Screening Method of Anti-angina

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- Cause of angina
- Symptoms of angina
- Type of angina
- Classification of anti-anginal drug
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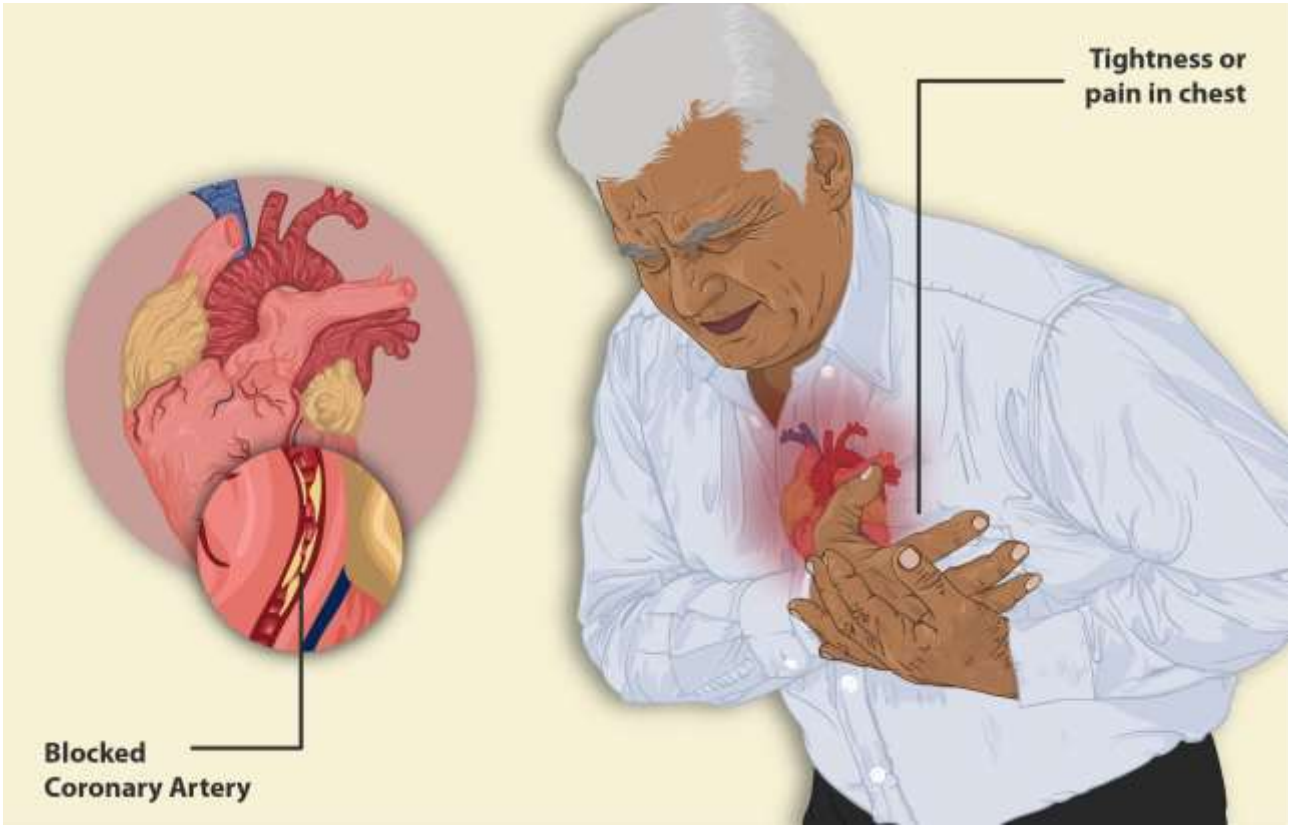
Introduction

- Angina pectoris is a symptoms of ischamic(less blood supply) heart disease.
- It is due to an imbalance between oxygen supply and oxygen demand of the mycocardium.



