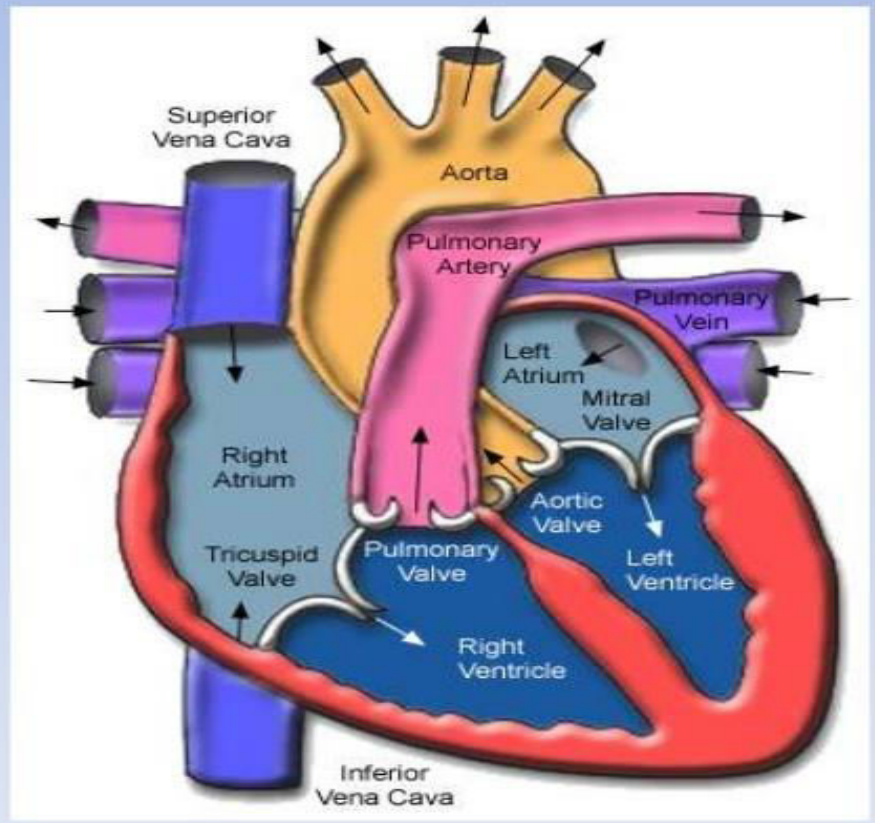
CARDIOMYOPATHY

INTRODUCTION

- Cardiomyopathy is a group of diseases that affect the heart muscle. Cardiomyopathy is a disease of the heart muscle that makes it harder for your heart to pump blood to the rest of your body. Cardiomyopathy can lead to heart failure.

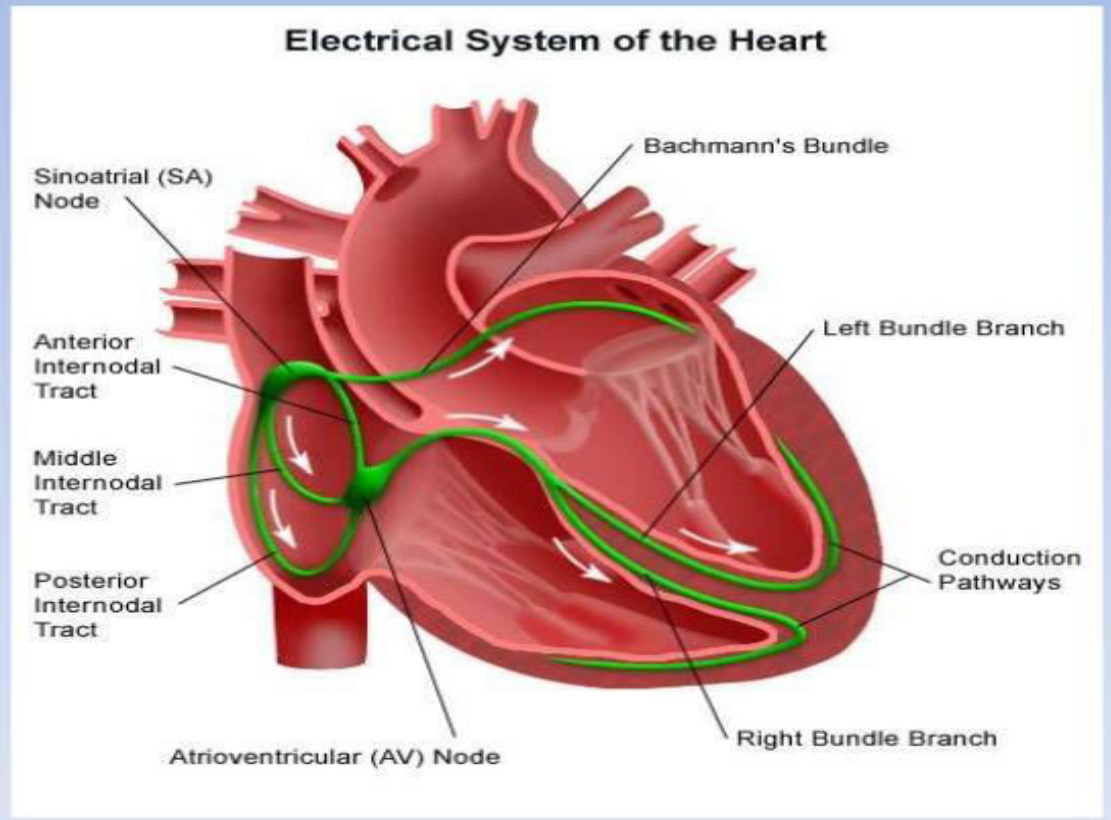
Conti….

