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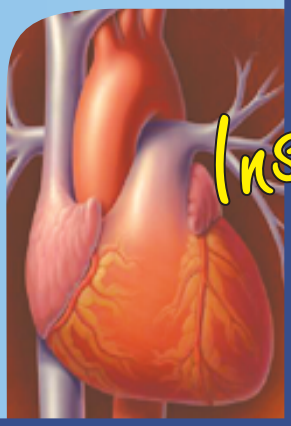

Insight HEART

Vol: 1 No: 3 ; 2005

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Update of Management of Acute ST-Elevation Myocardial Infarction

ESC/ACC DEFINITION OF MI

Either one of the following criteria satisfies the diagnosis for an acute, evolving, or recent MI:

1. Typical rise and gradual fall (troponin) or more rapid rise and fall (CK-MB) of biochemical markers of myocardial necrosis (see further description of 'Biochemical Marker Evidence or MI' below) with at least 1 of the following:
   a. Ischemic symptoms
   b. Development of pathological Q waves on the ECG
   c. ECG changes indicative of ischemia (ST-segment elevation or depression; for further description, see Classification of STEMI vs. Non-STEMI)
   d. Coronary artery intervention (e.g., coronary angioplasty)

Or

2. Pathological findings of an acute MI

Biochemical marker evidence of MI.

1. Troponin T or I: Maximal concentration of troponin T or I greater than the MI decision limit on at least 1 occasion during the first 24 hours after the index clinical event
2. CK-MB:
   a. Maximal value of CK-MB, preferably CK-MB mass, greater than upper limit of normal on 2 successive samples
   b. Maximal value of CK-MB greater than 2 times the upper limit of normal on 1 occasion during the first hours after the index clinical event

Or

3. Total CK: In the absence of availability of a troponin or CK-MB assay, total CK greater than 2 times the upper limit of normal, or the B fraction of CK may be used, but these last 2 biomarkers are considerably less satisfactory than CK-MB

Special circumstances (for all types of MI):

- For patients with admission MI, the CK-MB value associated with the recurrent MI must be increased by at least 50% of the previous value (i.e., a re-elevation of cardiac markers)
- For patients with MI -within 24 hours after PCI, the CK-MB (or CK if MB not available) must be greater than or equal to 3 times the upper limit of normal. No ECG changes or symptoms are required.
- For patients, with MI within 24 hours after CABG, the CK-MB (or CK. if MB not available) must be greater than or equal to 5 times the upper limit of normal, and new Q.waves must be present, or CK-MB value must be greater than or equal to 10 times the upper limit of normal (with or without Q waves). No symptoms are required.

Classification of ST-elevation MI(STEMI) vs. non-STEMI

The patient should manifest a typical rise and gradual fall (troponin) or more rapid rise and fall (CK-MB) of biochemical markers of myocardial necrosis (see 'Biochemical marker evidence of MI" above),

and

1. STEMI: New or presumed new ST-segment elevation at the J point in 2 or more contiguous leads with the cutoff points greater than or equal to 0.2 mV in leads VI, V2, or V3, or greater than or equal to 0.1 mV in other leads

Or

2. NSTEMI. Either of the following (in the absence of ST elevation):
   a. ST-segment depression or T-wave abnormalities
   b. Ischemic symptoms in the presence or absence of chest discomfort. Ischemic symptoms may include:
      1. unexplained nausea and vomiting or diaphoresis
      2. persistent shortness of breath secondary to LVF

Or

3. BBB/uncertain type: Either of the following:
   a. Left BBB (new or old) or paced rhythm that obscures assessment of ST elevation. (If definite new ST elevation can be identified compared with an old ECG, then STEMI should be the classification.)
   b. If the initial ECG findings are not available or the patient presents beyond the time of ST-segment changes (e.g., greater than 24 hours), classify as uncertain type.

MANAGEMENT OF STEMI

A. Prehospital Issues

Reperfusion in patients with STEMI can be accomplished by the pharmacological (fibrinolysis) or catheter-based [primary percutaneous coronary intervention (PCI)] approaches. Implementation of these strategies varies based on the mode of transportation of the patient and capabilities at the receiving hospital. Transport time to the hospital is variable from case to case, but the goal is to keep total ischemic time within 120 minutes.

There are 3 possibilities:

(1) If EMS has fibrinolytic capability and the patient qualifies for therapy, prehospital fibrinolysis should be started within 30 minutes of EMS arrival on scene.

(2) If EMS is not capable of administering prehospital fibrinolysis and the patient is transported to a non-PCI-capable hospital, the hospital door-to-needle time should be within 30 minutes for patients in whom fibrinolysis is indicated.

(3) If EMS is not capable of administering prehospital fibrinolysis and the patient is transported to a PCI-capable hospital, the hospital door-to- balloon time should be within 90 minutes.

Interhospital transfer: It is appropriate to consider emergency interhospital transfer of the patient to a PCI-capable hospital for mechanical revascularization if (1) there is a contraindication to fibrinolysis; (2) PCI can be initiated promptly (within 90 minutes after the patient presented to the initial receiving hospital or within 60 minutes compared to when fibrinolysis with a fibrin-specific agent could be initiated at the initial receiving hospital); or (3) fibrinolysis is administered and is unsuccessful (i.e., "rescue PCI"). Secondary nonemergency interhospital transfer considered for recurrent ischemia.

