

Management Algorithms For Acute ST Elevation Myocardial Infarction



Burden

- Acute myocardial infarction (MI) is associated with high mortality and among survivors have high morbidity.
- Globally, acute coronary syndromes (ACS) in the form of MI are responsible for almost 50% of all deaths related to cardiovascular disease.
- ACS also exerts high financial burden

Awareness

- Lay public and even primary physicians remain in denial about myocardial infarction.
- Patients frequently ignore signs and symptoms of MI.
- Even primary physician may fail to pay as much attention.
- Appropriate management including primary PCI are among the few therapeutic modalities that saves life

Current Challenges

- Wide disparity in the delivery of health-care from metropolitan cities, to urban center, semi-urban township to rural villages.
- Primary PCI is easily available in metro and urban areas.
- Suburban town hospitals may have limited availability of PCI capable centers
- Smaller hospitals in urban areas have
 - Fewer cardiologists responding to STEMI emergencies 24/7
 - Even fewer interventional cardiologists on call.

Approach to STEMI

- A clear guidance for STEMI management is essential for :
 - Emergency personnel,
 - Primary physician,
 - Even physicians in the local clinics and casualty services
- The guidance provided should be based on
 - Expert analysis of available data (on drugs, devices and strategies),
 - Careful dissection of risk benefit ratio of therapeutic modalities
 - Scrutiny of the cost of these strategies.

Methodology

- To Develop the STEMI management strategy
 - 9351 cardiologists and cardiologist physicians were contacted.
 - Out of them 62 physicians from diverse background responded.
 - An organized and directed approach was followed to thoroughly review evidence

Patients presenting within window period and out of window period

- A delay by the patient and primary physicians often contributes to patient presenting out of the window period (12 h after the chest pain)
- To address this issue an algorithm has been developed to manage patients presenting before 12 h and out of window period (after 12 h)

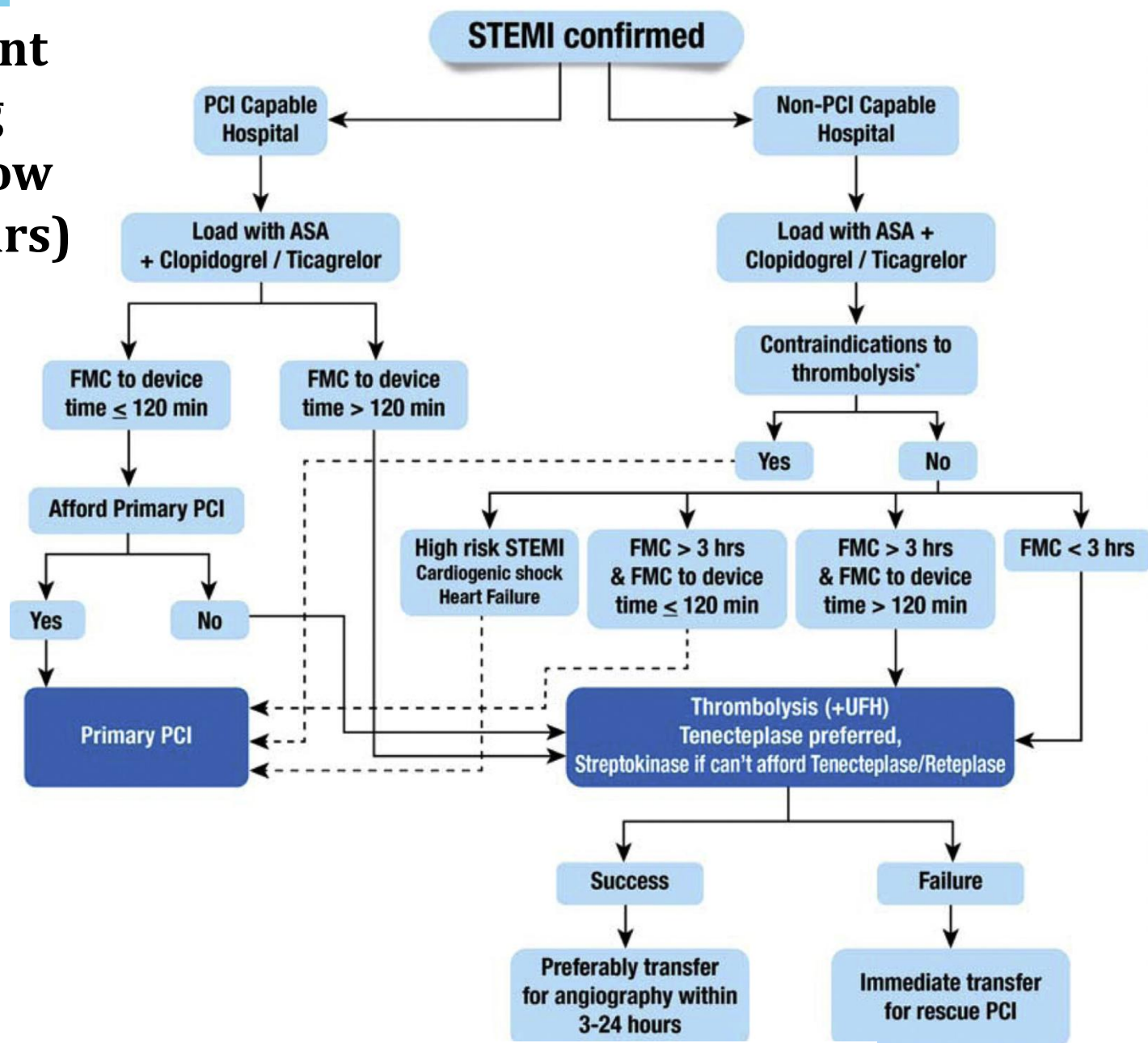
Patient with STEMI presenting within window period (before 12 hrs)