Gross Anatomy



Conti….

Conduction system of the Heart



DEFINITION

- Cardiomyopathy is a type of heart disease in which the heart muscle is abnormal enlarge thickened and stiffened as a result the heart muscle ability to pump blood is usually impaired.

- AHA(American Heart Association)

INCIDENCE

- Cardiomyopathy often goes undiagnosed, so the numbers can vary. As many as 1 of 500 adults may have this condition. Males and females of all ages and races can have cardiomyopathy. Dilated cardiomyopathy is more common in blacks than in whites and in males than in females.

Conti…

- Hypertrophic cardiomyopathy is thought to be the most common inherited or genetic heart disease. While this type of cardiomyopathy occurs at many ages, in children and young adults with this condition there may be no symptoms, yet they are at high risk of sudden cardiac death.

RISK FACTORS

- Family history of cardiomyopathy, heart failure and sudden cardiac arrest
- Long-term high blood pressure
- Conditions that affect the heart, including a past heart attack, coronary artery disease or an infection in the heart. Obesity, which makes the heart work harder
- Long-term alcohol abuse

Conti….

- Obesity, which makes the heart work harder
- Long-term alcohol abuse

- Illicit drug use, such as cocaine, amphetamines and anabolic steroids
- Certain chemotherapy drugs and radiation therapy for cancer.

Conti….

