

Angina Pectoris

Define : Transient reversible cardiac ischemia characterized by central chest pain / discomfort may be radiating to, one or both arms; neck; jaw; epigastrium.

↳ It is medical term for chest pain or discomfort due to coronary heart disease.

Occurs when heart muscle doesn't get as much blood as it needs

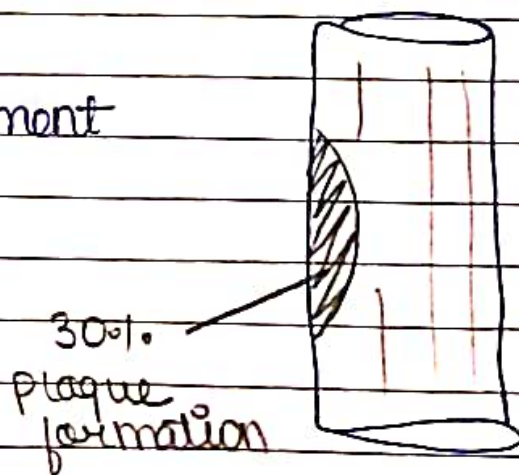
Usually happens bcz one or more of the heart's arteries is blocked or narrowed also called ischemia.

Types of angina

(A) Stable angina:

It is the most common form of angina. they are characterized by attacks of pain due to physical exercise and gets relieved (relaxed) by rest.

ECG : depression of ST segment



(B.) Unstable angina :

- Called as 'pre-infarction angina'
- Most serious pattern of angina
- characterized by more frequent onset of pain of prolonged duration, occur also at rest.

ECG : No ST segment elevation

70%
 plaque formation



(C.) Variant angina :

- called 'prinzmetal angina'
- characterized by pain at rest and has no relationship with physical activity.
- may occur due to sudden vasospasm of coronary trunk induced by atherosclerosis.

ECG : ST segment elevation



coronary
 spasm

Symptoms

Angina symptoms include chest pain and discomfort.

The chest pain / discomfort may feel like:

You may also have pain in your arms, neck, jaw, shoulder or back.

Can also have:

Nausea

Shortness of breath

Abdominal pain

Discomfort in neck, jaw or back

Stabbing pain instead of chest pressure

Burning

Dizziness

Fatigue

Sweating

Any new or worsening angina can vary.

Diagnosis

To diagnose angina, health care providers will have to do a physical examination (ask about symptoms).

↳ Ask patient about any family history of heart disease.

(a) Electrocardiogram (ECG):

- Measurement of electrical activity of heart.
- placed on chest; sometimes arms & legs.
- ECG shows if heart is beating too fast, too slow, or not at all.
- Look for patterns in heart rhythm.

(b) Chest X-ray:

- Shows condition of heart and lungs.
- performed to determine if the heart is enlarged.

(c) Blood tests:

Certain heart enzyme enter the blood stream, if any heart muscle is damaged, such as from heart attack.

(d) Echo cardiogram:

- It uses sound waves to create images of heart in motion.
- This image can show how blood flows through heart.

(e) Cardiac - computerized tomography: (CT)

- X-ray tube (inside the machine) rotates around body & collects images of heart & chest.
- Shows if heart is enlarged or if any heart arteries is narrowed.

(f) Coronary angiography:

Examined inside of heart's blood vessels

Pathophysiology

STABLE

Atherosclerotic plaque formation in coronary artery

Ca plaque covers approx. $\geq 70\%$ diameter of the vessel (lumen)



Obstruct blood supply in coronary artery



This less blood supply is enough for resting condition



But when there is exertion / emotional stress there will be more work load of heart



This increased workload can't be full fulfilled as there would be no dilation of sclerotic point



