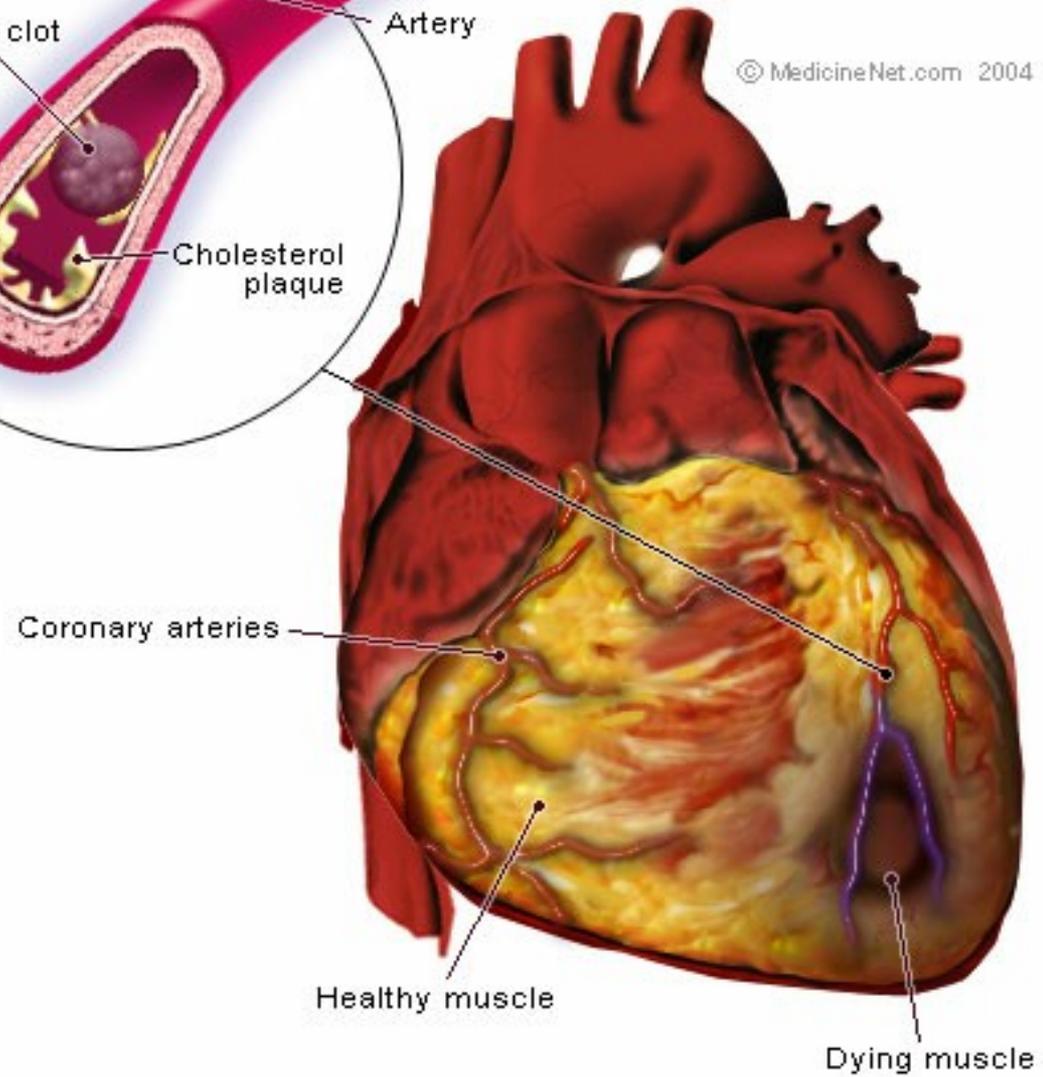
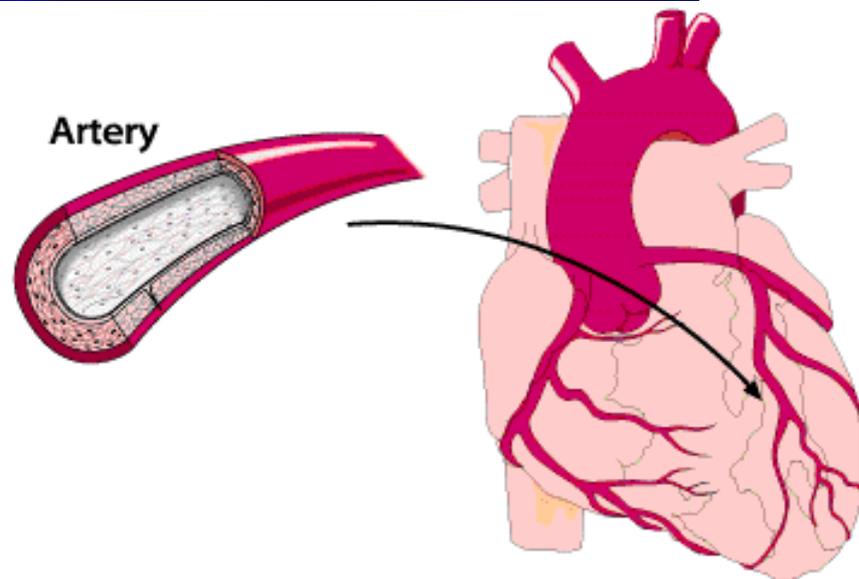
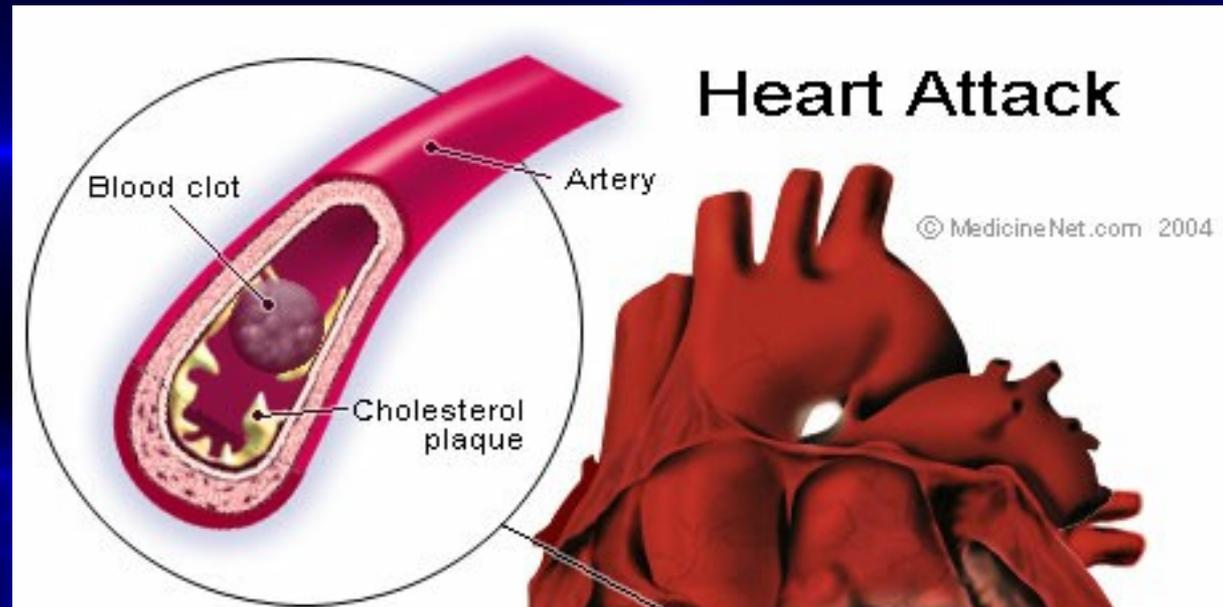
Defibrillator

**Cardiac Arrest:** Sudden stoppage of heart.

**Palpitation:** Uncomfortable sensation in the chest associated with arrhythmia. This causes

1. Premature atrial contraction (PAC)
2. Premature ventricular contraction (PVC).

# Myocardial Infarction / Heart Attack



# Angina Pectoris

## Types of chest pain



Hardening of the arteries, and the presence of a thrombus, or clot, in a blood vessel are the most common causes of obstruction.

Arteriosclerosis is responsible for most of the deaths resulting from heart attacks. Spasms of the coronary arteries can also result in a heart attack.

