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

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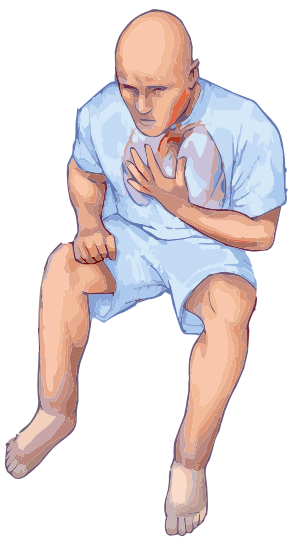
Standard Treatment Workflow (STW) for the Management of
ST ELEVATION MYOCARDIAL INFARCTION (STEMI)
ICD-10-I21.3



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

PATIENT WITH STEMI WITHIN 12 HOURS

ECG REVEALS ST ELEVATION MI*

Refer to primary angioplasty/ thrombolysis capable hospital

*Includes new onset LBBB

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
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 capable 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

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 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

Statins:
High dose Atorvastatin 80 mg OD

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

Thrombolyic Therapy:

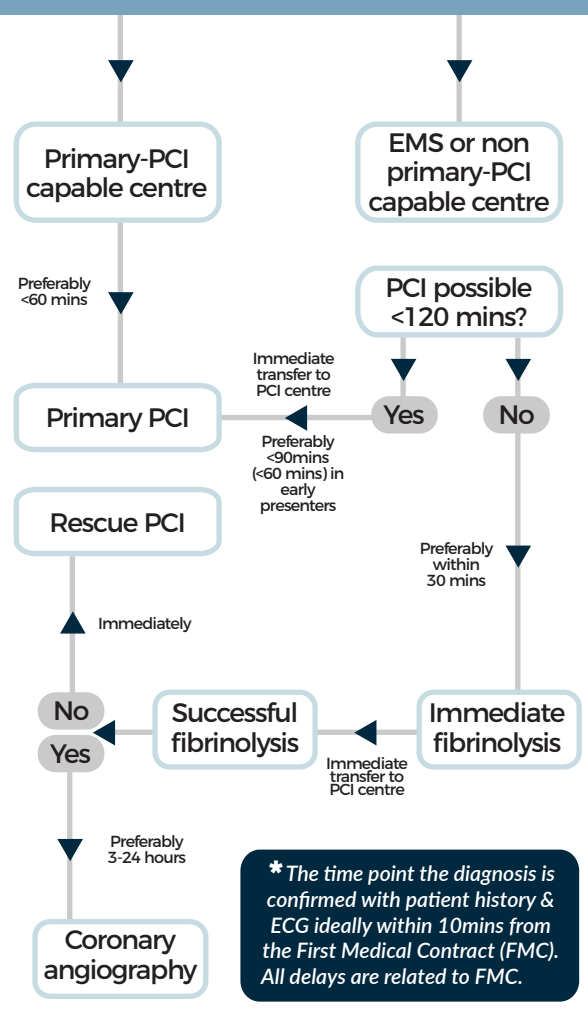
Tenecteplase
35 mg IV bolus if 60-70 Kg
40 mg IV bolus if 70-80 Kg
45 mg IV bolus if more than 80 Kg

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*



*The time point the diagnosis is confirmed with patient history & ECG ideally within 10mins from the First Medical Contract (FMC). All delays are related to FMC.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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.