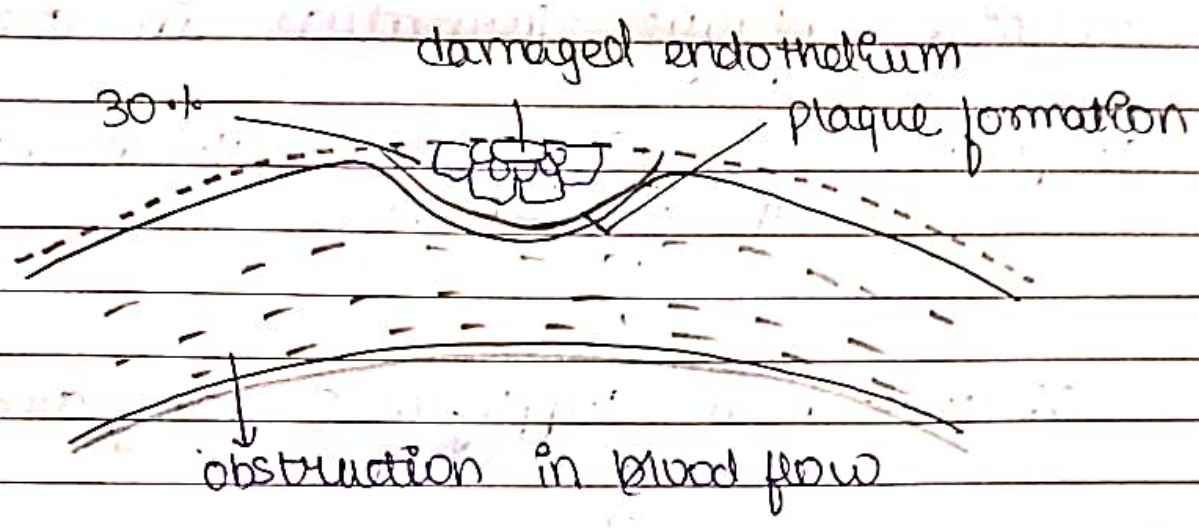
Decreased blood supply to myocardium
— ISCHEMIA



less oxygen supply ;
More oxygen demand at time of exertion
can't be fulfilled.

↓

Resulting into chest pain at time of exertion.