- A cut-off of 12 h is considered because maximum benefit of revascularization strategy occurs during this time period.
- Patients have been clearly categorized into PCI capable centers *versus* non PCI capable centers.
- Besides considering transfer times or other delays, affordability is also considered (a particularly relevant issue in emerging economies).

Patient with STEMI presenting within window period (before 12 hrs)

- If patient presents to a non-PCI capable center:
 - The Golden Hour is stretched to 3 h, wherein thrombolysis may be the best option.
 - The transfer times and limited availability of cath labs especially in rural areas are also considered
 - Tissue plasminogen inhibitor (tenecteplase or alternately reteplase) is the preferred fibrinolytic agent
 - In far flung and resource compromised areas streptokinase is a reasonable alternative

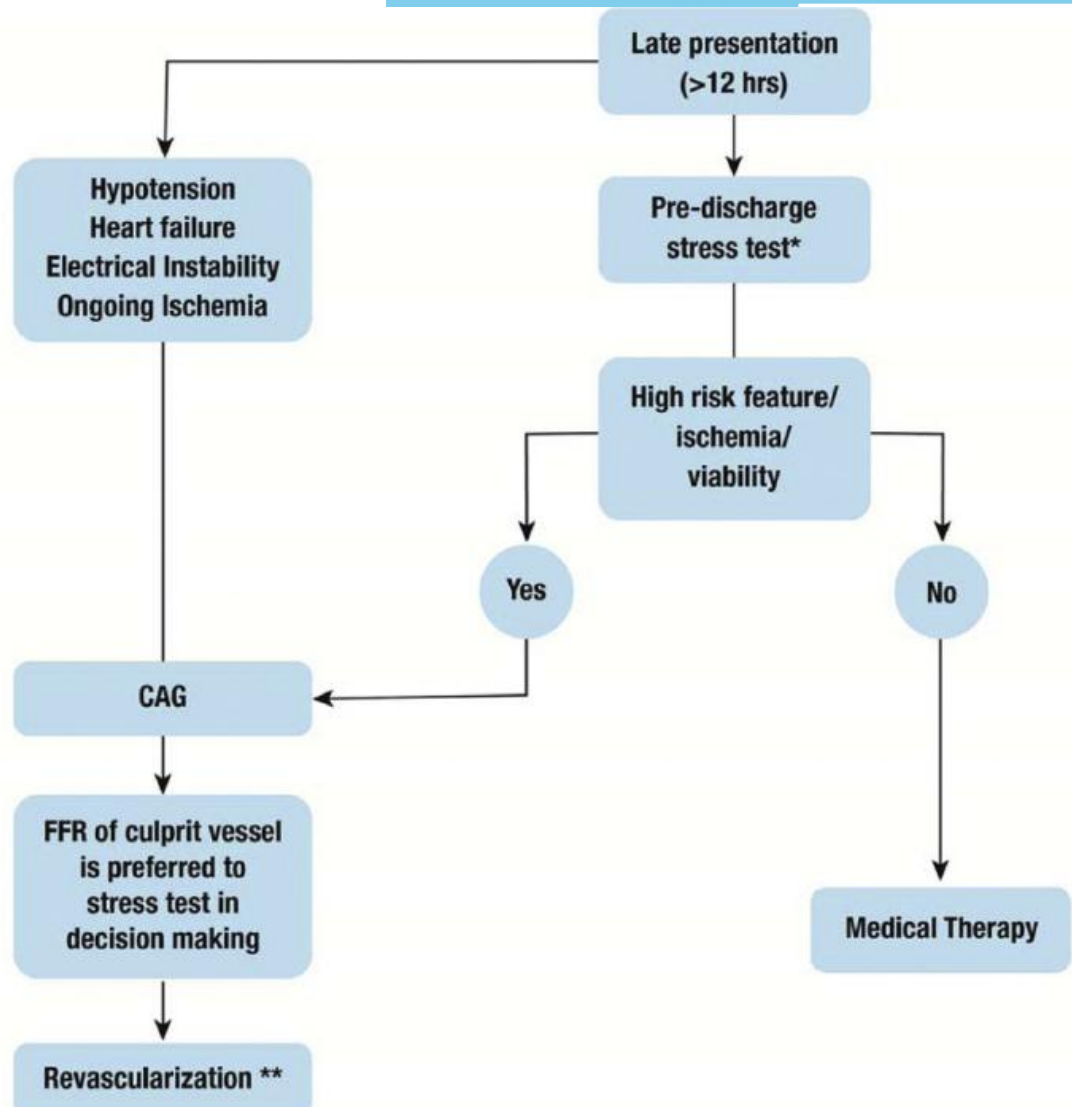
STEMI patient presenting within window period (<12 hrs)



Patient with STEMI presenting within window period (after 12 hrs)

- Out of window period protocol is a unique algorithm particularly
 - relevant to far flung areas,
 - low resource setting and
 - low education levels.
- Importance is given to demonstration of viability or ischemia rather than routine angiography
- To conserve monetary resources and use it in those situations where benefit is more as also avoid overuse of treatment.

Patient with STEMI presenting within window period after 12 hrs



An Angiogram may be considered in patients with large anterior wall MI and LV dysfunction EF < 40%. A revascularisation is appropriate if sub-total conclusion of IRA is seen. Revascularisation of a totally occluded IRA should warrant either ongoing ischemia or demonstration of viability.

*If stress testing is preferred, it should be Nuclear stress testing rather than stress ECG.