Cause of Angina

- Coronary Artery Disease
- Atherosclerosis
- Smoking
- High Blood Pressure
- High Cholesterol
- Diabetes
- Family History
- Obesity
- Lack of physical activity
- Stress

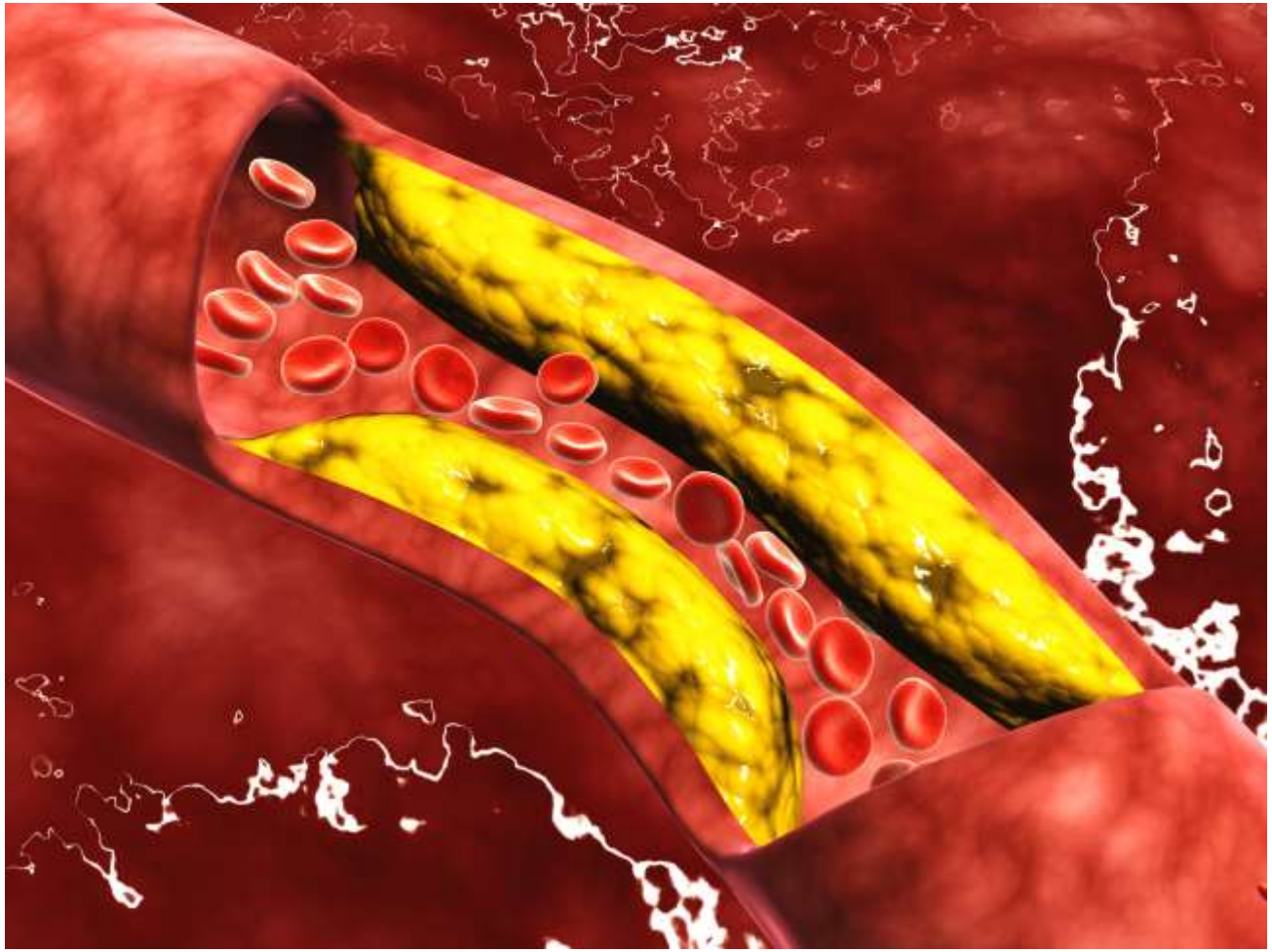
Symptoms of Angina

- Weakness
- Heartburn
- Sweating
- Shortness of breath
- Anxiety
- Chest pain
- Indigestion

