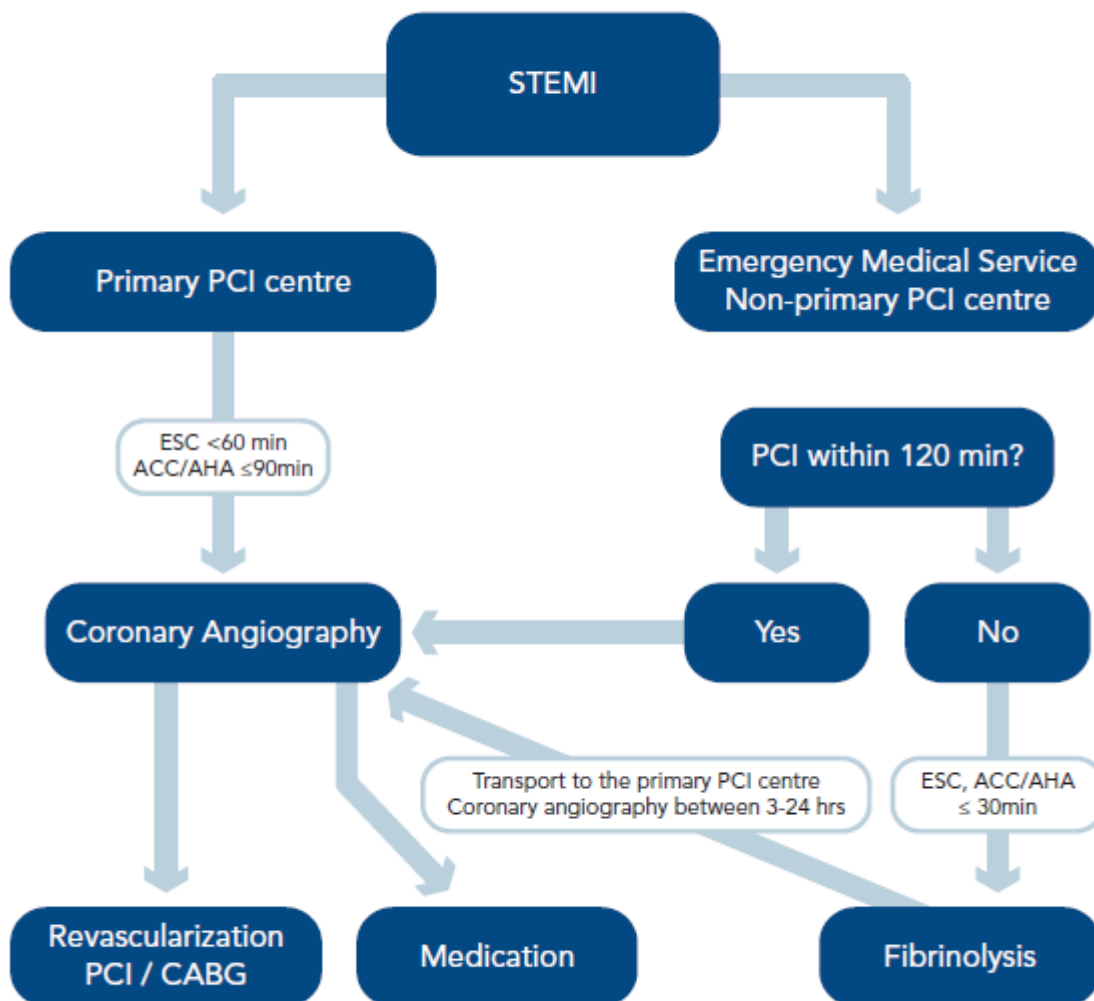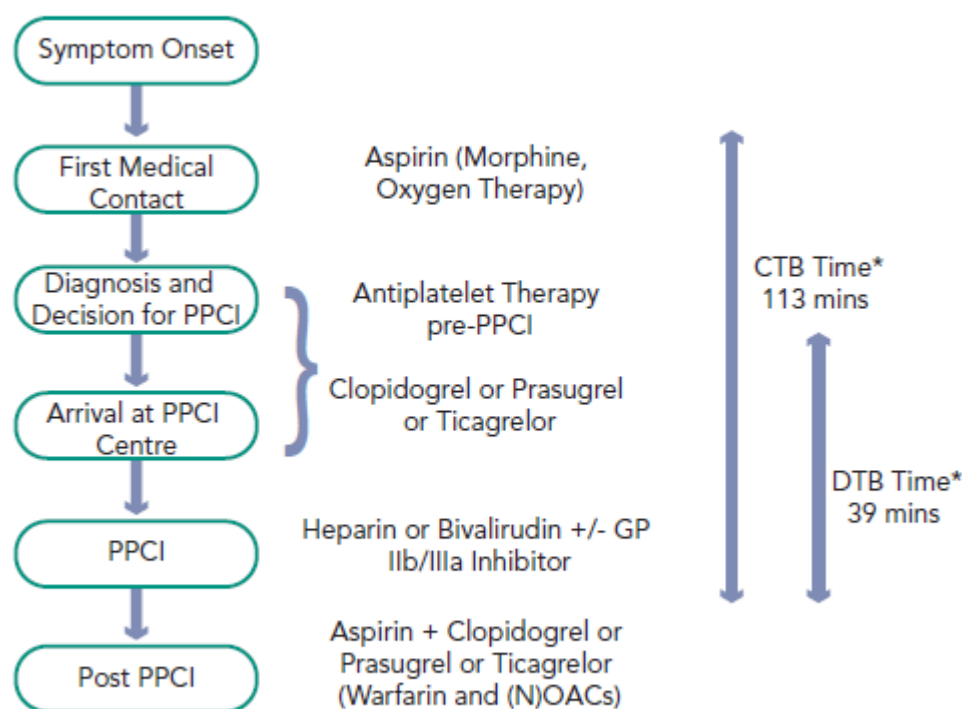# Clinical Process Map for Acute STEMI