UNSTABLE

Atherosclerotic plaque formation

↓

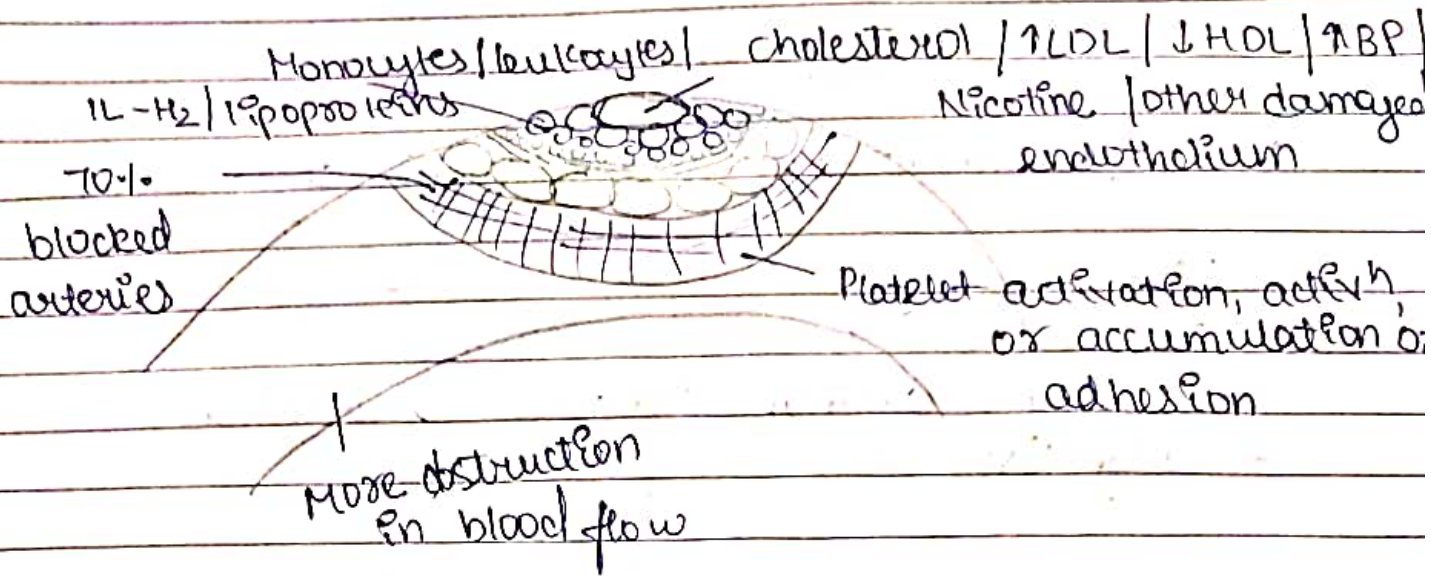
Fibrous tissue binding

↓

Platelet adhesion, activation and aggregation

↓

then (diagram).



VARIANT (prinzmetal)

vasospasm in coronary artery



Decreased blood supply to myocardium - Ischemia



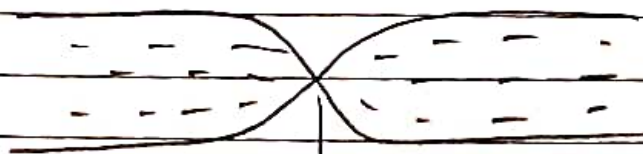
Less O₂ supply



Myocardial demand won't be fulfilled



Resulting into chest pain



Coronary artery spasm

Treatment

(A) Non-pharmacology treatment of Angina.

- Diet
- Exercise
- Smoking, alcohol, tobacco restriction
- Weight loss.

(B) Pharmacological treatment :

1. Nitrates :

relax & widen blood vessels.

* Short acting

Glycerol trinitrate 2.5mg

Isosorbide dinitrate (sublingual) 5mg

* Long acting

Iso din (oral) 10-20 mg

Iso mono (oral) 10-40 mg

2. β -blockers :

cause heart to beat slowly with less force, which decreases BP.

Metoprolol	50mg	1-0-1
Atenolol	50mg	1-0-1
Bisoprolol	10 400 mg	

3. CCB

relax, widen vessels to improve flow.

Verapamil	120 ¹²⁰ mg	0-1-0
Diltiazem	180 mg	0-1-0

4. K channel opener

Nicorandil	10mg	1-0-1
Cef feel headache		

5. Other anginal drugs

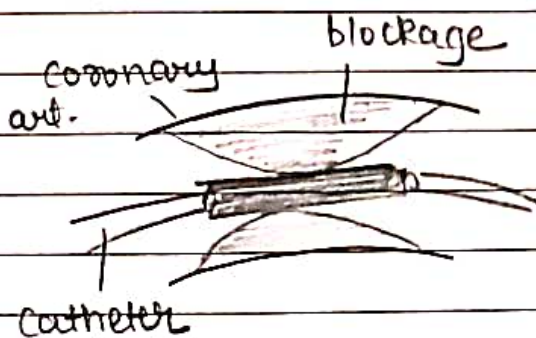
Ranolazine	5mg	PO 1-0-1 with meal
OR		
Ivabradine		

→ Surgery

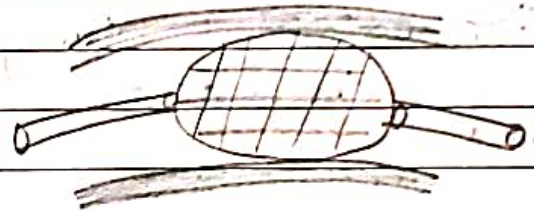
If lifestyle changes, medication or other therapies don't reduce pain, a catheter procedure or open heart surgery is needed.

1. Angioplasty with stenting:

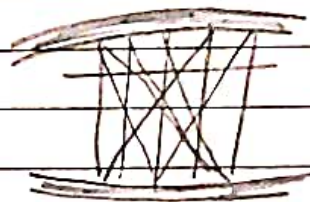
tiny balloon is inserted into the artery, balloon is widened into the artery and then a small wire mesh coil (Stent) is inserted, to keep it open.



