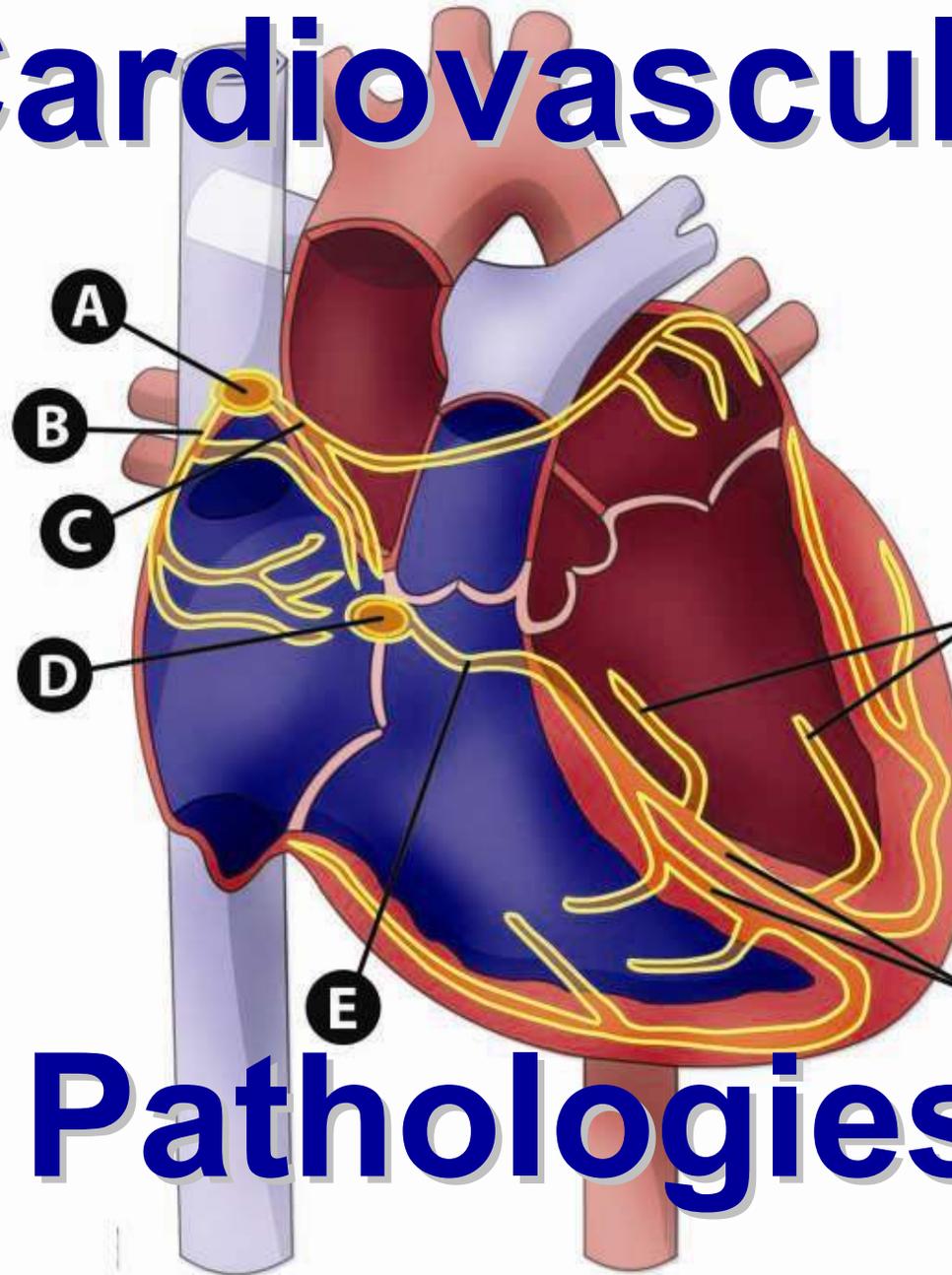