** For MV disease early/ staged PCI of non-IRA is preferred in the absence of shock.

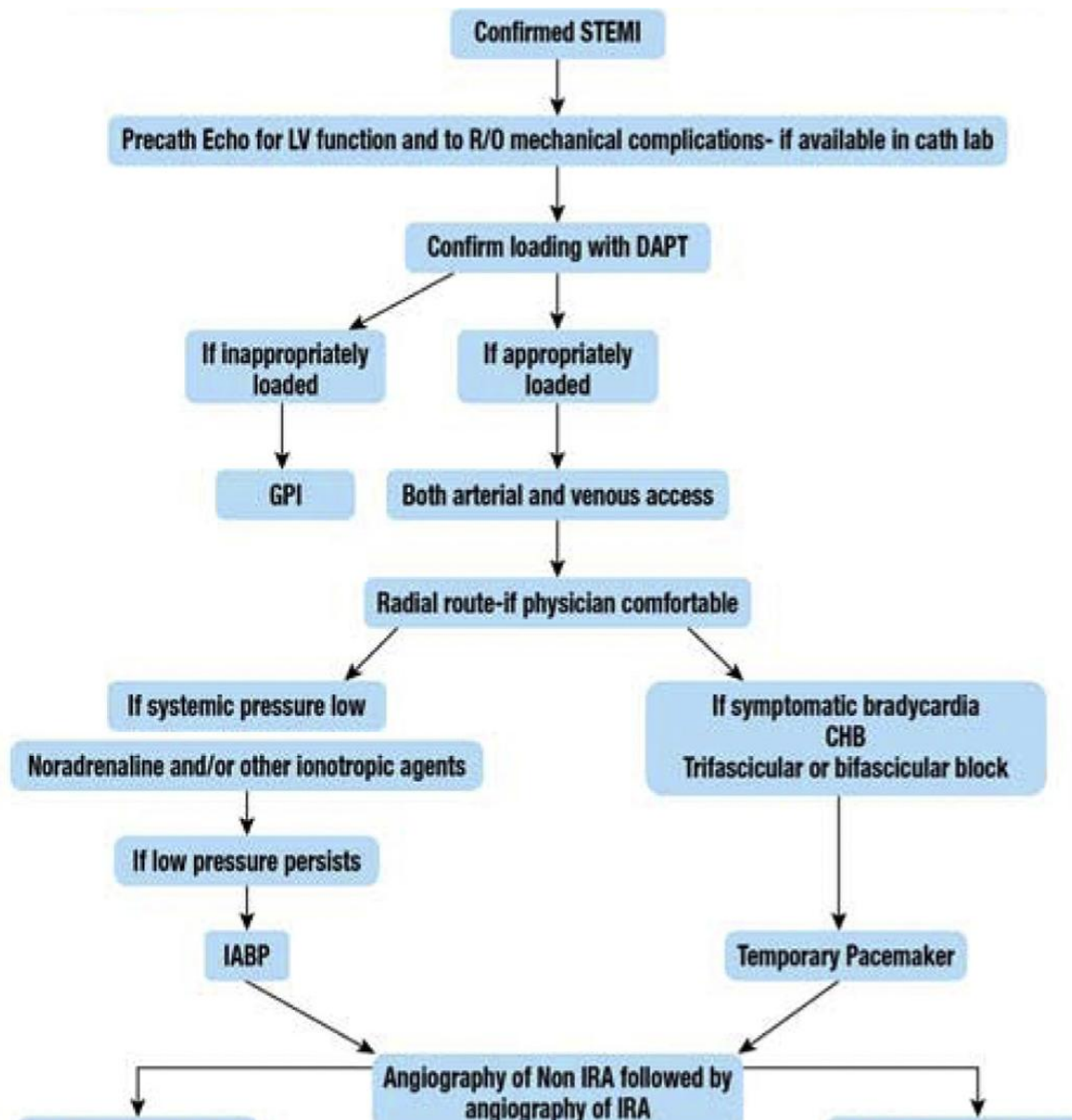
Primary PCI cath lab protocol

- Delayed PCI or rescue PCI standardized cath protocols, are very important.
- The algorithm highlights on complicated, high risk PCI procedures.
- Suggestions have been made depending on the hospital set-up.
- The protocol has been adapted to Indian practice environments