Figure 1: Timelines in the European Society of Cardiology and American College of Cardiology/American Heart Association ST-segment Elevation Myocardial Infarction Guidelines

ACC = American College of Cardiology; AHA = American Heart Association; CABG = coronary artery bypass grafting; ESC = European Society of Cardiology; PCI = percutaneous coronary intervention; STEMI = ST-segment myocardial infarction.

Figure 1: Timeline of a STEMI Patient Requiring PPCI and Pharmacotherapy Options

Symptom Onset

First Medical Contact

Aspirin (Morphine, Oxygen Therapy)

Diagnosis and Decision for PPCI

Antiplatelet Therapy pre-PPCI

Clopidogrel or Prasugrel or Ticagrelor

Arrival at PPCI Centre

CTB Time* 113 mins

DTB Time* 39 mins

PPCI

Heparin or Bivalirudin +/- GP IIb/IIIa Inhibitor

Post PPCI

Aspirin + Clopidogrel or Prasugrel or Ticagrelor (Warfarin and (N)OACs)

*Median times based on British Cardiovascular Intervention Society Audit Returns 2013. CTB = call to balloon; DTB = door to balloon; GPIIb/IIIa = glycoprotein IIb/IIIa; (N)OAC = non-vitamin K antagonist oral anticoagulants; PPCI = primary percutaneous coronary intervention.

Concept Sets

- Concept sets for acute STEMI based on ICD code: `stemi-concepts.json`

- Concept set for cardiac catheterization +/- stent (drug-eluting stent or bare metal stent): `pci-w-or-wo-stent.json`

  - all should occur within 0-1 days of encounter patient (technically within 60-90 mins of encounter start)

  - preceded by the following **loading** doses:

    - treated with Aspirin ≥ 162 mg dose (typical doses are 162, 324 or 325)

    - treated with either loading dose of a P2Y12 inhibitor:

      - Prasugrel 60 mg

      - Cangrelor 30 μg/kg bolus

      - Ticagrelor 180 mg

- Clopidogrel 600 mg
- Concept set for ST elevation: `STE-on-ecg.json`
    - These are observations of STE from ECG readings
- Concept set for Troponin elevation
    - Measurements: `trop-elevated-meas.json`
        - Positive if Lab value > 99th URL
    - Actual observation of 'Troponin elevation' or 'Cardiac troponin positive': `trop-elevated-conditions.json`

Cohort Definitions

- ICD Codes *only* for acute STEMI
    - Limiting to ICD 10 codes
- ICD Code + Keyword search
    - Discharge summaries: Case-insensitive `STEMI` or case-insensitive `ST*elevat` or case-insensitive `ST*segment`, where `*` is a wild-card character that can take on any value. (Somani et al., 2022)
- Keyword search *only*
- UDMI Definition of STEMI: ST elevation on ECG + Troponin elevation
    - Where encounter diagnosis is NOT pericarditis, myocarditis, Takotsubo cardiomyopathy, spontaneous coronary artery dissection, NSTEMI, prinzmetal's angina, pulmonary embolism
    - Recall, all of this should occur within 0-1 days of encounter start
- Chest Pain/Angina + ST elevation on ECG + Troponin elevation + (PCI +/- stent concept set)
- ST elevation on ECG + Troponin elevation + (PCI +/- stent concept set)
    - Above minus the 'Chest pain/Angina' bit to see if we can catch folks with 'atypical angina' or 'silent MI' better. These often include women, diabetic patients, and post-op patients.

- (PCI +/- stent concept set) + Echocardiogram order + ICU stay + cardiac rehabilitiation referral order

    - Rationale: Some patients may have ECG performed elsewhere (by EMS or transferred from another hospital)

    - ICU: 'Intensive care unit' (Concept code: '309904001'; use child concepts); some hospitals may have a dedicated 'Cardiac intensive care unit' (Concept code: 309907008)

    - Cardiac rehab: unsure if referral order observation will be seen during the acute STEMI encounter. May need to see if cardiac rehabilitation visits done within few weeks of discharge date.