# CHOICES IN HEART SCANS

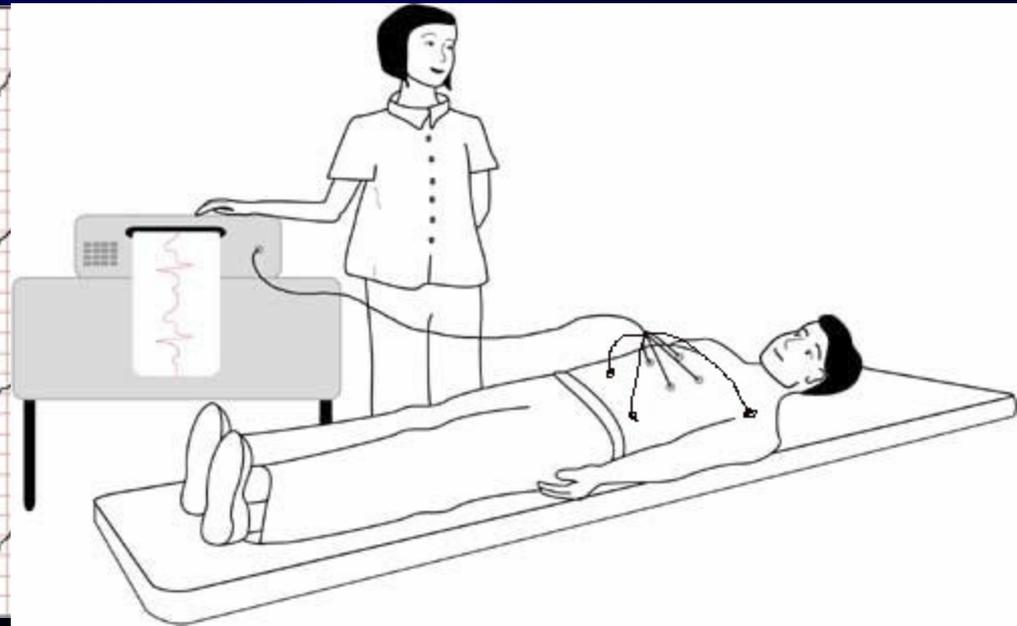
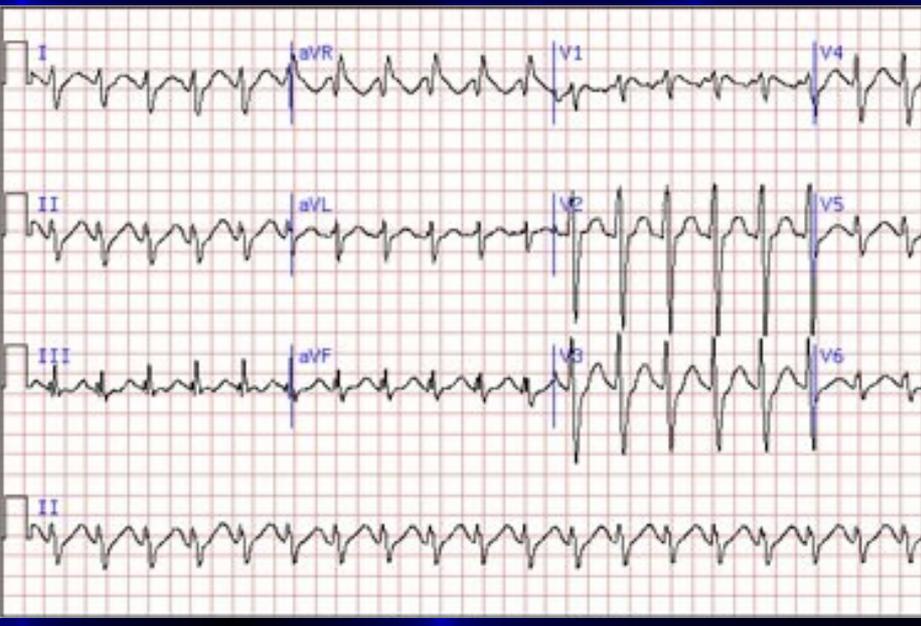
- ❖ Electrocardiogram (ECG)
- ❖ Nuclear stress testing
- ❖ Echocardiogram (ECHO)
- ❖ Coronary angiogram
- ❖ CT scan
- ❖ PET/CT scan
- ❖ Magnetic resonance imaging (MRI)

# ELECTROCARDIOGRAM (ECG)

- **How it works:** This oldest and most basic heart scan records the electrical impulses that regulate the heart's pumping action. It may seem unsophisticated, but any deviation from the normal rhythm pattern can alert doctors to the likelihood of damaged heart tissue and reduced blood flow.
- **Limitations:** While it can indicate signs of trouble, an EKG provides no visual map of the heart and cannot identify precisely what ails the organ or where in the heart the problem lies.

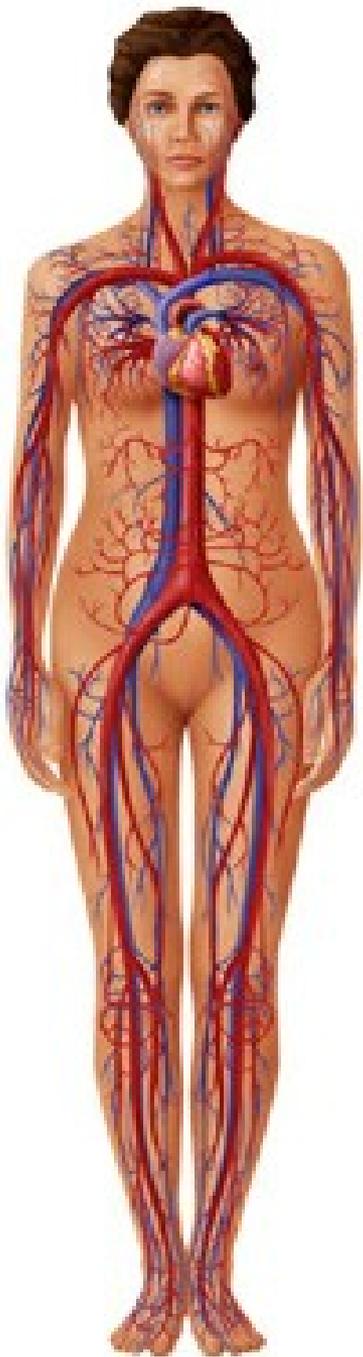
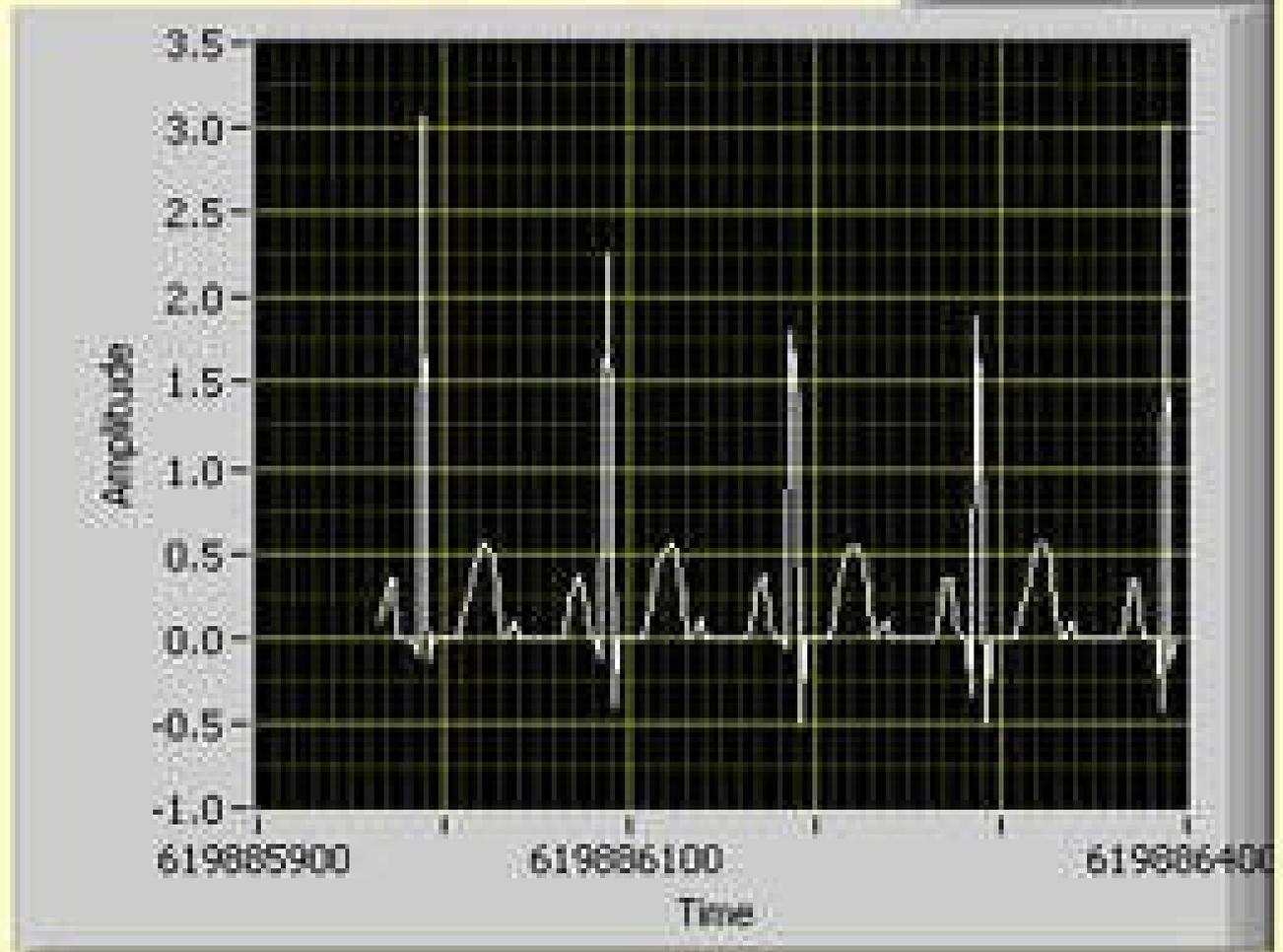
# Electrocardiography (EKG / ECG)