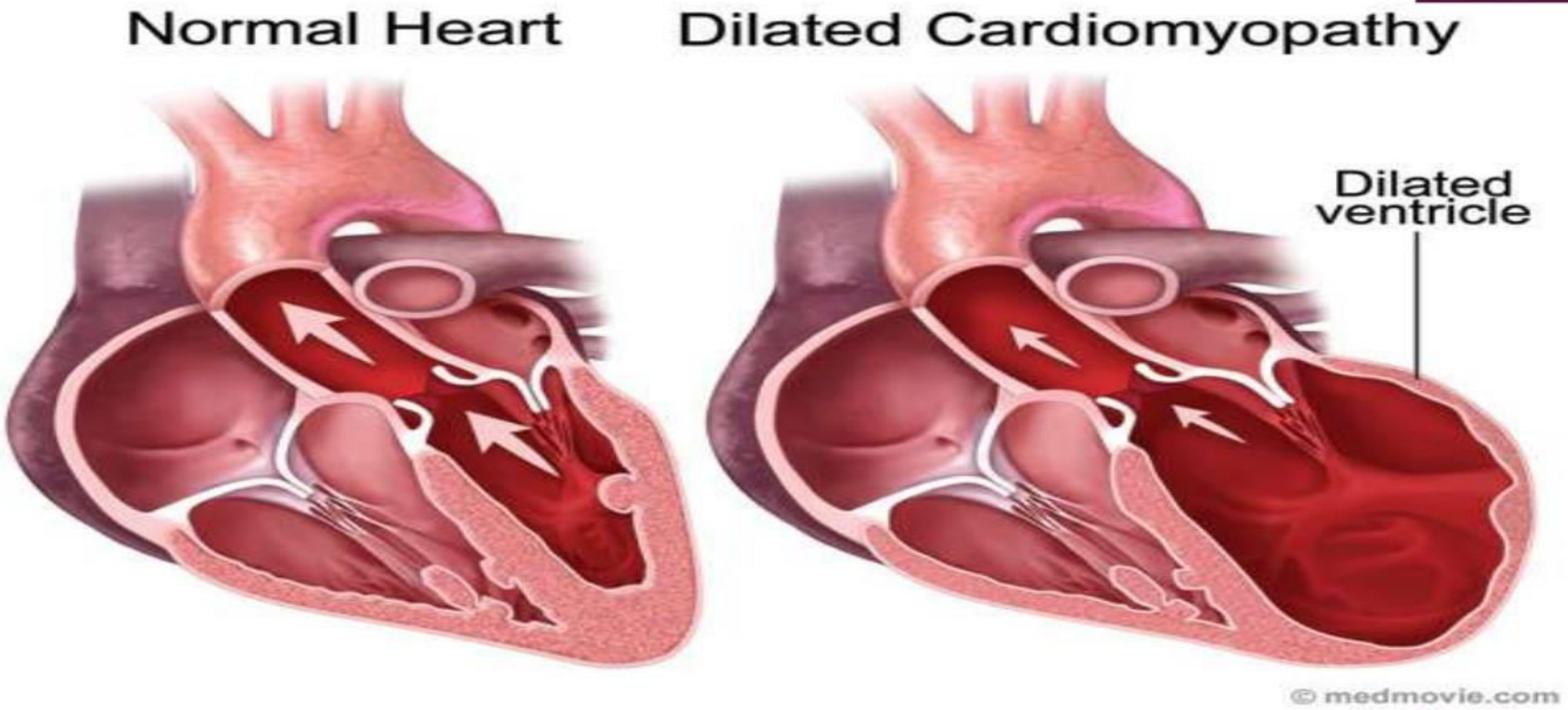
- Certain diseases, such as diabetes, an under- or overactive thyroid gland, or a disorder that causes the body to store excess iron (hemochromatosis)
- Other conditions that affect the heart, such as a disorder that causes the build up of abnormal proteins (amyloidosis).

TYPES OF CARDIOMYOPATHY

- Dilated cardiomyopathy
- Hypertrophic cardiomyopathy
- Restrictive cardiomyopathy

DILATED CARDIOMYOPATHY

- It is a condition in which the hearts ability to pump blood is decreased because the hearts main pumping chamber, the left ventricle, is enlarged or weakened.


Normal Heart
Dilated Cardiomyopathy
Dilated ventricle
© medmovie.com

ETIOLOGY

- Cardiotoxic agents like alcohol or cocaine
- Genetic
- Hypertension
- Ischemia (CAD)
- Muscular dystrophy(weakening and wasting of muscles)
- Myocarditis

Conti….

- Pregnancy
- Valve disease

PATHOPHYSIOLOGY

Characterized by diffuse inflammation and rapid degeneration of myocardial fibers

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Ventricular dilation

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Impairment of systolic function

Conti…

Arterial enlargement and stasis of blood in the left ventricle cardiomegaly

CLINICAL MANIFESTATIONS

- Decreased exercise capacity
- Fatigue
- Dyspnea
- Paroxysmal nocturnal dyspnea
- Orthopnea

Conti…

- **As the disease progresses:**
- Dry cough
- Palpitations
- Abdominal bloating
- Nausea
- Vomiting
- Anorexia

Conti…

- Abnormal S3 and S4 sound
- Tachycardia or bradycardia
- Edema
- Pulmonary crackles
- Weak peripheral pulses
- Hepatomegaly
- Jugular venous distension

DIAGNOSTIC MEASURES

- History
- Echocardiography
- Chest x-ray: shows the signs of cardiomegaly
- ECG: reveals tachycardia, bradycardia and dysarrythmias
- Cardiac catheterization: it is performed to confirm CAD

MEDICAL MANAGEMENT

- Nitrates: eg: isosorbitrate
- Loop diuretics: eg: furosemide
- ACE inhibitors: eg: captopril
- Beta adrenergic blockers: eg: atenolol
- Aldosterone agonists: eg: spironolactone
- Cardiac glycoside: eg: digoxin
- Anticoagulation therapy

