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Department of Health Research
Ministry of Health and Family Welfare, Government of India

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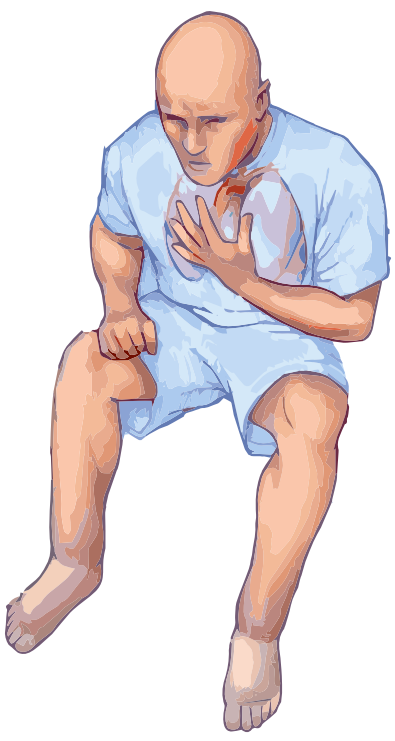
# Standard Treatment Workflow (STW)
# ST ELEVATION MYOCARDIAL INFARCTION (STEMI)
## ICD-11-BA41.0



**CONSIDER ANGINA IF**
- Diffuse retrosternal pain, heaviness or constriction
- Radiation to arms or neck or back
- Associated with sweating
- Easily reproduced with post-meal exertion
- Consider atypical presentation: Exertional fatigue or breathlessness or profuse sweating or epigastric discomfort/ syncope

More likelihood if known patient of CAD/ multiple risk factors

**ACUTE CORONARY SYNDROME:**

1. Angina at rest or lasting more than 20 minutes
2. Recent worsening of stable angina (crescendo) to CCS class III
3. New onset effort angina of less than 1 month in CCS class II/ III
4. Post infarction angina

ECG: If ST Elevation: Follow ST Elevation MI (STEMI) protocol
If no ST Elavation: UA/NSTEMI

**ANGINA UNLIKELY IF:**

| | | | | | |
|---|---|---|---|---|---|
| Variable location or characteristic | Long lasting (hours to days) or short lasting (less than a minute) | Restricted to areas above jaw or below epigatrium | Localized to a point | Pricking or piercing or stabbing type of pain | Precipitated by movement of neck or arms or respiration |

**LOOK FOR OTHER CAUSES OF CHEST PAIN (ONGOING OR WITHIN 12 HRS)**

- Unequal or absent peripheral pulses → Dissection of Aorta
- Respiratory evaluation → Pleuritis/ Pneumonitis/ embolism/ pneumothorax
- Pericardial rub
- Neuralgia or herpes

## PATIENT WITH STEMI WITHIN 12 HOURS

**ECG REVEALS ST ELEVATION MI**

Refer to primary angioplasty/ thrombolysis capable hospital

**GENERAL MEASURES**
1. Admit in ICU equipped with continuous ECG monitoring & defibrillation
2. Routine bio-chemistry and serial cardiac enzymes (troponin)
3. Pain relief by opioid
4. O2 if saturation less than 90%
5. Aspirin 325 mg, Clopidogrel 300 mg and Atorvastatin 80 mg/Rosuvastatin 20-40mg
6. Echocardiography, particularly for mechanical complication

**PCI CAPABLE HOSPITAL**
1. Proceed for PCI
2. Radial route preferred
3. Preferably within 90 minutes

**DURING PROCEDURE**
1. Use unfractionated heparin
2. No routine thrombosuction
3. Tackle culprit artery only unless shock
4. DES to be preferred

**POST PROCEDURE**
1. Continue dual antiplatelets for at least 1 year

**PCI INCAPABLE CENTRE**

A. Tranfer to PCI capable hospital if PCI can be performed within 120 min

B. If Transfer to PCI incapable hospital not feasible

**THROMBOLYSE**
1. Within 12 hours of symptom onset, if no contra-indication
2. Preferably with fibrin specific agent Tenecteplase/ TPA/ Reteplase or Streptokinase, if fibrin-specific are unavailable
3. Therapy to be started within 10 min preferably

**POST THROMBOLYSIS**
1. ECG to be done at 60-90 min after starting thrombolysis to assess whether thrombolysis is successful ( >50% ST settlement with pain relief) or not
2. If successful, transfer patient for PCI within 3-24 hours
3. If thrombolysis failed, transfer patient immediately for PCI capable hospital
4. Enoxaparin (preferred over unfractionated heparin) to be continued till PCI OR discharge

## PATIENT WITH STEMI IN 12-24 HOURS

| | |
|---|---|
| Transfer to PCI capable hospital immediately | If ongoing pain, thrombolysis and transfer immediately |

## PATIENT WITH STEMI AFTER 24 HOURS

Angiography with a view to PCI only if any of following/ Contra indications of angiography:

- Recurrent anginal pain not controlled by medical therapy
- Cardiogenic shock
- Acute LVF
- Mecahnical complication
- Dynamic ST-T changes
- Life threatening ventricular arrhythmias

## ABSOLUTE CONTRA-INDICATIONS TO THROMBOLYIC THERAPY:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Previous intra-cerebral hemorrhage or stroke of unknown etiology | Ischemic stroke in last 6 months | CNS neoplasm or AV malformation | Recent (within 1 month) major trauma/ surgey/ head injury | Recent (within 1 month) major GI bleed | Known bleeding tendency (except menstrual bleed) | Aortic dissection | Severe uncontrolled hypertension |

## DRUGS & DOSAGE

**Anti-platelets**
1. Aspirin: Loading dose 325 mg followed by 75 mg OD
2. Clopidogrel: Loading dose 300 mg followed 75 mg OD
3. Prasugrel: Loading dose 60 mg followed by 10 mg OD
4. Ticagralor: Loading dose 180 mg followed by 90 mg BD

**Anti-ischemic:**
Metoprolol:
Short acting: 25-100 mg BD
Long acting: 25 -100 mg OD
Nitrates:
Isosorbide mono-nitare 20 to 60 mg in 2 divided dose
Nitroglycerine sustained release 2.6 to 6.5 mg BD
Nitroglycerine IV 5-25 mcg/ min infusion

**Lipid lowering agents:**
High dose Atorvastatin 80 mg OD
Rosuvastatin 20-40mg OD
Non-statin lipid modifying agents

**Ace-inhibitor**
Ramipril 2.5 -10 mg OD
Enalapril 2.5 -10mg BD

**Oxygen:**
If oxygen saturation below 90%

**Morphine:**
Titrated in a dose of 2-4 mg IV every 15 minutes

**Beta-blocker:**
Oral beta-blocker if LVEF is less than 40%

**Anti thrombotics:**
1. Unfractionated heparin: Bolus of 60 U/Kg (maximum 5000 U) followed by 12 U/Kg hourly infusion to maintain APTT at 50-70 sec
2. Enoxaparin: 1 mg/Kg SC 12 hrly

**Thrombolytic Therapy:**

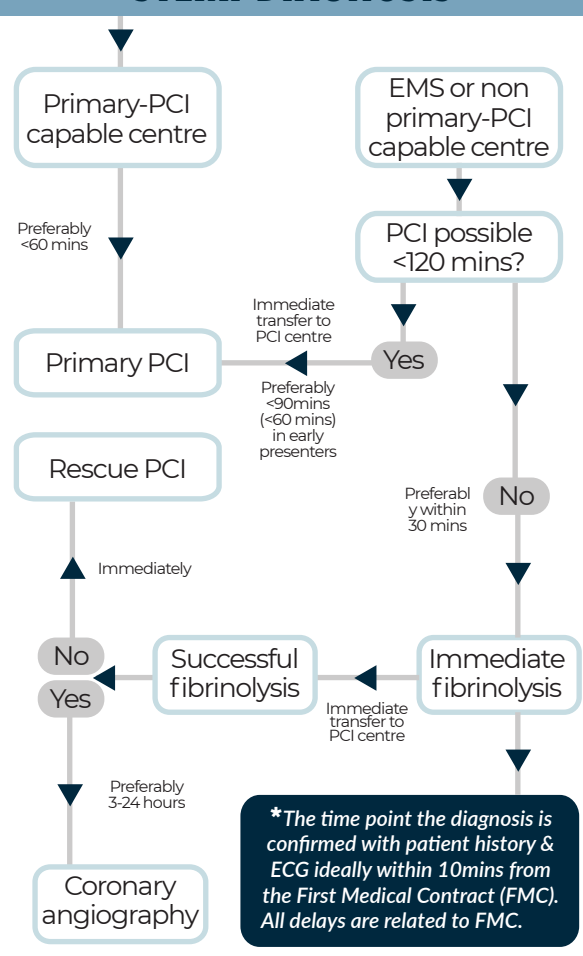
**Tenecteplase**
35 mg IV bolus if 60-70 Kg
40 mg IV bolus if 70-80 Kg
45 mg IV bolus if more than 80 Kg

**Reteplase**
10 mg IV bolus, repeat after 30 min

**Alteplase**
15 mg IV bolus followed by 0.75 mg/Kg over 30 min upto 50 Kg weight, then 0.5 mg/Kg over 60 min up to 35 mg

**Streptokinase**
1.5 million units IV over 60 min

## STEMI DIAGNOSIS*




## REFERENCES


1. 1. Byrne RA et al. 2023ESC guidelines for the management of acute coronary syndrome. European Heart J (2024) 44, 3720-3826
2. 2. Rao SV et al. 2025 ACC/AHA/ACEP/NAEMSP/SCAI guidelines for the management of acute coronary syndrome. J Am Coll Cardiol(2025) 85, 2135-2237


## MISSION: LIFELINE

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (**stw.icmr.org.in**) for more information.