Detects heart abnormalities, disease and damage by measuring the heart's rhythms and electrical impulses.



# Heartbeat

Plot 0

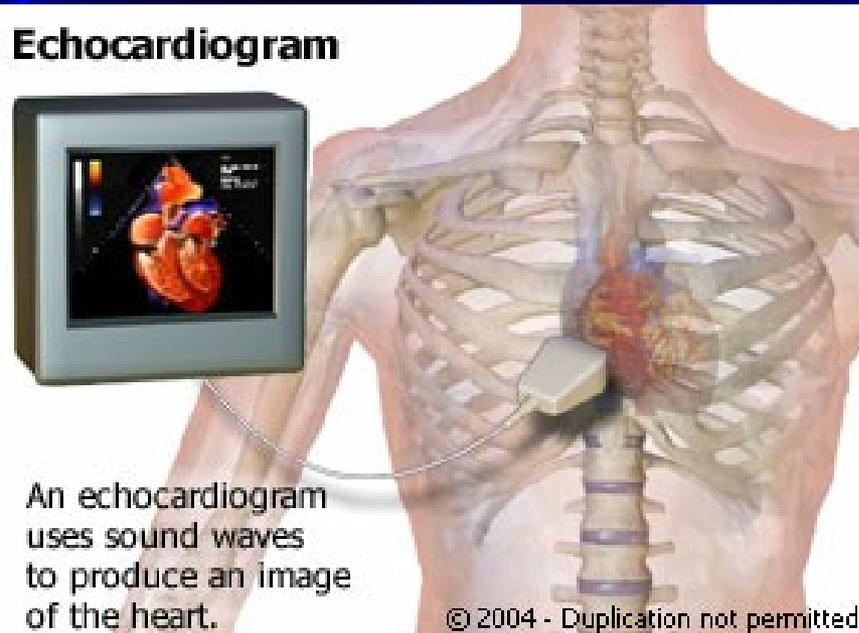


**ELECTROCARDIOGRAM**

# Echocardiography

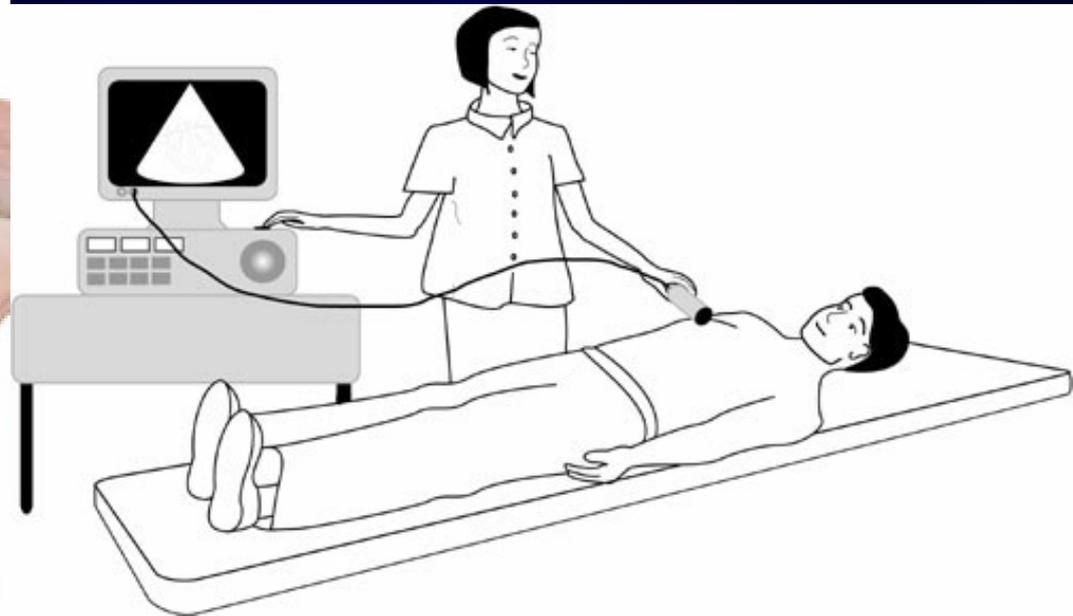
The image shows the motion pattern and structure of the four heart **valves**, revealing any potential leakage (**regurgitation**) or narrowing (**stenosis**). During this test, a **Doppler ultrasound** may be done to evaluate cardiac blood flow.

Echocardiogram

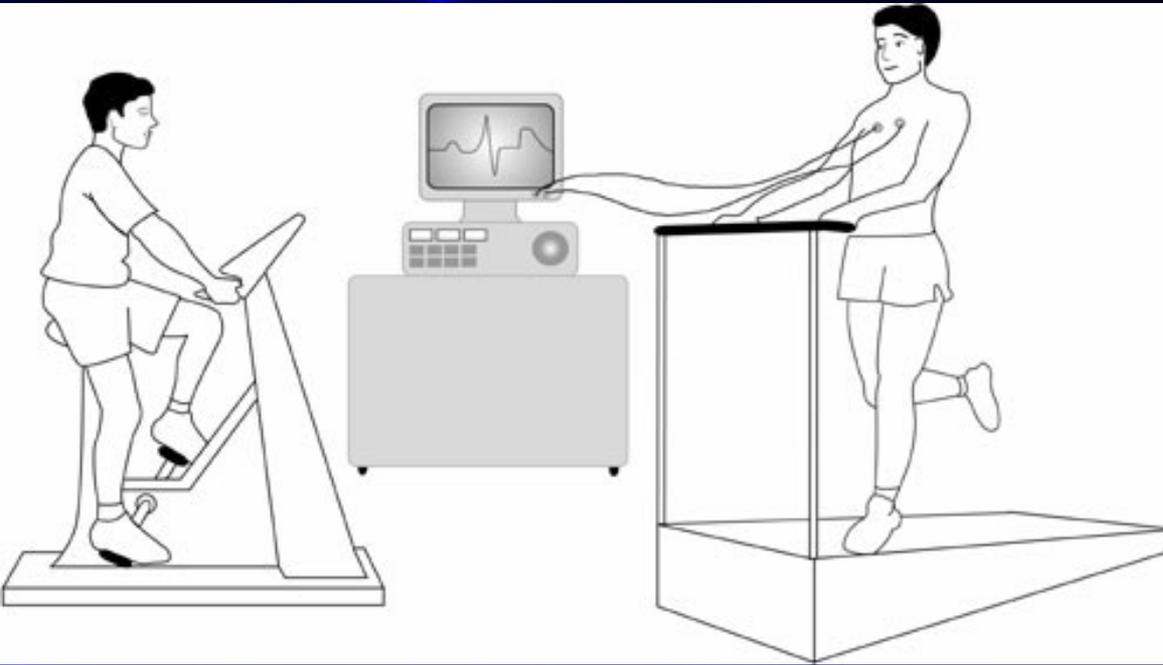


An echocardiogram uses sound waves to produce an image of the heart.