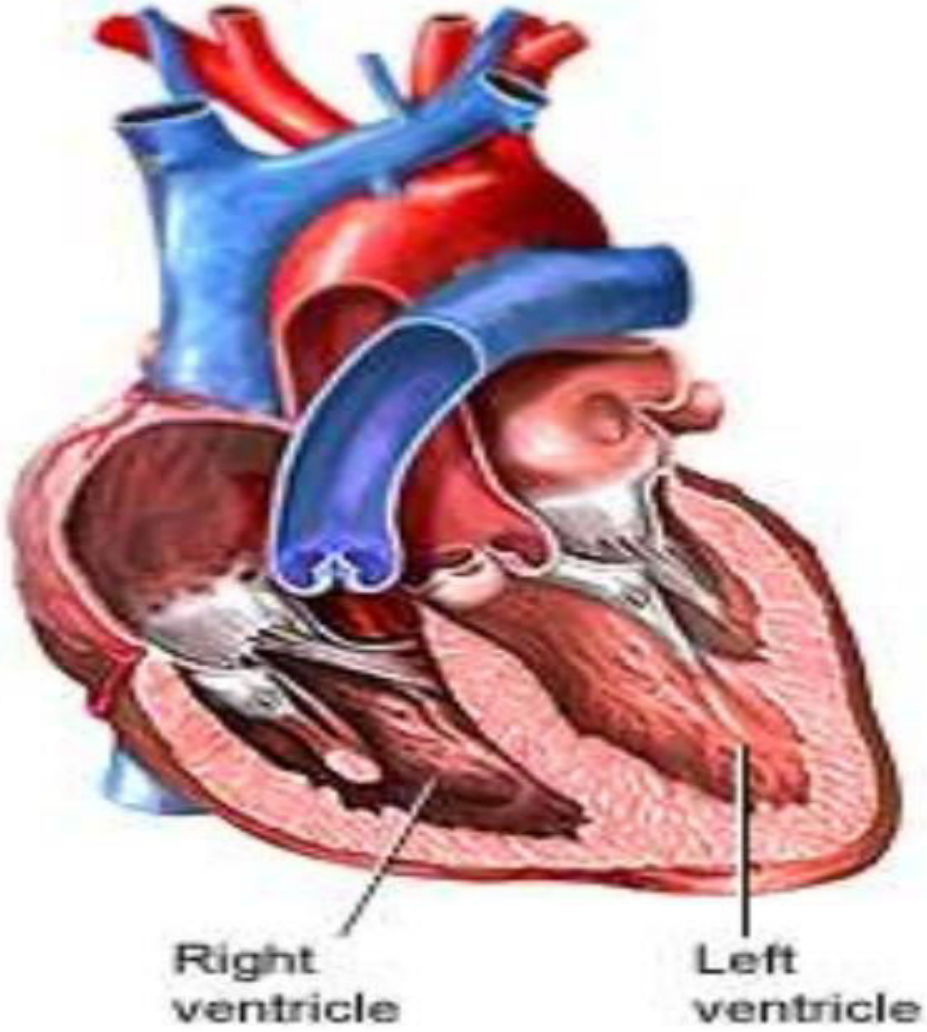
SURGICAL MANAGEMENT

- Cardiac transplantation

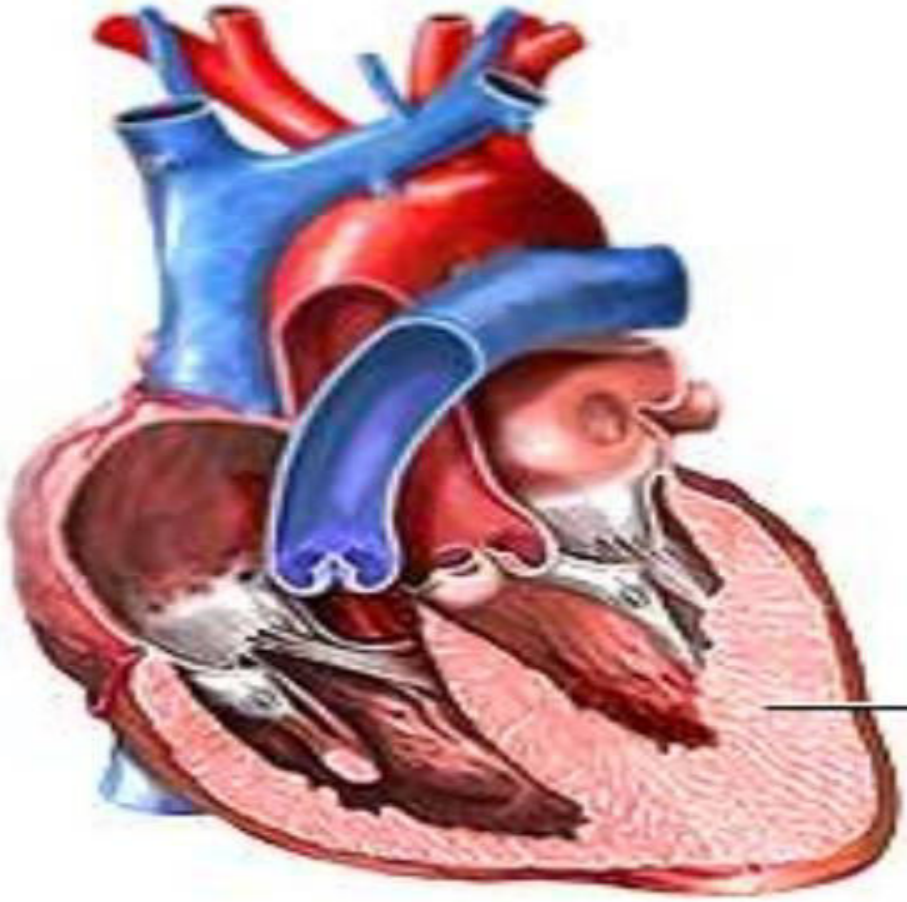
HYPERTROPHIC CARDIOMYOPATHY

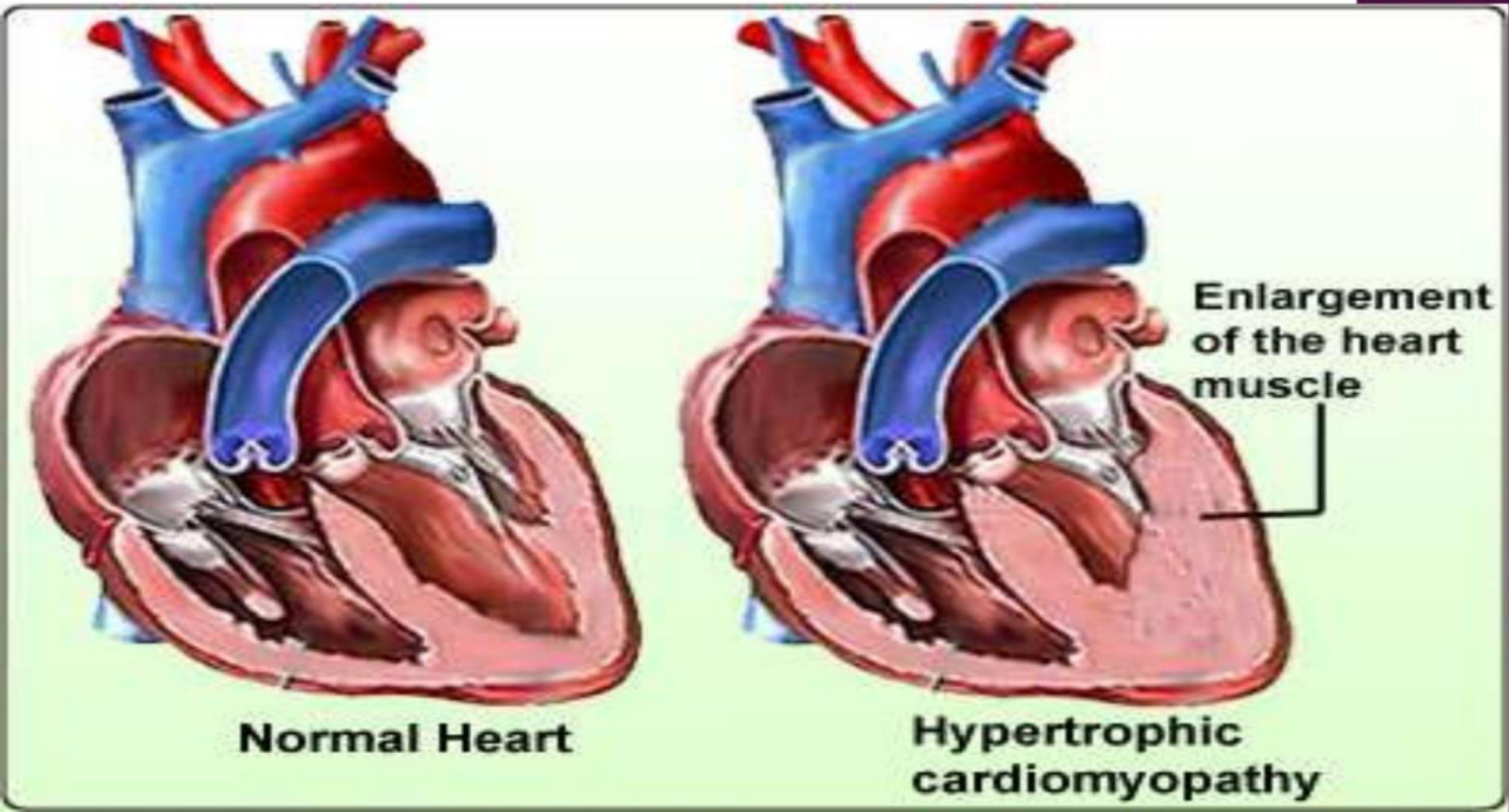
- Assymetric left ventricular hypertrophy without ventricular dilation.
- When the septum between two ventricles become enlarged and obstructs the blood flow from left ventricle, it is known as hypertrophic obstructive cardiomyopathy.