* Stent with balloon



* Balloon inflated



* Balloon removed from stent

2. Open heart surgery (coronary artery bypass surgery)

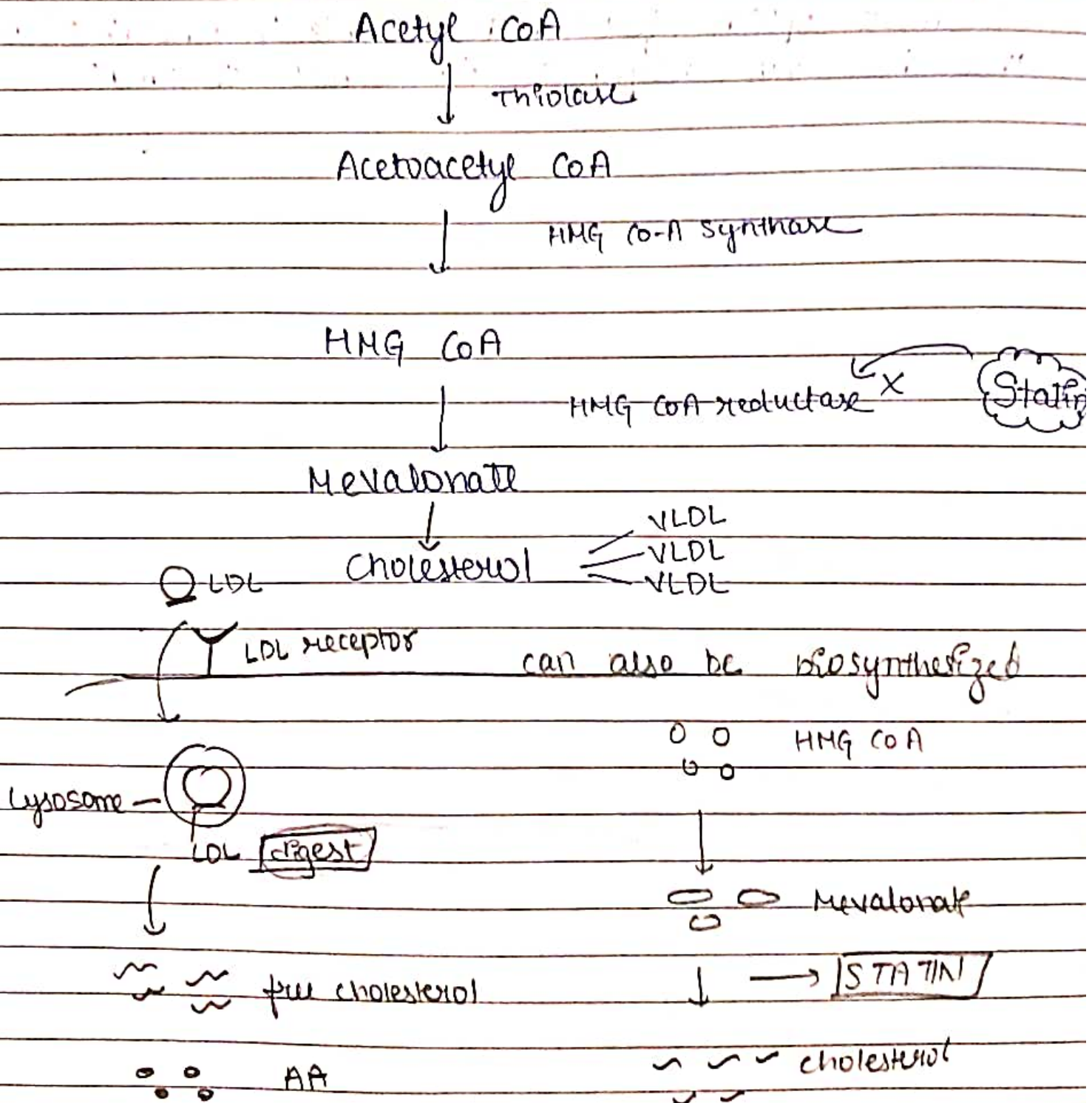
During this surgery, a vein / artery / vessel from anywhere else in body is used to bypass a blocked or narrowed heart artery.

Treatment option for both stable & unstable ang that has not responded to other treatments.