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## Stress Test/ Exercise tolerance test (ETT) / treadmill test



It can assess the heart's reaction under physical stress.

During an exercise ST, an EKG is performed while the patient exercises in a controlled manner on a treadmill or stationary bicycle at varied speeds and elevations. During a pharmacological ST, a medication (e.g., *dobutamine*) is given to the patient, which causes the heart to react as if it were under the physical stress of exercise, though he is actually at rest.

# NUCLEAR STRESS TESTING

- **How it works:** Doctors inject a radioactive substance into the blood, then use gamma-ray cameras to see how the blood moves through the heart. The test shows how well the heart is doing at keeping itself saturated with oxygen-rich blood. The test is often done twice, to check cardiac performance at rest and under physical stress.
- **Limitations:** Carrying out two scans can take as long as five hours. The test also exposes the patient to small amounts of radiation.

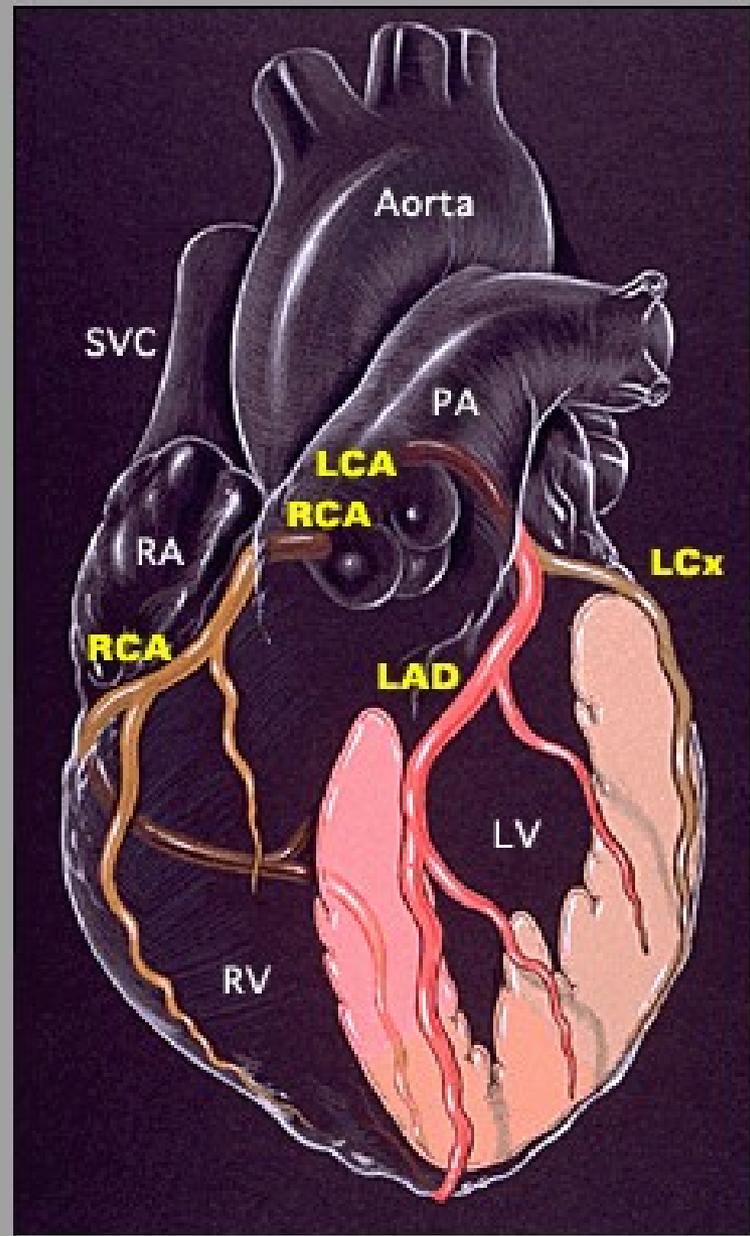
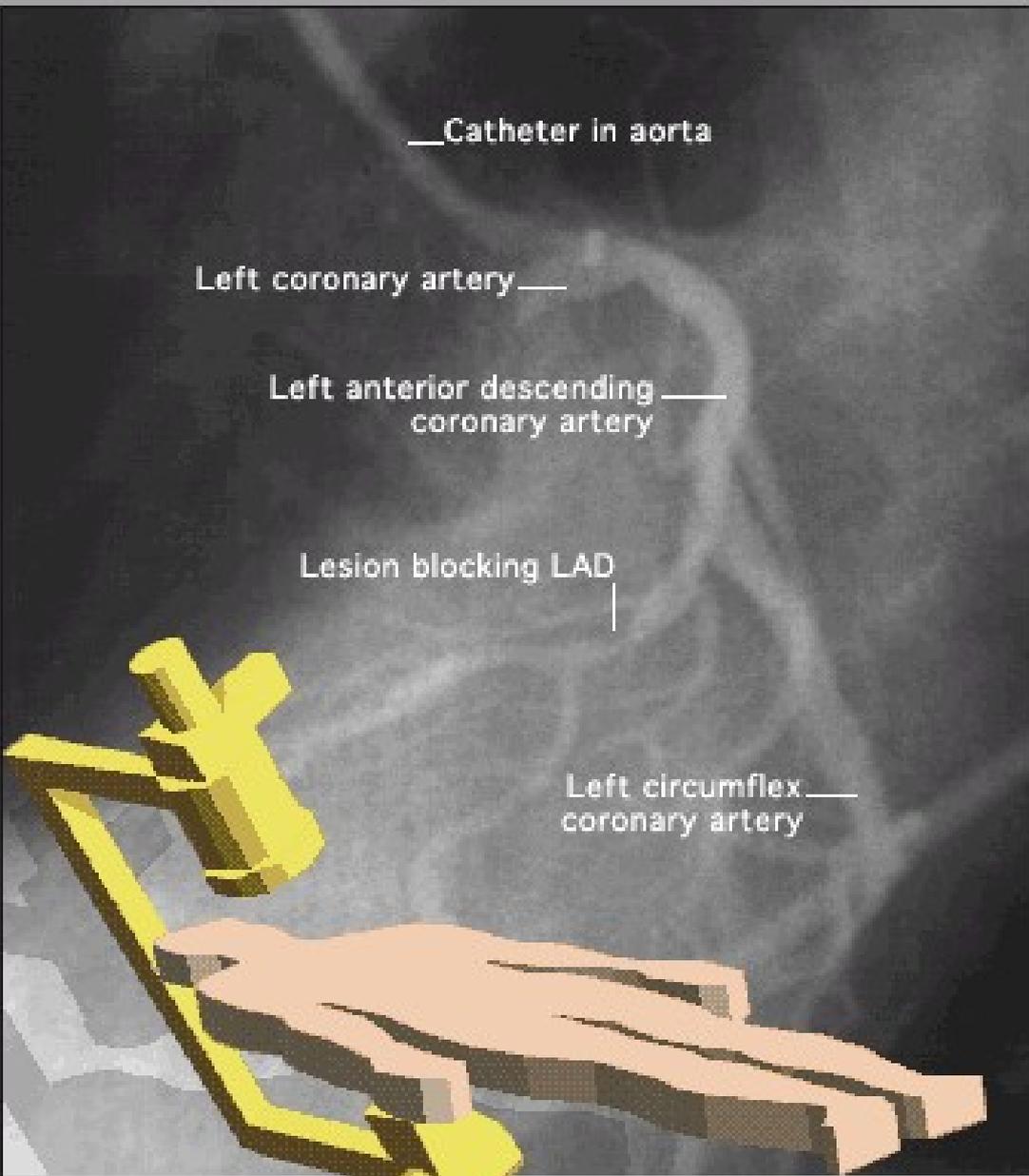
# ECHOCARDIOGRAM (ECHO)

- **How it works:** Harmless ultrasound waves, similar to the ones used to take sonograms of a fetus, are directed at the chest and bounce off the heart's walls and valves. A computer analyzes these rebounding waves and calculates the size, shape and movement of structures inside the heart. Doctors often take two echoes – one of the heart at rest and another of the heart under stress (e.g., after the patient exercises on the treadmill or after technicians have injected a drug to make the heart race). Comparison of the two images helps pinpoint abnormal valves or areas that are not receiving enough blood.
- **Limitations:** Ultrasound does not produce images with high enough resolution to see heart arteries and can highlight only the biggest changes in structures like the heart chambers.