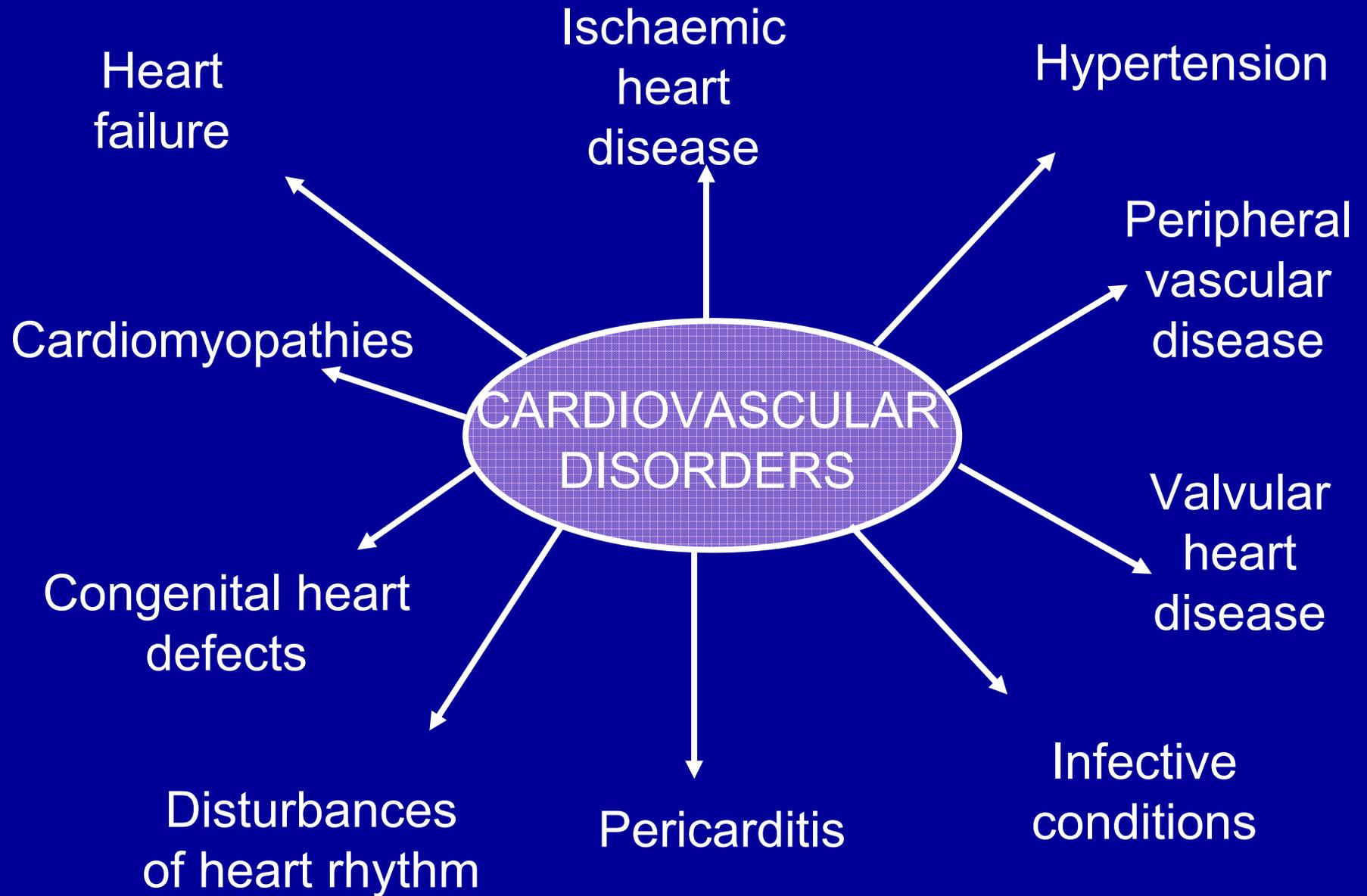