Types of Angina

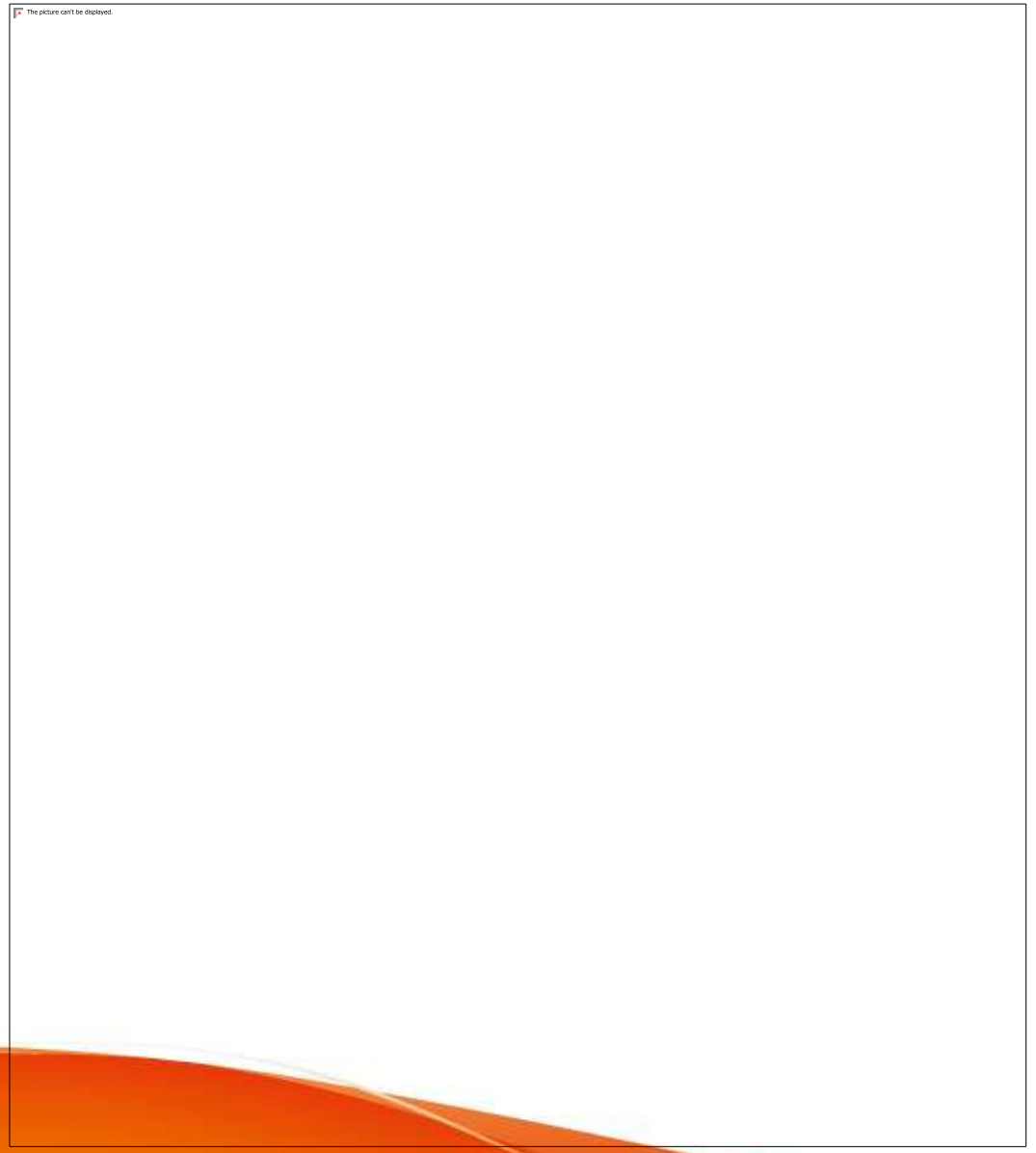
Classic Angina(Angina of Exercise)-

- This angina pain occurs when the demand of oxygen exceeds the supply of oxygen most commonly due to diminished coronary flow.