Mechanism of Action

(a) Atorvastatin :

(HMG - Co enzyme reductase inhibitor)
and hypolipidemic



if there is no cholesterol biosynthesized, there will be more LDL receptor waving therefore produce more free cholesterol.

Dose — Moderate
10-20 mg OD

High
40-80 mg OD

Therapeutic uses :

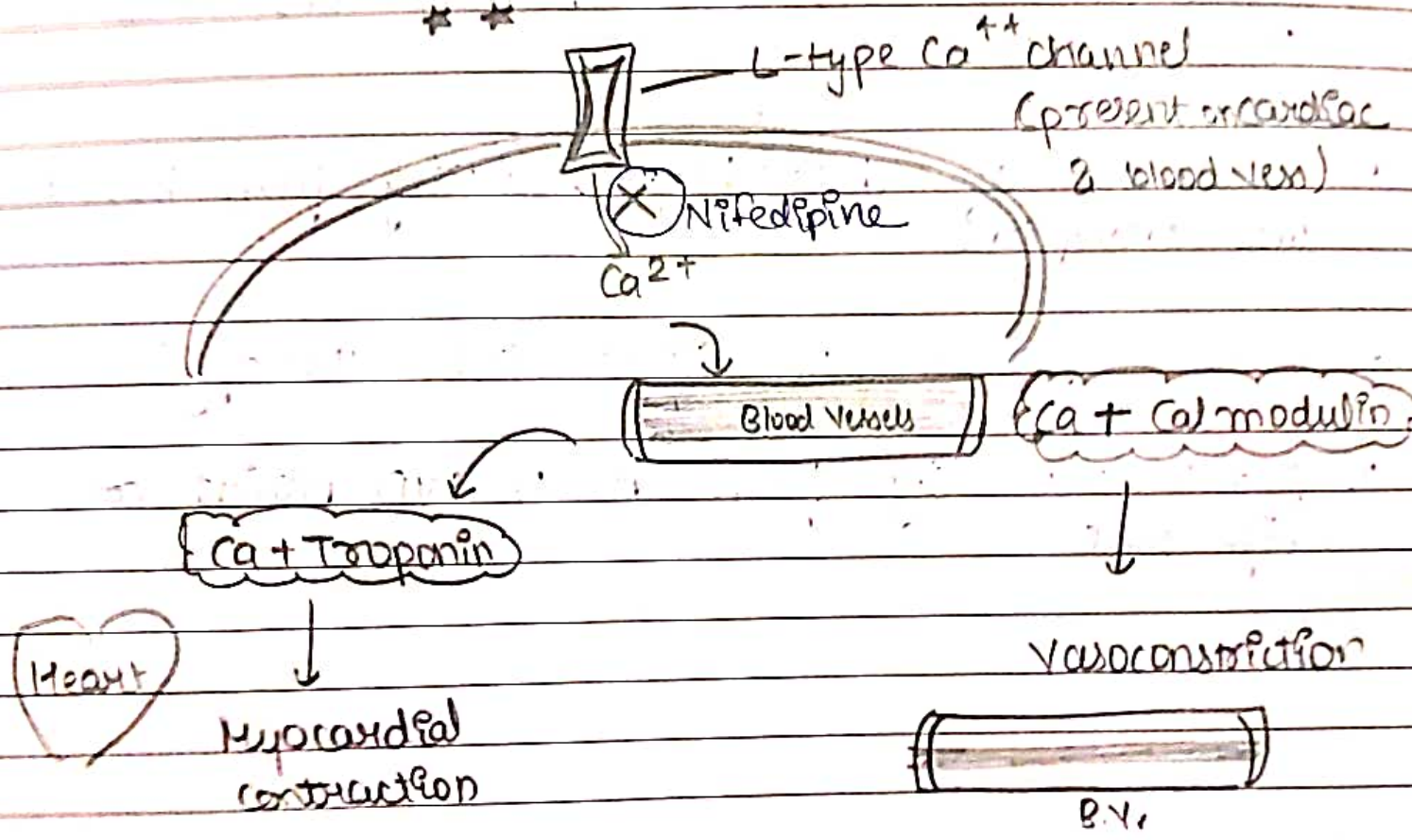
1. Treatment of type IIA & IIB hyperlipidemias
2. useful in pruritus in biliary obstruction
(↑ bile acid)
3. Treatment of diarrhea resulting from bile & mal-absorption.
- lowering plasma LDL. (first line therapy)
4. Reduce mortality from MI & CVD patient at high risk.