# CORONARY ANGIOGRAM

- **How it works:** This procedure is the gold standard for viewing the arteries that nourish the heart. Doctors insert a catheter through an artery in the leg and shake it up toward the heart. They then send a special dye through the tube that highlights the arteries under x-rays and exposes any blockages.
- **Limitations:** Because they are invasive angiograms have some risks: catheters can tear artery walls, requiring surgical repair. (In 1% of cases, serious complications including death, may occur.) Afterward, patients need to lie still for four to six hours until the blood vessel in the leg seals.

# Angiography



# CT SCAN

- **How it works:** This test combines rapid X-ray scanning with multiple computed topography (CT) to produce the most detailed images available of the heart's arteries without surgery. Patients receive an injection of contrast dye to highlight the blood vessels and x-rays create images of the heart in slices. A computer assembles the slices into an image of the heart that reveals calcium and fat-filled plaques lodged in the arteries.
- **Limitations:** CT scans involve radiation exposure, a particular concern for children. Those who are overweight or have stents or extensive calcium deposits won't generate useful images, since fat can distort x-rays and the beams cannot penetrate metal or calcium.

# PET/CT SCAN

- **How it works:** A hybrid of position emission tomography and CT, this scan provides structural and functional information about the heart in a single scan. Doctors use the CT to physically locate narrowed regions along arteries, then apply PET to isolate parts of the heart muscles, such as the areas circled, that are deprived of blood flow as a result.
- **Limitations:** PET technology is expensive, and the hybrid machines are not widely available. The test also involves some radiation exposure.

# MAGNETIC RESONANCE IMAGING (MRI)

- **How it works:** Powerful magnets create a field that sets the nuclei of atoms in heart cells vibrating. The oscillating atoms emit radio signals, which are converted by computer into either still or moving 3-D images. The arrow at left points to a plaque filled spot in the artery; the scan also reveals the layer of fat that envelops most hearts.
- **Limitations:** Because of the intense magnetic field, patients with pacemakers, stents or other metal implants cannot get an MRI. These scan cannot pick up calcium deposits, which could signal dangerously narrowed vessels.

- Coronary arteries are only a small part of the heart. MRI is better at telling how well the heart is pumping how healthy its walls are and what shape the valves and chambers are in. MRI has the potential to do everything.
- MRI is also ideal for scanning children with congenital heart problems, since repeated radiation exposure in youngsters leads to an increased risk of developing cancer as adults. But again there are drawbacks. MRI scans are much more expensive than CT scans, and generating and interpreting them require lots of training.

- Echocardiogram machines are getting smaller and smaller, and their output is increasingly being digitized, which allows doctors to calculate more accurately the ability of the heart to function. And new radioactive markers are making nuclear perfusion scans shorter and more precise.
- The further, however, may belong to whoever can figure out how to make all these imaging technologies work together. One approach combines the anatomical accuracy of CT imaging with the functional information provided by a type of nuclear scan called positron-emission tomography (PET).

- Still in its early days in the clinic, PET/CT could help doctors see how much of the cardiac muscle is still alive after a heart attack and whether a bypass operation, balloon angioplasty or stent surgery would help damaged areas recover.
- Not all plaques that form inside a coronary artery's walls are dangerous. Some appear to be stable and do not grow much, whereas others contain an explosive combination of hardened fat and inflammatory proteins that make them likely to burst, triggering a heart attack. Neither CT nor MRI scans can reliably distinguish between the two sorts of lesions.

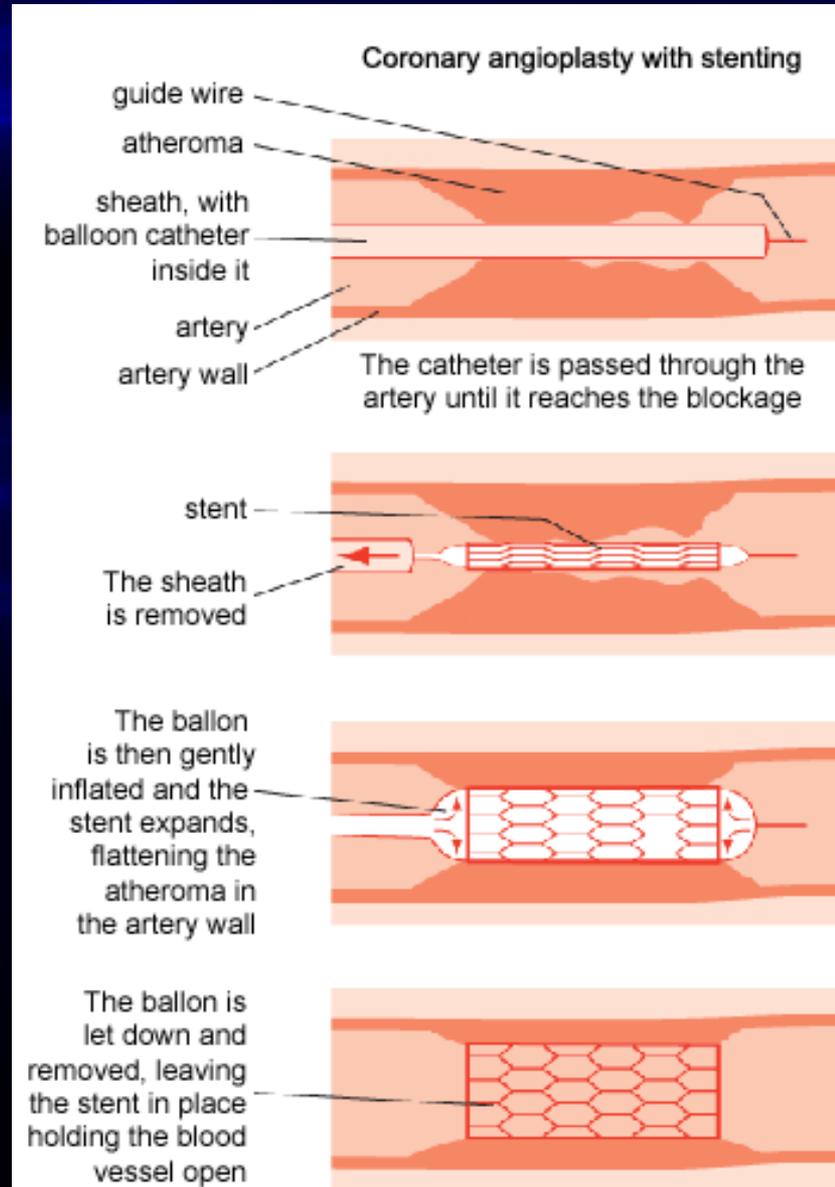
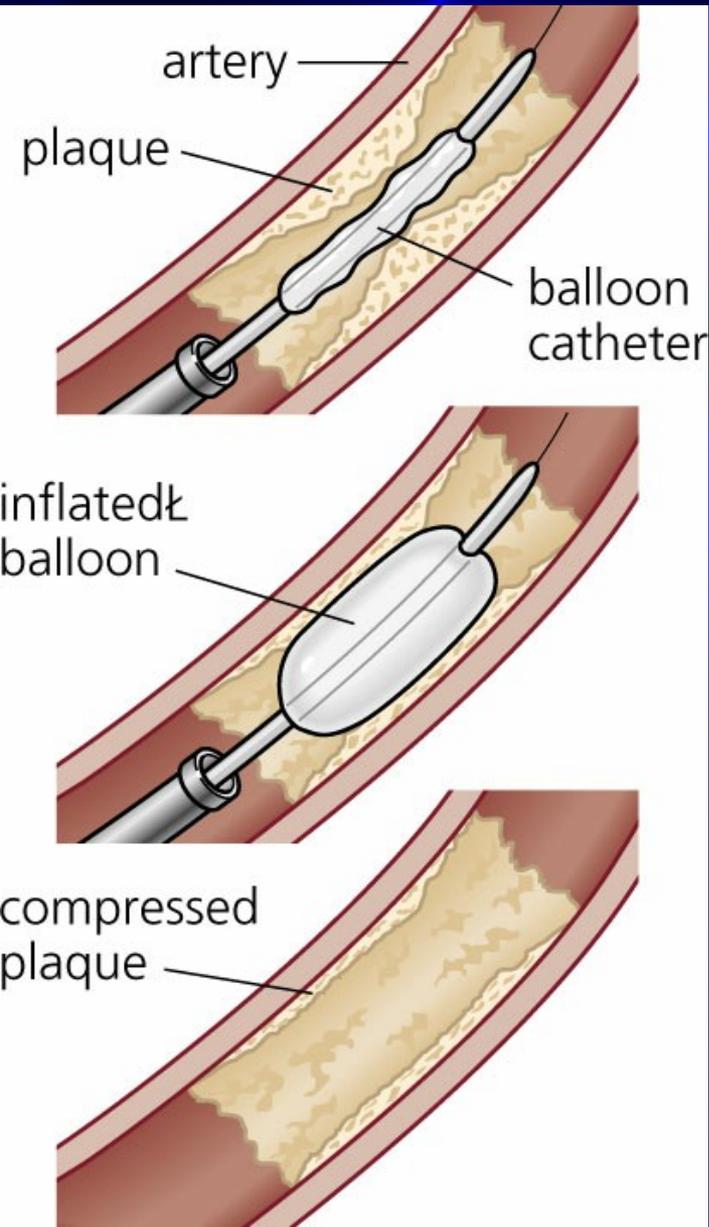
- Researchers are developing compounds that are chemically attracted to the inflammatory components of an unstable plaque with the hope of someday tagging trouble spots that need to be treated. But that could take a while.
- There is a lot of evidence that lowering cholesterol levels in those patients with moderate arterial blockage greatly reduces the risk of suffering a heart attack or stroke. So a growing number of cardiologists are using the new cardiac scans to determine which of their otherwise asymptomatic patients need more intense medical treatment with statins and other drugs.