Normal heart



Hypertrophic cardiomyopathy




Enlargement of the heart muscle
Normal Heart
Hypertrophic cardiomyopathy

ETIOLOGY

- Aortic stenosis
- Genetic
- Hypertension
- More common in men between ages 30 to 40

PATHOPHYSIOLOGY

Thickened intra-ventricular septum and ventricular wall

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ventricular hypertrophy

↓

diastolic dysfunction

↓

impaired ventricular filling and obstruction to decreased outflow

↓

decreased cardiac output

CLINICAL MANIFESTATIONS

- Exertional dyspnea (**Shortness of breath** during exercise)
- Decreased cardiac output
- Fatigue
- Angina
- Syncope
- Hypertension

DIAGNOSTIC STUDIES

- History and physical examination

- **Transthoracic echocardiogram.** In this test, a device (transducer) is pressed firmly against your skin. The transducer aims an ultrasound beam through your chest to your heart, producing moving images of the working of the heart.

- **Electrocardiogram (ECG).** Wires (electrodes) attached to adhesive pads on your skin measure electrical impulses from your heart. An ECG can detect enlarged chambers of your heart and abnormal heart rhythms.

- **Cardiac MRI.** A cardiac MRI uses magnetic fields and radio waves to create images of your heart. Cardiac MRI is often used in addition to echocardiography in the evaluation of people with hypertrophic cardiomyopathy.

- **Cardiac catheterization.** In this procedure, a catheter is inserted into a blood vessel, usually in your neck or groin area. The catheter is then carefully threaded to your heart chambers under guidance of an X-ray machine. In addition to measuring pressures in your heart, cardiac catheterization is used to obtain X-ray images (angiograms) of your heart and blood vessels. A dye is injected through the catheter to help visualize your heart and blood vessels. This test is rarely used to diagnose hypertrophic cardiomyopathy.

MANAGEMENT

- Beta adrenergic blockers: eg- atenolol
- Calcium channel blocker: eg- verapamil
- Antidysrhythmic drugs : eg- amiodarone