# Cardiovascular



# Pathologies



**Thrombosis**

**Atheroma**

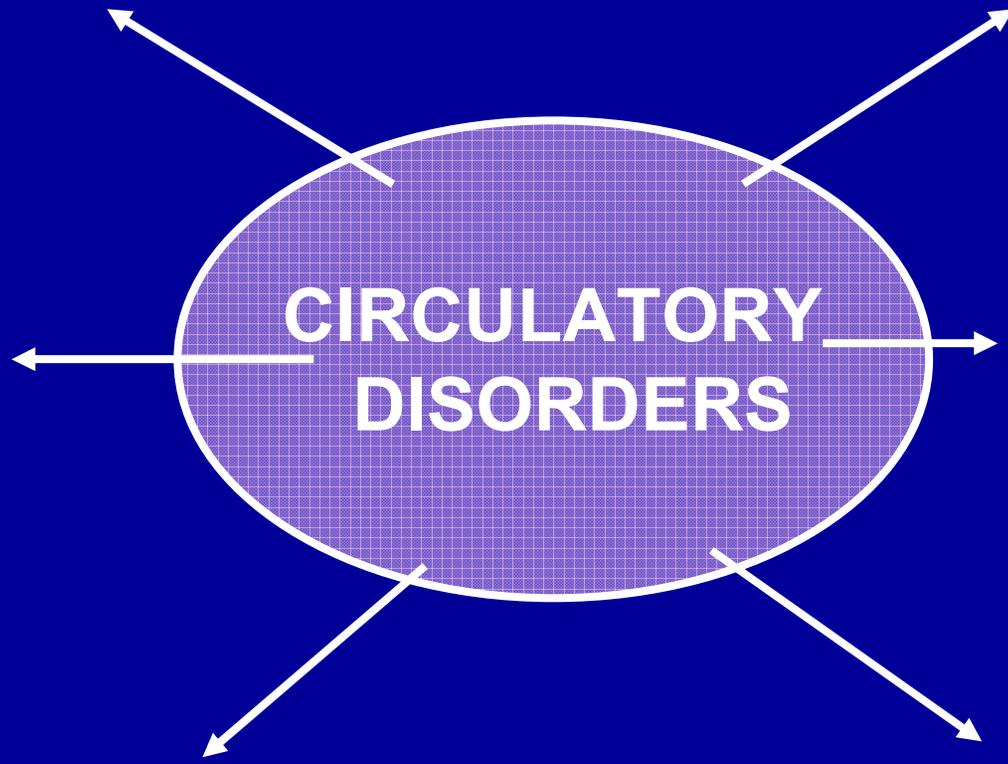
**Shock**

**CIRCULATORY  
DISORDERS**

**Athero-  
sclerosis**

**Oedema**

**Clotting  
disorders**



# CLOTTING DISORDERS

## Factors

### Blood vessel abnormalities:

- Congenital
- Acquired

### Platelet disorders

- Increase destruction
- Decreased production

### Defects in clotting system

- Congenital
- Acquired

**Bleeding due to overactivity of fibrinolytic system**

# OEDEMA

## **Local:**

- **Inflammation**
- **Venous obstruction**
- **Ascites**
- **Lymphatic obstruction**
- **Pulmonary**

## **Generalised:**

- **Cardiac**
- **Renal**
- **Famine**

## RISK FACTORS FOR ISCHAEMIC HEART DISEASE

- **Smoking**
- **Hypertension**
- **Hyperlipproteinaemia**
- **Being male**
- **Getting older**
- **Family history**
- **Diabetes**
- **Gout**
- **Too much salt**
- **High consumption of fats**
- **Too little fibre**
- **Obesity**
- **Emotional stress**
- **Contraceptive pill**

**HEART  
FAILURE**

```
graph TD; HF(HEART FAILURE) --> RHF(Right heart failure); HF --> LHF(Left heart failure); RHF --> THF[Total heart failure]; LHF --> THF;
```

**Right heart failure**

**Left heart failure**

**Total heart failure**

# Cor pulmonale

**Cor pulmonale is lung disease complicated by the following:**

- Right ventricular failure
- Fluid retention
- Chronic hypoxia
- Excluded is right ventricular enlargement secondary to:
  - Diseases of the left side of the heart
  - Congenital heart disease

# Cor pulmonale

- Chronically low blood levels of oxygen may lead to pulmonary hypertension (high blood pressure in the lungs), and possibly to cor pulmonale.
- Cor pulmonale is also called right-sided heart failure, and is characterized by enlargement of the right ventricle.
- Treatment targets the underlying illness and may include supplemental oxygen, a low-salt diet or calcium channel blockers

# Heart failure

“Heart Failure is a chronic condition in which a diseased heart decreases a person's ability to be as physically active as they should be.”

Heart failure may be acute or chronic:

- Acute heart failure has a dramatic presentation:
  - Dyspnoea
  - Orthopnoea
  - Oedema, either pulmonary or peripheral
  - Organ underperfusion
  - Tachycardia
- Chronic heart failure may be more insidious:
  - Chronic exercise limitation

# Heart failure

- **Structural changes**
  - **Compromised ventricular walls**
- **Functional changes**
  - **Systolic & diastolic dysfunction**

## Ischaemic heart disease (and myocardial infarction)

- Myocardial infarction is the main cause of death in Western societies.
- In the UK the incidence is 500/100000 of the population per year.
- The mortality from myocardial infarction is 25% - half of those who die never reach hospital.
- Myocardial infarction accounts for one third of the mortality which can be attributed to coronary artery disease.
- Atheromatous coronary artery disease is almost always the cause of myocardial infarction.

## **Factors most strongly implicated in atherosclerosis are:**

- **Male sex**
- **Age**
- **Smoking - two to three fold increase in risk**
- **Hypertension - two to three fold increase in risk**
- **Diabetes - two to three fold increase in risk**
- **Syndrome X**

**SYNDROME X:** The National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III guidelines have suggested that a diagnosis of metabolic syndrome (previously known as syndrome X) where three or more of the following risk factors are present: central obesity, elevated triglyceride, low HDL, raised blood pressure and raised fasting plasma glucose.