Vasospastic(Prinzmetal's or Variant) Angina

- This angina pain occurs at rest and is characterised by reversible coronary vasospasm, which in turn reduces the supply of oxygen.



Clssification of Anti-angina Drug

Nitrates-

- **Long acting-** Isosorbide dinitrate(oral) Isosorbide mononitrate.
- **Short acting-** Glyceryl trinitrate,Isosorbide dinitrate(sublingual)

B-blocker- Propranolol,Metaprolol,Atenolol.

Calcium channel blocker- Verapamil,Amlodipine,Diltiazem.

Pot.channel opener- Nicorandil.

Other anti-anginal- Trimetazidine,Ranolazine,Aspirin.

PRECLINICAL EVALUATION

IN VITRO

- Isolated heart (Langendorff) technique
- Isolated heart-lung preparation
- Relaxation of bovine coronary artery
- Coronary artery ligation in isolated rat heart
- Isolated rabbit aorta preparation
- Plastic costs technique in dogs

IN VIVO

- Coronary artery occlusion
- Isoproterenol-induce myocardial necrosis
- Stenosis-induce coronary thrombosis model
- Electrical stimulation-induced coronary thrombosis
- Myocardial ischemic preconditioning model
- Electromagnetic flow meter
- Occlusion of coronary artery

IN VITRO

Isolated heart(Langedorff) technique-

Principal- is to maintain the heart perfused at constant temperature.

- Estabished in 1897 by Oscar Langendorff

Requirments- Guinea pigs (300-500gm)

Cold perfusion solution(4c)