Mild coronary artery disease, then, in addition to trying to get the LDL cholesterol level under 70 mg/dL, he or she is probably going to put on a daily aspirin regimen and make sure the Risk factors for heart disease

- Family history.
- High blood pressure.
- Age 55 or older.
- Low HDL or smoking

# Balloon angioplasty

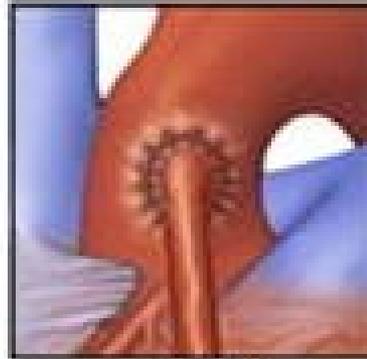
## Percutaneous transluminal coronary angioplasty (PTCA)



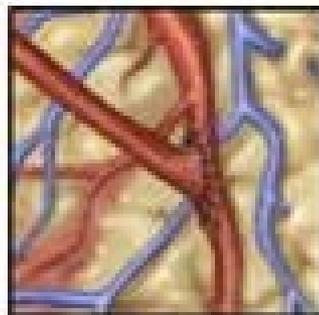
# Coronary artery bypass graft (CABG)

## Coronary Artery Bypass Graft

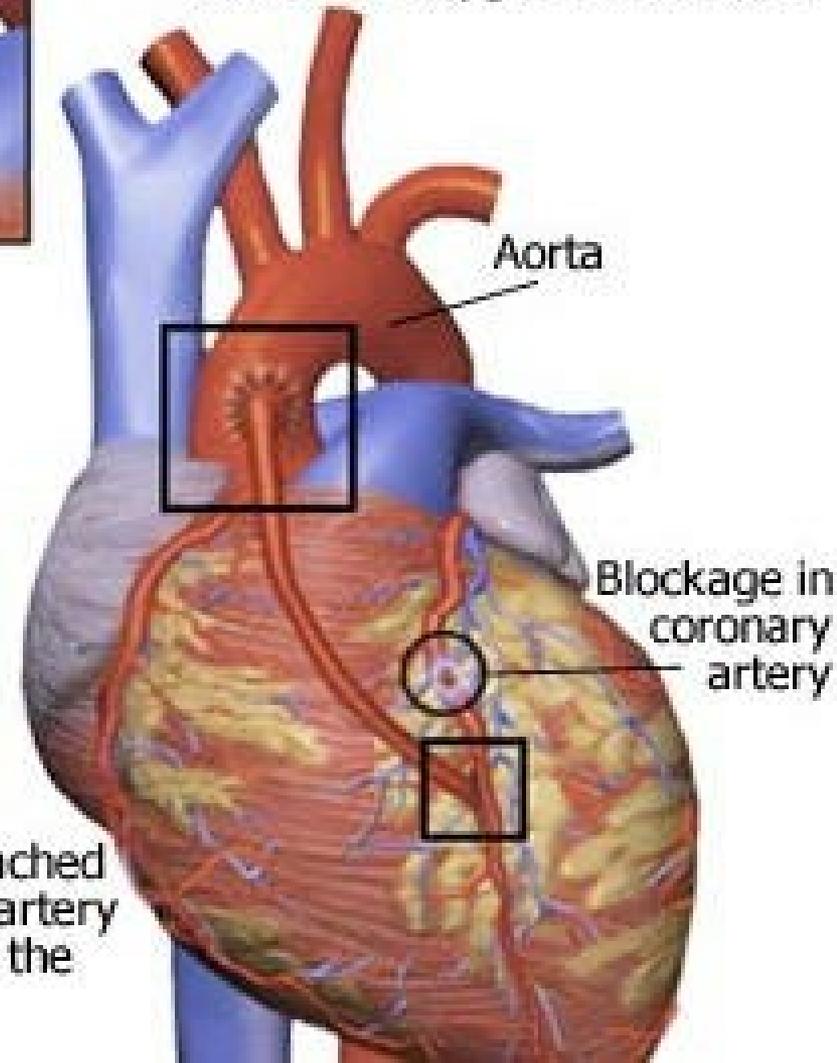
A procedure to bypass a blocked section of a coronary artery and to deliver oxygen to the heart