MDA

Amlodipine + Nifedipine (CCB) (non-cardios)

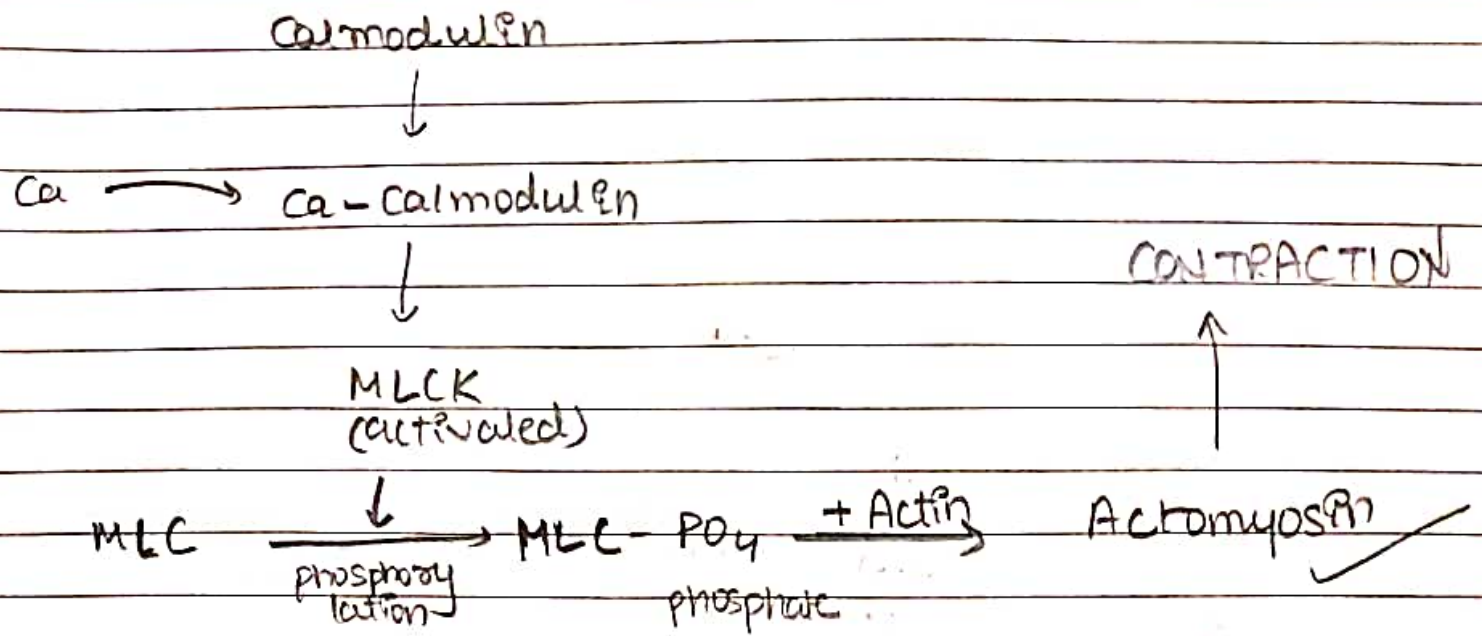
- Dihydro pyridine derivative

*** \rightarrow Ca^{++} ion



L-type on
(cardiac muscle)

L-type on
(Vascular sm muscle)



Therapeutic uses-

1. Angina - ↓ in myocardial oxy consumption & dilation of C. arteries.
2. Arrhythmia - depressant action on S-A & AV node
3. Hypert - control bp by vasodilatory effect.
4. Migraine
5. Left ventricular hypertrophy (enlargement of organ)
6. HF
7. Atrial fibrillation (irreg & rapid heart rhythm)
(faster - upper chamber beat too quickly)