SURGICAL MANAGEMENT

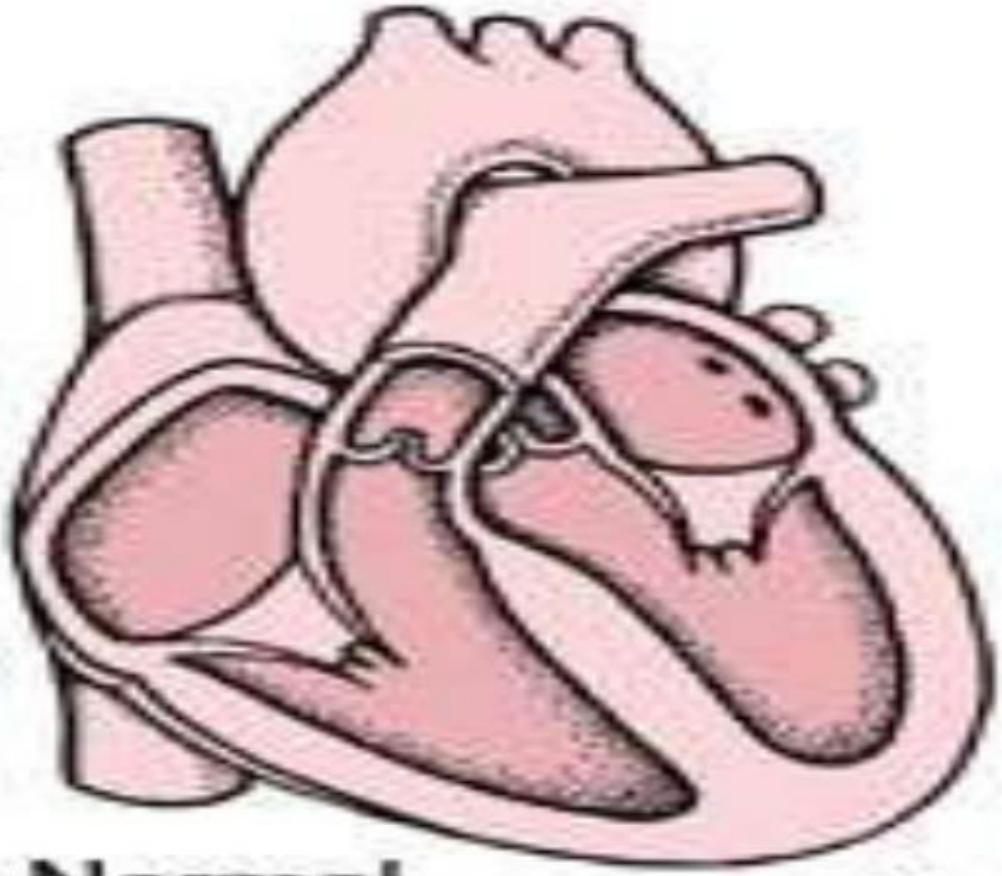
- Septal myectomy:
  - It is an open heart surgical procedure in which the surgeon removes the part of thickened , over grown septum between the ventricles.

- Septal ablation:
  - In this procedure a small portion of the thickened heart muscle is destroyed by injecting alcohol through a long, thin tube into the artery supplying blood to that area.

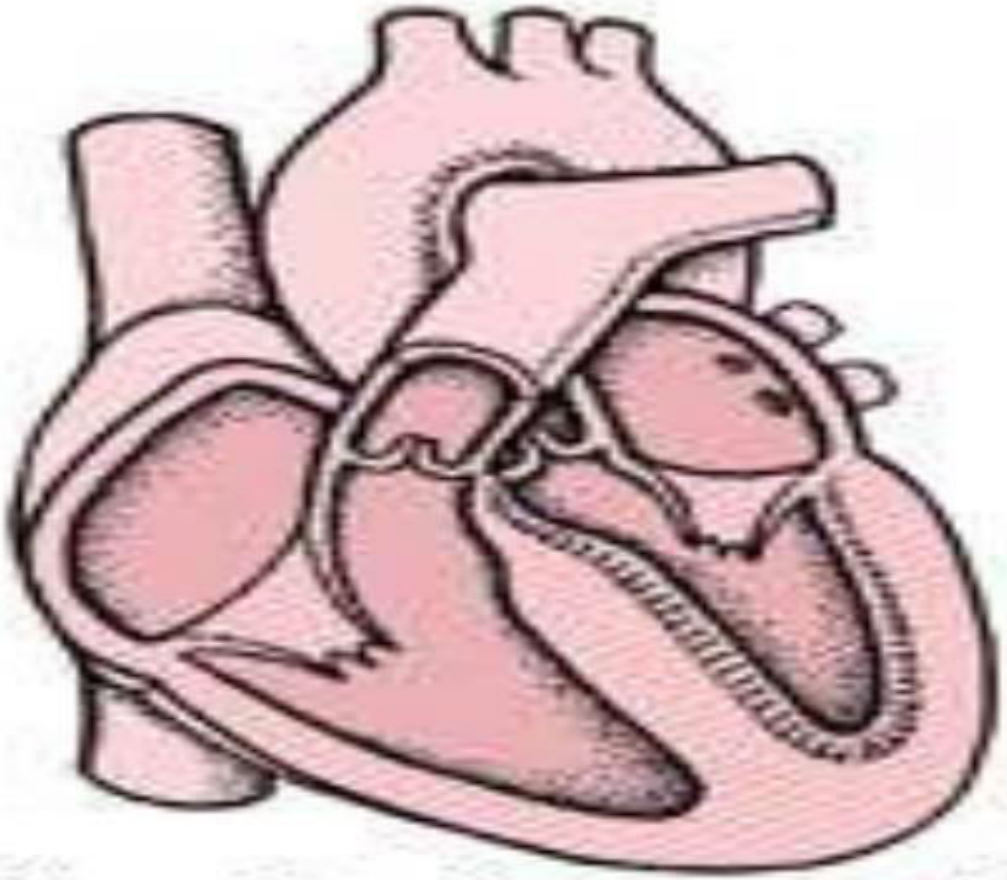
- Implantable cardioverter-defibrillator(ICD):
  - It is recommended when the persons have life threatening heart rhythm disorders. It is a small instrument which can be implanted in the chest as a pacemaker