One end of the blood vessel is attached to the aorta

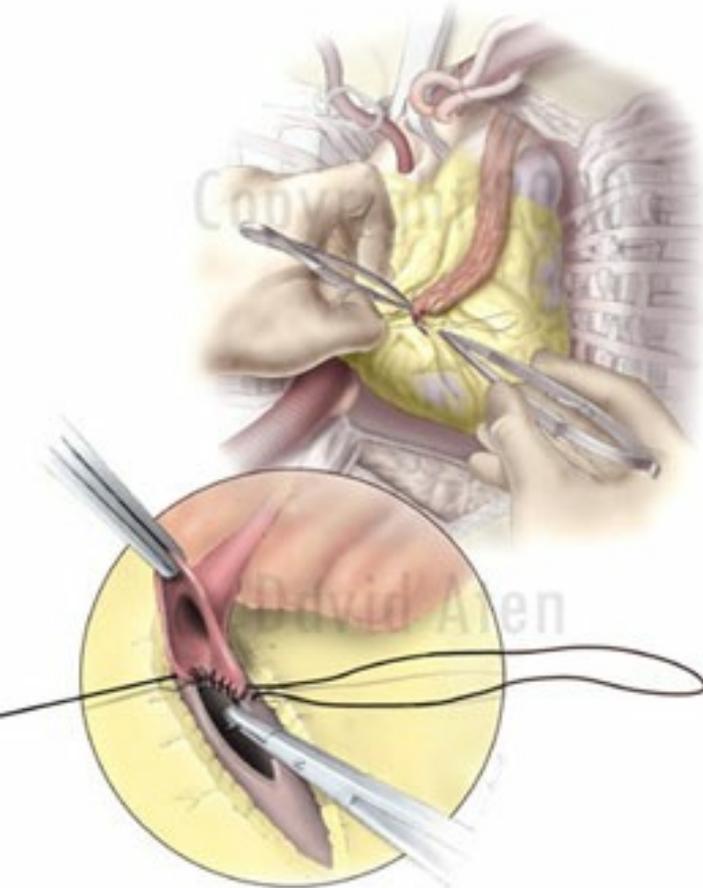


Other end is attached to the coronary artery at a point below the blockage

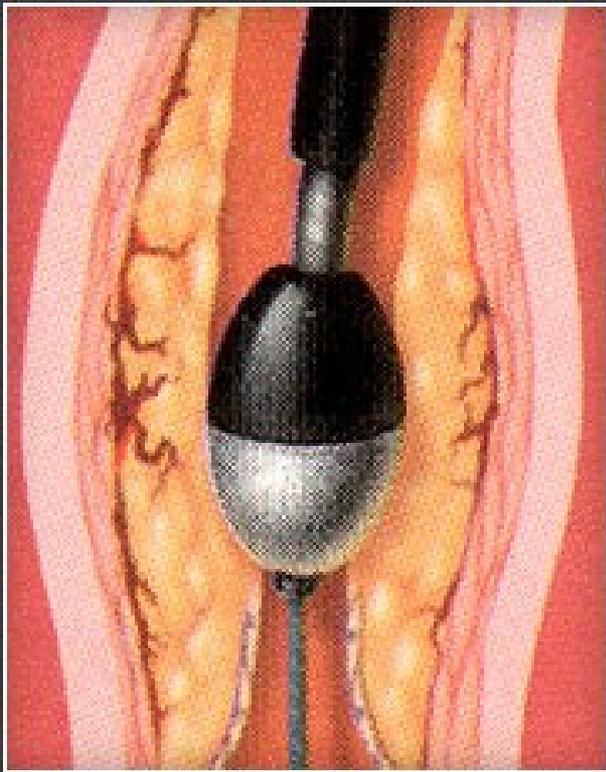


Aorta

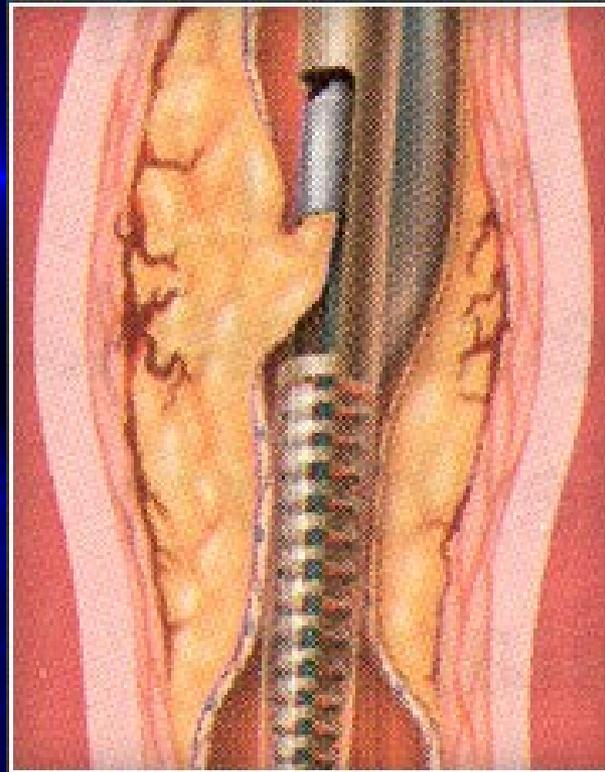
Blockage in coronary artery



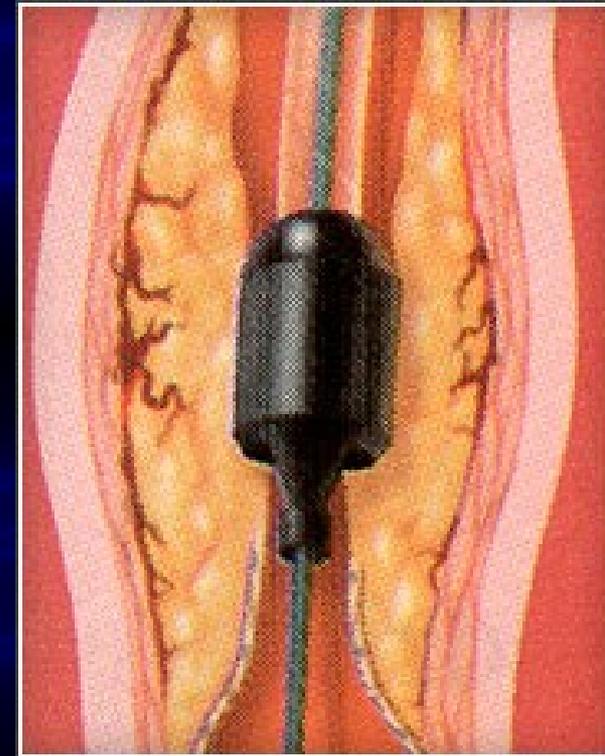
# ATHERECTOMY



Rotational  
Atherectomy



Directional  
Coronary  
Atherectomy



Extraction  
Atherectomy

# RISK FACTORS

which predispose to various forms of cardiovascular disease

- ❖ Age
- ❖ Absence of key nutritional elements, such as polyphenol antioxidants
- ❖ Diabetes mellitus
- ❖ Hypercholesterolemia (elevated cholesterol levels) and abnormal lipoprotein particle profile (cholesterol subtypes)
- ❖ Tobacco smoking
- ❖ Higher fibrinogen and PAI-1 blood concentrations

- ❖ Elevated homocysteine, or even upper half of normal
- ❖ Elevated blood levels of asymmetric dimethylarginine
- ❖ High blood pressure
- ❖ Exposure to high levels of environmental noise
- ❖ Obesity, especially central or male-type obesity; apart from being linked to diabetes, this form of obesity independently increases cardiovascular risk, presumably by inducing an inflammatory and procoagulant state
- ❖ Genetic factors/Family history of cardiovascular disease
- ❖ Physical inactivity/ Sedentary lifestyle
- ❖ Depression

- Men have a higher rate of cardiovascular disease than women, it is also the number one health problem for women in industrialized countries.
- After menopause, the risk for women approaches that of men.
- Hormone replacement therapy alleviates a number of post-menopausal problems, but appears to increase the risk of cardiovascular disease.

# PREVENTION

- Attempts to prevent cardiovascular disease take the form of modifying risk factors.
- Some, such as sex (male or female), age, and family history, cannot be modified.
- Smoking cessation (or abstinence) is one of the most effective and easily modifiable changes.
- Regular cardiovascular exercise (aerobic exercise) complements the healthful eating habits.

- Sometimes, the combination of diet and exercise will improve lipoprotein (cholesterol) levels; if not, a physician may prescribe "cholesterol-lowering" drugs like the statins.
- These medications have additional protective benefits aside from their lipoprotein profile improvement.
- Aspirin may also be prescribed, as it has been shown to decrease the clot formation that may lead to myocardial infarctions and strokes; it is routinely prescribed for patients with one or more cardiovascular risk factors.

- One little known or discussed, but powerful way to almost eliminate risk of cardiovascular disease is keep the total cholesterol below 150.
- In the heart study, those with total cholesterol below 150 only very rarely got coronary heart disease.
- Eating oily fish at least twice a week may help reduce the risk of sudden death and arrhythmias.
- Olive oil is said to have the greatest benefits.
- Studies of individual heart cells showed that the fatty acids blocked excessive sodium and calcium currents in the heart, which could otherwise cause dangerous, unpredictable changes in its rhythm.

# TREATMENT

- Treatment of cardiovascular disease depends on the specific form of the disease in each patient, but effective treatment always includes preventive lifestyle changes discussed above.
- Medications, such as blood pressure reducing medications, aspirin and the statin cholesterol-lowering drugs may be helpful.
- In some circumstances, surgery or angioplasty may be warranted to reopen, repair, or replace damaged blood vessels.

# TREATING HEART DISEASES

Explore heart disease treatments for specific types of heart disease.