Oxygentaed ringer solution

Equipments- Thoracic cage

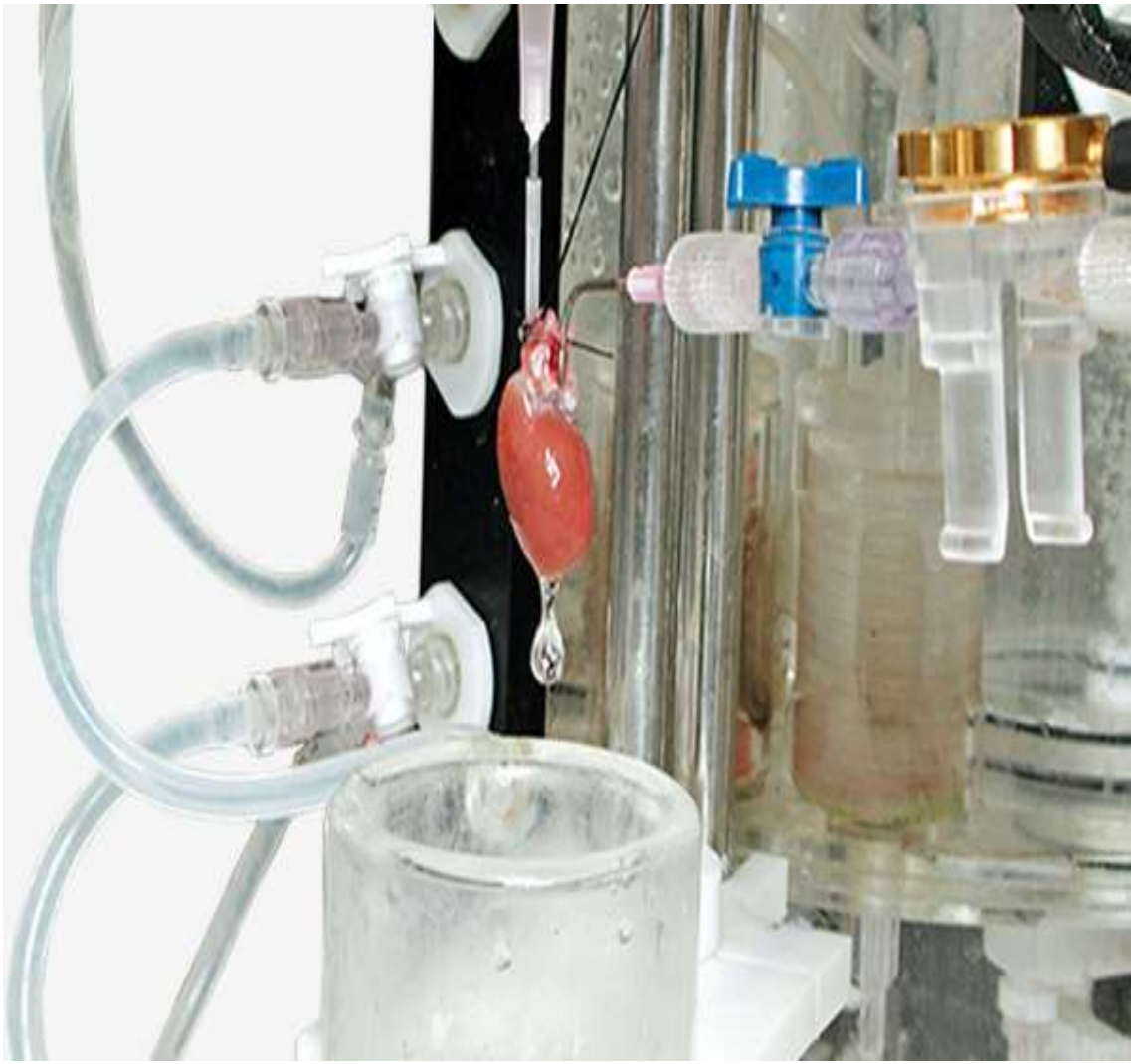
Chronometer

Cannula,Double wall plexiglass perfusion apparatus,Small steel hook,Force transducer, polygraph.

Procedure

- Guinea pigs of either sex weighing 300 to 500gm used for study and they are sacrificed by stunning.
- Diaphragm is assessed by transabdominal incison and cut carefully to expose,the thoracic cavity.
- Thoracic is opend by bilateral incision along the lower margins of last to first ribs.
- The heart is cradled between finger and lifted before incising the arota, enclave pulmonary veins.