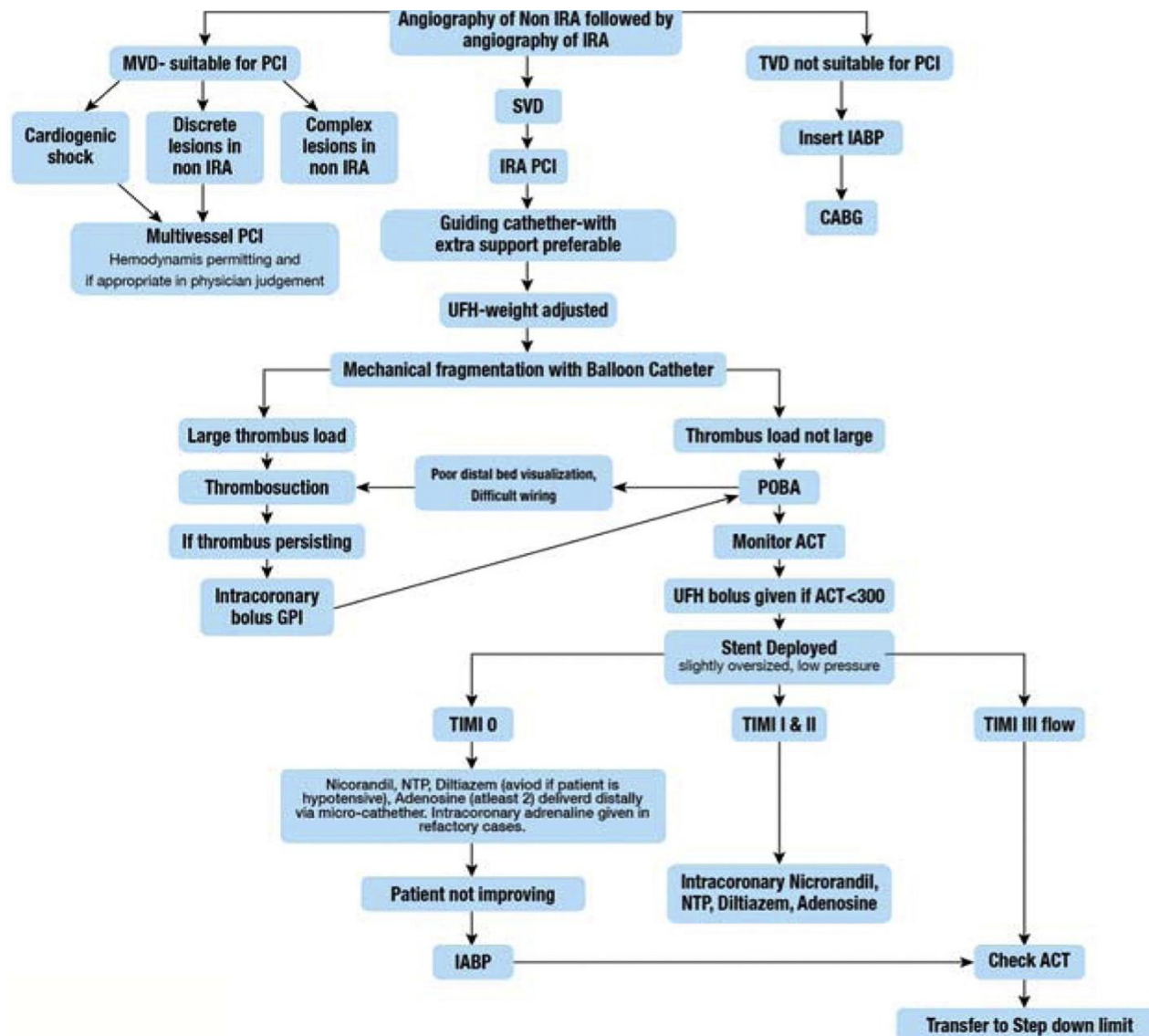
Primary PCI cath lab protocol

- Baseline echo examination is recommend while initiating the catheterization procedure
- It is recommend that hospital set-ups use this protocol to set up a standard inventory of
 - guiding catheters,
 - wires, and
 - a couple of balloons
- That could fit on one moveable cart, which can be dedicated to primary PCI program.