### **Risk Factor Defining Level**

**Central (abdominal) obesity (\*waist circumference)**

**men** > 102 cm (>40 in)

**women** > 88 cm (>35 in)

### **high-density lipoprotein cholesterol**

**men** <1.0 mmol/L (<40mg/dL)

**women** <1.3 mmol/L (<50mg/dL)

**triglycerides**  $\geq$  1.7 mmol/L ( $\geq$  150mg/dL)

**blood pressure**  $\geq$  130/85 mmHg **fasting plasma glucose**  $\geq$

6.6 mmol/L ( $\geq$ 110mg/dL)

# Clinical features of MI

- Chest pain:
  - Central, crushing pain
  - May radiate to the jaw, neck, and one or both arms
  - Is a similar pain to that found in angina pectoris but patients with previous angina will often complain that the pain is more severe and lasts longer than angina
- Nausea, vomiting, sweating
- The patient is often distressed and may be tachycardic, cold and clammy.
- Plus others...

# Myocardial infarction

- A heart attack (also known as a myocardial infarction) is the death of heart muscle from the sudden blockage of a coronary artery by a blood clot. Coronary arteries are blood vessels that supply the heart muscle with blood and oxygen.
- Blockage of a coronary artery deprives the heart muscle of blood and oxygen, causing injury to the heart muscle. Injury to the heart muscle causes chest pain and pressure. If blood flow is not restored within 20 to 40 minutes, irreversible death of the heart muscle will begin to occur.
- Muscle continues to die for six to eight hours at which time the heart attack usually is "complete." The dead heart muscle is replaced by scar tissue.

# Hypertension

## (A) Systemic

- **Essential hypertension**
  - secondary hypertension
  - paroxysmal hypertension
  - malignant hypertension
  - hypertension in pregnancy
    - Systolic >140, Diastolic >90
    - Sustained
    - Essential

**Secondary**

## (B) Pulmonary

## (C) Portal

# Portal Hypertension

- The normal pressure in the venous portal system is 7-14 mm Hg. In portal hypertension, levels may rise to 20-50 mm Hg.
- Raised pressure stimulates expansion of collaterals between the portal and the systemic venous systems.

## Presenting features of Portal hypertension:

- Haematemesis or melaena - due to rupture of gastro - oesophageal varices
- Ascites - with low plasma albumin
- Hepatic encephalopathy
- Porto-systemic shunts - e.g. Caput medusae
- Venous hum
- Haemorrhoids
- Peripheral oedema

# Arteriosclerosis / Atherosclerosis

- **Arteriosclerosis**: This is a term that is used to describe the age-related, generalised, arterial changes which include muscular hypertrophy of the media, fibrosis and luminal changes
- **Atherosclerosis** is a patchy, focal disease of the intima and inner media of large and medium sized musculo-elastic arteries including the aorta.

# Peripheral Arterial Disease (PAD)

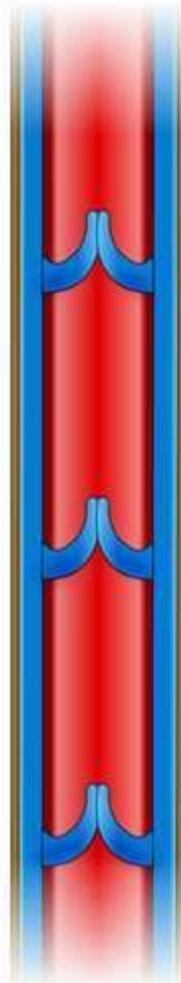
- There are several stages in the severity of PAD in the lower limb:
- Intermittent claudication:
  - Pain, usually in the calf, that is precipitated by walking
- Rest pain:
  - Pain, usually in the foot, that is worse elevated in bed at night and is relieved by lowering the leg
- Arterial ulceration of the leg and foot
- Gangrene of the leg and foot

# Valve disease

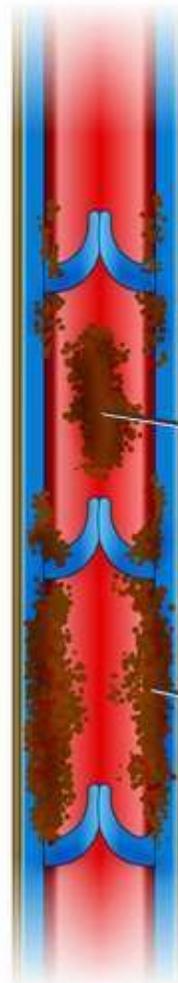
- Atrio-ventricular valves
  - Tricuspid
  - Mitral
- Semilunar valves
  - Pulmonic
  - Aortic