LabChart
LabChart



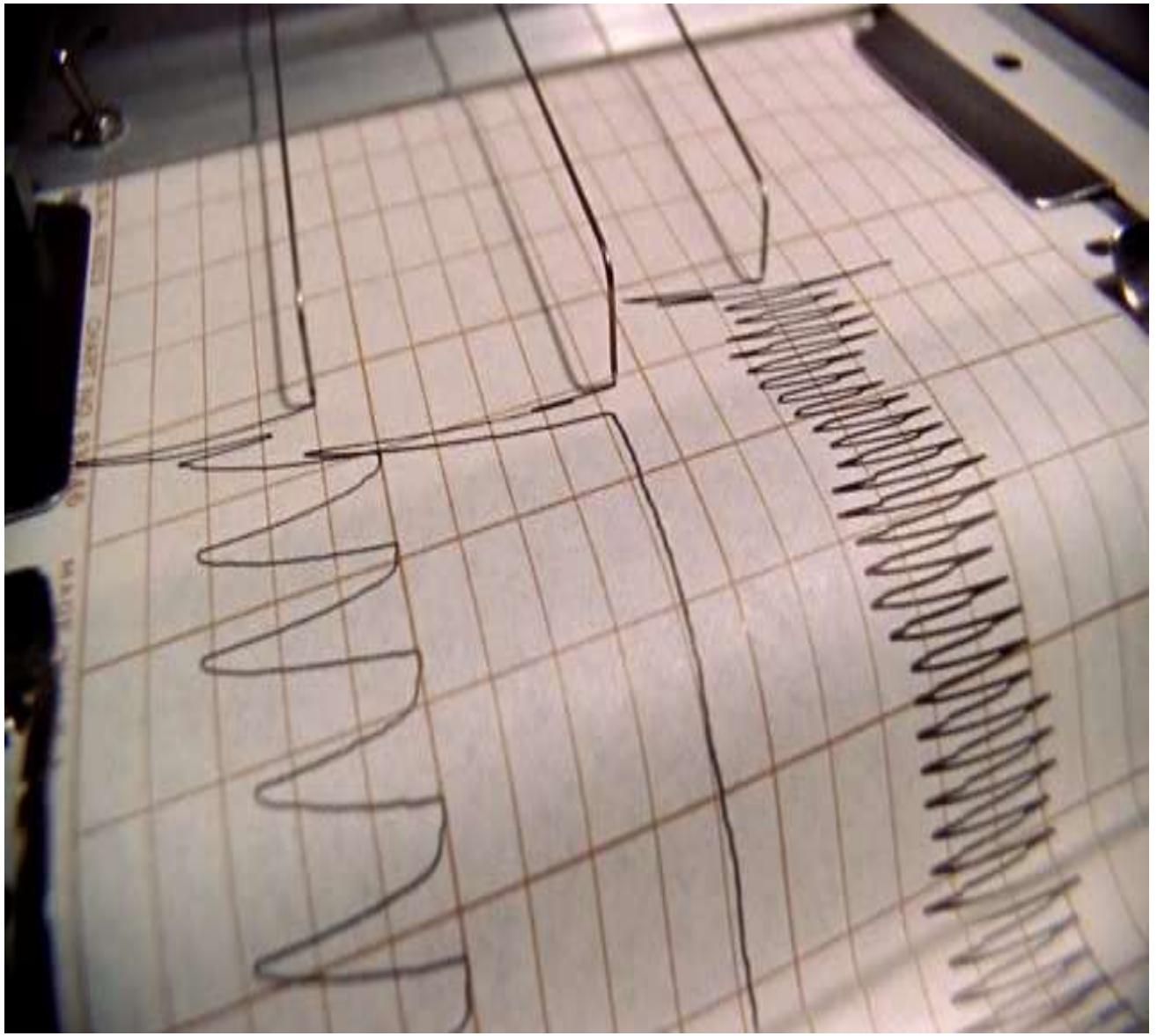
- Immediately after excision, heart is dipped in cold perfusion solution .The arota is located and cut below the point of division.
- Cannula is inserted into the arota and tied the heart per fused with oxygenated ringer’s solution.
- The heart is transferred to a double wall plexiglass perfusion apparatus maintained at 37c,40mm Hg pressure.
- Small steel hook with a string is attached to apex of the heart.
- Contractile force is measured isometrically by a force transducer and recorded on a polygraph.

- Heart rate is measured through a chronometer coupled to the polygraph.
- Then drugs(standard,test) are injected into the perfusion medium.
- The atherosclerosis effect of test drug is indicated by an increase in coronary blood flow.

Conculsion- The incidence and duration of ventricular fibrillation coronary flow in atrophic state and K+ levels after treatment with drug are compared with control.

- Heart rate by chronometer-attached to polygraph.

- Contractile force is measured isometrically by a force transducer.
- Cardiac output determined by electromagnetic flow probes in the outflow system.



Isolated heart-lung preparation

Aim- The isolated heart lung preparation is used to study various physiological and pharmacological processes.

Animal required- wistar rat (300-500gm)

Chemical required- Pentobarbitone sodium

Ice-cold saline

Krebs ringer,bicarbonate buffer

Equipments required- Cannula, Artificial respiration, Electrical amplifer.

Procedure

- Wistar rat is anaesthized with pentobarbitone sodium(50mg/kg).
- The Trachea is cannulated animals is maintained on artificial respiration.
- The chest cavity is opened and ice - cold saline is injected to arrest the heart.
- The aorta, superior and inferior vene cave are calculated.
- The heart lung preparation is per fused with Krebs-Ringer bicarbonate buffer (pH-7.4) containing rat RBC (hematocrit 25%).

- The perforate is pumped from the arota and is passed through the pneumatic resistance and collected in a reservoir maintained at 37c.
- It is then returned to inferior vena cave thus perfusing only the heart and the lung.
- Test drug is administered into the perforate 5min after start of experiment.

- Cardiac output is recorded with an electronmagnetic blood flow meter and mean arterial pressure from the pneumatic resistance.
- with the help of a bio electrical heart rate is recorded.

Conclusion- Hemodynamic data and recovery time of the test drug group and control group(without any treatment) is compared using ANOVA and Kruskal-Wallis test respectively.