STEMI patient for Primary PCI- Cath lab protocol



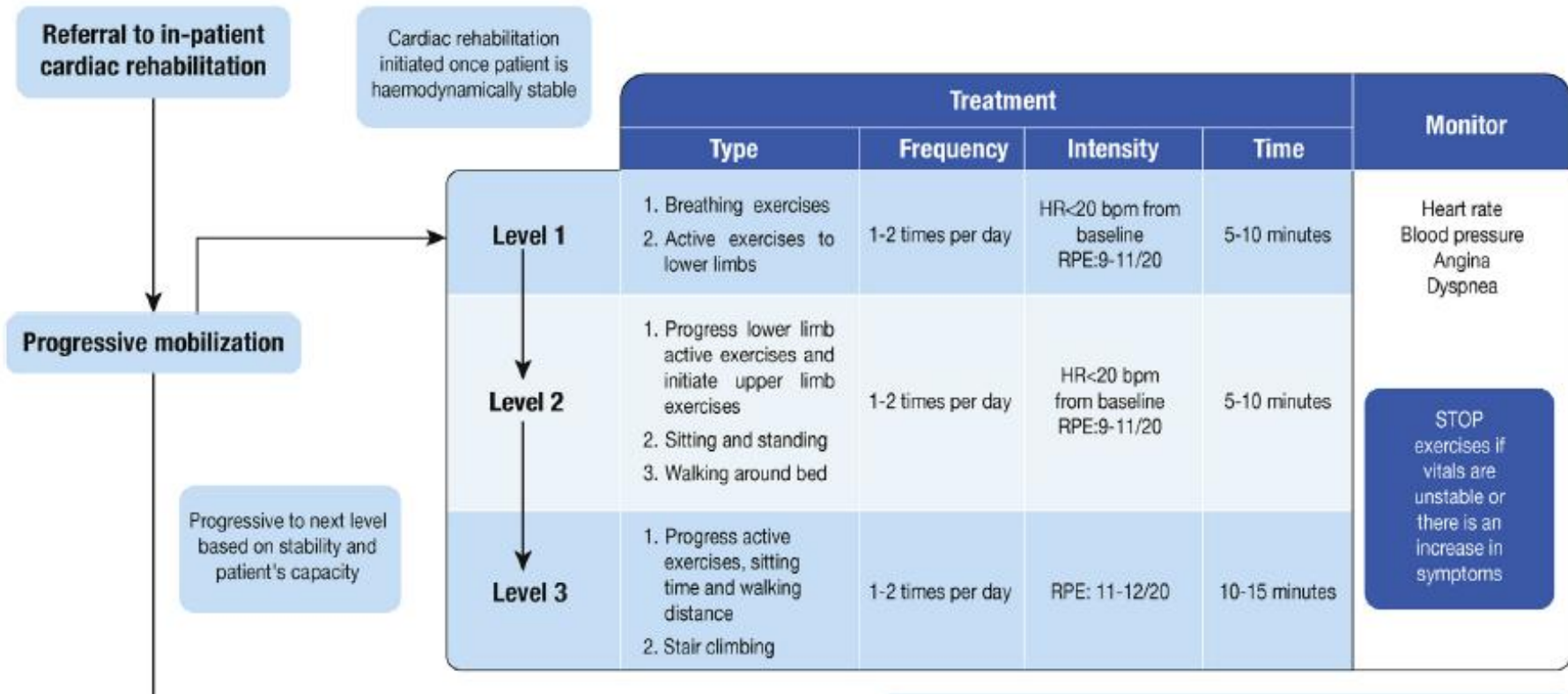
STEMI patient for Primary PCI- Cath lab protocol



Cardiac Rehabilitation

- Cardiac rehabilitation is an integral but often neglected component of post STEMI care.
- Even physicians are unaware of level of activity permitted after STEMI and the concept behind this protocol.
- A simple, scientific algorithm for post MI care and risk stratification keeping in mind low resource settings is presented

In-patient cardiac Rehabilitation following revascularization for acute coronary syndrome



In-patient cardiac Rehabilitation following revascularization for acute coronary syndrome

Progressive mobilization

Discharge evaluation

Referral to phase-2 cardiac rehabilitation

Assessment of core components

Evaluation of functional capacity

Risk Stratification

Institution based cardiac rehabilitation

Home based cardiac rehabilitation

Patient assessment: Physical activity counselling; Exercise training; Nutritional counselling; weight management; lipid management; Diabetes management; Hypertension management; Smoking cessation; Psychosocial management

Functional capacity evaluated during the six minute walk test

Low Risk	Moderate Risk	High Risk
• EF > 50 % • No complex ventricular dysrhythmia • Uncomplicated MI/ Coronary intervention • Normal Haemodynamic response • Asymptomatic • Functional Capacity > 7 METs	• EF 40-50 % • Symptomatic at moderate exercise levels or in recovery • ST depression < 2 mm during exercise or recovery	• EF < 40% • Cardiac arrest survivor • Complex ventricular dysrhythmia • Complicated MI or Coronary Intervention • Abnormal BP response • ST depression (> 2mm) • Symptomatic < 5 METs
• No depression		• Depression

Conclusion

- These algorithms have been developed considering the low resource and rural settings
- It shall be useful for decision making for STEMI patients within these practice environments.
- It shall help address issues of physician awareness and decision making and set up a standardized STEMI programs at various centers.
- It shall have a positive impact on many health-care delivery indices like mean door-to-balloon/needle time and even pain to door time.



Thank You