- ❖ Cardiovascular diseases
- ❖ Arrhythmias
- ❖ Heart failure
- ❖ Pericardial disorders
- ❖ Heart valve disease
- ❖ Congenital heart disease

# CARDIOVASCULAR DISEASES

## Types of heart disease

- ❖ Arteriosclerosis/  
Atherosclerosis
- ❖ Chest pain
- ❖ Coronary artery  
disease
- ❖ Heart attack

## Types of circulatory disorders

- ❖ Aortic aneurysm
- ❖ Aortic dissection
- ❖ Claudication: When  
circulation problems cause  
leg pain
- ❖ Lymphedema
- ❖ Peripheral arterial disease
- ❖ Raynaud's disease
- ❖ Takayasu's arteritis
- ❖ Varicose veins

# ALLOPATHIC TREATMENT

- ✓ Angiotensin II receptor blockers
- ✓ Angiotensin-converting enzyme (ACE) inhibitors
- ✓ Beta blockers
- ✓ Cholesterol medications: Consider the options
- ✓ Nitrates— Oral (Systemic)
- ✓ Nitrates— Sublingual, Chewable, or Buccal (Systemic)
- ✓ Nitrates— Topical (Systemic)
- ✓ Statins: Are these cholesterol-lowering drugs right?

# **SURGICAL PROCEDURES**

- ✓ Coronary angioplasty and stenting: Opening clogged arteries
- ✓ Coronary artery bypass surgery

## **CARDIAC REHABILITATION**

- ✓ Cardiac rehabilitation: Building a better life after heart disease

# ARRHYTHMIAS

## Types of arrhythmias (rhythm disorders)

- ❖ Atrial fibrillation
- ❖ Bundle branch block
- ❖ Heart arrhythmias
- ❖ Long QT syndrome

# DEVICE TREATMENTS

- ✓ Implantable cardioverter-defibrillator: After the ICD is implanted
- ✓ Implantable cardioverter-defibrillators: Controlling a chaotic heart
- ✓ Pacemakers: Generating regular heartbeats

# HEART FAILURE

## Types of heart failure

- ❖ Cardiomyopathy
- ❖ Heart failure
- ❖ Left ventricular hypertrophy
- ❖ Myocarditis
- ❖ Pulmonary edema

# ALLOPATHIC TREATMENT

- ✓ Angiotensin II receptor blockers
- ✓ Angiotensin-converting enzyme (ACE) inhibitors
- ✓ Beta blockers
- ✓ Digitalis Medicines (Systemic)
- ✓ Diuretics

# TRANSPLANTATION

- ✓ Heart transplant: A treatment for end-stage heart failure
- ✓ Organ transplant: Replacing diseased organs with healthy ones

## DEVICES

- ✓ Biventricular pacemaker: Cardiac resynchronization therapy for heart failure
- ✓ Heart failure: Heart pumps help keep the beat

## TOOL

- ✓ Biventricular pacing

# PERICARDIAL DISORDERS

## Understanding pericarditis

- ❖ Dressler's syndrome
- ❖ Pericarditis

# HEART VALVE DISEASE

## Types of heart valve disease

- ❖ Aortic valve stenosis
- ❖ Endocarditis
- ❖ Mitral valve prolapse
- ❖ Mitral valve regurgitation
- ❖ Mitral valve stenosis
- ❖ Pulmonary valve stenosis

# CONGENITAL HEART DISEASE

## Congenital heart disease causes and treatments

- ❖ Atrial septal defect (ASD)
- ❖ Atrioventricular canal defect
- ❖ Coarctation of the aorta
- ❖ Congenital heart defects: When the baby's born with a heart malformation
- ❖ Ebstein's anomaly
- ❖ Hypoplastic left heart syndrome
- ❖ Patent ductus arteriosus (PDA)

# Congenital heart disease causes and treatments

- ❖ Patent foramen ovale
- ❖ Tetralogy of Fallot
- ❖ Transposition of the great arteries
- ❖ Tricuspid atresia
- ❖ Truncus arteriosus

## **TOOL**

Common types of congenital heart defects

# LIVING AND COPING WITH HEART DISEASE

- ❖ Strategies to keep heart disease at bay.
- ❖ Heart disease diet and weight loss
- ❖ Supplements for heart disease
- ❖ Exercise and heart disease
- ❖ Smoking and heart disease
- ❖ Stress relief
- ❖ Heart disease first aid

# Strategies to keep heart disease at bay

## Choose heart-healthy foods

- ❖ Alcohol and the health: Weighing the pros and cons
- ❖ Heart-healthy eating to help prevent cardiovascular disease
- ❖ Mediterranean diet for heart health
- ❖ Menus for heart-healthy eating

## Weight-loss strategies

### Tool

- ❖ BMI calculator

# Supplements for heart disease

## Antioxidants

- ❖ Ascorbic Acid (Vitamin C) (Systemic)
- ❖ Beta-carotene— (Systemic)
- ❖ Coenzyme Q10
- ❖ Lycopene

## B-vitamins

- ❖ Folic Acid (Vitamin B 9) (Systemic)
- ❖ Niacin (Vitamin B3, Nicotinic acid), Niacinamide
- ❖ Pyridoxine (Vitamin B 6) (Systemic)
- ❖ Vitamin B12 (Systemic)

## Fish oil and garlic

- ❖ Garlic (*Allium sativum* L.)
- ❖ Omega-3 fatty acids, fish oil, alpha-linolenic acid

# INTEGRATED YOGA MODULE FOR HEART DISEASES

## Loosening Exercises

- Loosening of fingers
- Shoulder rotation
- Drill walking
- **Instant relaxation technique (IRT)**

## Breathing practices

- Hands stretch breathing
- Ankle stretch breathing
- Rabbit breathing
- Straight leg raise breathing (alternating)
- Side bending, each
- **Quick relaxation technique (QRT)**

## Yogasanas

### Standing

- Ardhakati cakrasana
- Garudasana
- Bhujangasana
- Vakrasana
- Gomukhasana
- **Deep relaxation technique (DRT)**

➤ **Acute attack - chair breathing**

➤ **Vamanadhouti + DRT – Once a week**

➤ **Laghu Sankapraksalana + DRT - Daily**

## Pranayama

- Nadisuddi pranayama
- Sitali pranayama
- Bhramari pranayama

## Meditation

- Nadanusandhana
- OM-Dhyana (meditation)

# SPECIFIC PRACTICE

- ❖ Millions of people in the world suffer from the diseases of the heart and blood vessels.
- ❖ The heart, which is muscular pump, keeps the blood circulation of blood going.
- ❖ But when there is a break down of this complicated mechanism, blood supply to a part of the body may be affected leading to what is known as heart attack.
- ❖ But with yoga the cardiovascular diseases can be cured. Diseases that can be cured are:
  - Arteriosclerosis - hardening of arteries
  - Coronary Thrombosis - sudden blocking of one of the arteries.

- ❖ Yoga helps coping with this stress so that do not need to depend on smoking or eating unhealthy food.
- ❖ It also helps to find contentment from within.
- ❖ Smoking should be completely stopped as it constricts the arteries.

For daily practice :

- ❖ Keep self relaxed and free from anxiety , nervousness, tension and restlessness.
- ❖ Meditation - has been scientifically proven to be beneficial for hypertensive people.
- ❖ Ujjayi Pranayama - can be done while lying for about 3-4 minutes, if the blood pressure rises very high.
- ❖ Nadi Shodak Pranayama - It can be done 10 times.

- ❖ **General considerations:** Consultation with patient's doctor is advisable because the limitation may differ substantially according to various heart diseases and their stages. Some heart abnormalities require no or little restraint.
- ❖ **Contraindications:** No practices with internal breath retention. No physically demanding physical exercises exceeding trainee's tolerance. Practices like Agnisara Dhauti or Shankha Prakshalana may be too risky even in persons with heart problems whose condition is fairly good.
- ❖ **Recommendations:** Patients shortly after myocardial infarction are advised to practice Savasana, full yoga breath and later some easy Pavanmuktasana, in prone position.

## Recommended Asana :

- ❖ Suryanamaskara (Sun salutation) - activates the whole body.
- ❖ Pavanmuktasana (Relieving the flatus) - wind reliever, corrects malfunctioning of the abdomen. Make 4-6 rounds.
- ❖ Uttanpadasana (Raising the legs) - Helps reduce fat.
- ❖ Santulanasana - normalizes blood circulation.
- ❖ Shavasana (Corpse pose) - should be done twice or thrice daily as it normalizes the blood pressure.

WHAT MATTERS MOST  
IS HOW YOU SEE YOURSELF.



***THANK  
YOU***