RESTRICTIVE CARDIOMYOPATHY

- Disease of the heart muscle that impairs diastolic filling and stretch and the systolic function remains unaffected.



Normal



Restrictive Cardiomyopathy

In restrictive cardiomyopathy, the walls of the ventricles become stiff, but not necessarily thickened.

ETIOLOGY

- Unknown etiology

- Myocardial fibrosis,endocardial fibrosis, sarcoidosis and radiation to the thorax

PATHOPHYSIOLOGY

etiologic factors

↓

Stiffness of the ventricular wall with loss of ventricular compliance

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Ventricles become resistant to filling

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decrease cardiac output

CLINICAL MANIFESTATIONS

- Fatigue
- Exercise intolerance
- Dyspnea
- Orthopnea(shortness of breath (dyspnea) which occurs when lying flat)
- Syncope
- Palpitations
- Peripheral edema
- Jugular venous distention

DIAGNOSTIC STUDIES

- Chest x-ray: shows cardiomegaly
- ECG: shows tachycardia
- Echocardiography : for the visualization of left ventricle
- CT-Scan and MRI Scan

MANAGEMENT

- Beta adrenergic blockers: eg- atenolol
- Calcium channel blocker: eg- verapamil
- Steriods: hydrocortisone
- Antidysrhythmic drugs : eg- amiodarone

- A heart transplantation may be considered if the heart function is very poor and the symptoms are severe.

NURSING MANAGEMENT

- Instruct the patient to take all medicines on prescribed time.
- Encourage to use low sodium diet
- Instruct to drink more water
- Instruct the patient to maintain proper body weight
- Teach the patient to balance activity and rest
- Instruct the patient to avoid vigorous activities and exercises

- Encourage to perform stress reduction activities.
- Teach about breathing and coughing exercise
- Suggest the family members to learn about CPR.

- Decreased cardiac out put
- Impaired tissue perfusion
- Impaired breathing pattern
- Imbalanced nutrition
- Impaired physical mobility
- fatigue

PROGNOSIS

- This has a poor prognosis fifty percent of patients die within 2 years; 25% of patients survive longer than 5 years. The two most common causes of death are progressive cardiac failure and arrythmia.

COMPLICATIONS

- **Heart failure.** Your heart can't pump enough blood to meet your body's needs. Untreated, heart failure can be life-threatening.
- **Blood clots.** Because your heart can't pump effectively, blood clots might form in your heart. If clots enter your bloodstream, they can block the blood flow to other organs, including your heart and brain.

Conti….

- **Valve problems.** Because cardiomyopathy causes the heart to enlarge, the heart valves might not close properly. This can lead to a backward flow of blood.
- **Cardiac arrest and sudden death.** Cardiomyopathy can lead to abnormal heart rhythms. These abnormal heart rhythms can result in fainting or, in some cases, sudden death if your heart stops beating effectively.

PREVENTION

- Avoiding the use of alcohol or cocaine
- Controlling high blood pressure, high cholesterol and diabetes
- Eating a healthy diet
- Getting regular exercise
- Getting enough sleep
- Reducing your stress

Conti….

- maintaining a healthy weight
- eating a modified diet
- limiting caffeine intake
- getting enough sleep
- managing stress
- quitting smoking
- limiting alcohol intake
- getting support from their family, friends, and doctor

THANK YOU