## Deep vein thrombosis (DVT)

Normal



DVT



Embolus

Thrombus formation

# Infections and myocarditis

- Viruses
- Bacteria
- Protozoa
- Metabolic disturbances
- Connective tissue disease
- Drugs

# ENDOCARDITIS

- Acute
- Subacute
- Infective endocarditis
- Endocarditis associated with rheumatic fever
- Nonbacterial thrombotic endocarditis

# Pericarditis

- Viral
- Bacterial
- Tuberculous
- Uraemic
- The pericarditis of myocardial infarction
- Dressler's pericarditis (2-10/52 after MI or surgery)
- Malignant

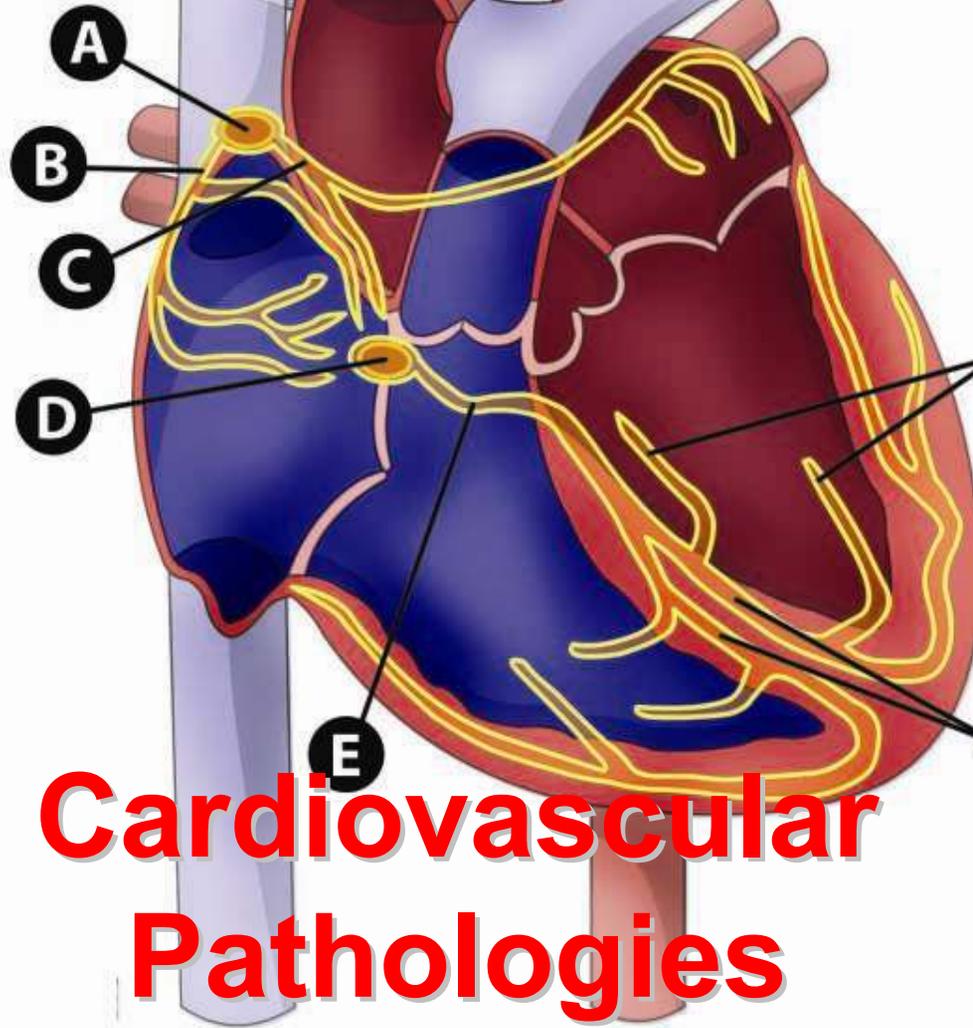
# Arrhythmias

- The rate of the rhythm:
  - Tachyarrhythmias
  - Bradyarrhythmias
- The site of generation of the arrhythmia:
  - Supraventricular
  - Ventricular
- Extra systoles
  - Atrial
  - Ventricular

# SHOCK

Shock is a profound haemodynamic and metabolic disturbance characterised by failure of the circulatory system to maintain adequate perfusion to vital organs.

**End**



**Cardiovascular  
Pathologies**