B. Initial Recognition and Management in the Emergency Department

Initial diagnosis of acute myocardial infarction

- History of chest pain / discomfort.
- ST-segment elevations or (presumed) new left bundle-branch block on admission ECG. Repeated ECG recordings often needed,
- Elevated markers of myocardial necrosis (CK-MB, troponins). One should not wait for results to initiate reperfusion treatment!
- 2D echocardiography and perfusion scintigraphy helpful to rule out acute myocardial infarction.

Initial Recognition and Management in the Emergency Department (Fig:1)

Assesment of repurfusion options (Table 1 & 2)

Recommendations for Primary PCI

General Considerations:

Class I:

1.If immediately available, primary PCI should be performed in patients with STEMI (including true posterior MI) or MI with new or presumably new left bundle-branch block (LBBB) who can undergo PCI of the infarct artery within 12 hours of symptom onset, if performed in a timely fashion (balloon inflation within 90 minutes of presentation) by persons skilled in the procedure (individuals who perform more than 75 PCI procedures per year). The procedure should be supported by experienced personnel in an appropriate laboratory (one that performs more than 200 PCI procedures per year, of which at least 36 are primary PCI for STEMI, and that has cardiac surgery capability). (Level of Evidence: A)

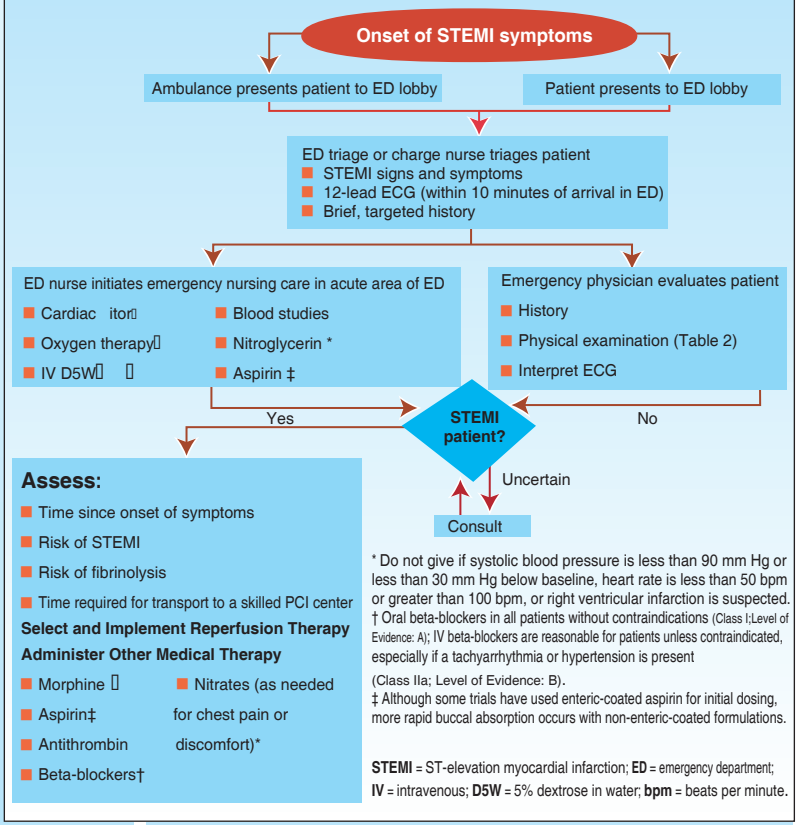
Specific Considerations:

a. Primary PCI should be performed as quickly as possible, with the goal of a medical contact-to-balloon or door-to-balloon time of within 90 minutes.(Level of Evidence: B)

b. If the symptom duration is within 3 hours and the expected door-to-balloon time minus the expected door-to-needle time is:

- within 1 hour, primary PCI is generally preferred (Level of Evidence: B)

Figure 1. Emergency Algorithm/Protocol for Patients With Symptoms and Signs of STEMI



* Do not give if systolic blood pressure is less than 90 mm Hg or less than 30 mm Hg below baseline, heart rate is less than 50 bpm or greater than 100 bpm, or right ventricular infarction is suspected.
† Oral beta-blockers in all patients without contraindications (Class I;Level of Evidence: A); IV beta-blockers are reasonable for patients unless contraindicated, especially if a tachyarrhythmia or hypertension is present (Class IIa; Level of Evidence: B).
‡ Although some trials have used enteric-coated aspirin for initial dosing, more rapid buccal absorption occurs with non-enteric-coated formulations.

STEMI = ST-elevation myocardial infarction; **ED** = emergency department; **IV** = intravenous; **D5W** = 5% dextrose in water; **bpm** = beats per minute.

Table 1. Reperfusion Checklist for Evaluation of the Patient With STEMI

Step One

Has the patient experienced chest discomfort for greater than 15 min and less than 12 hours?

Step Two

Yes / No → Stop

Are there contraindications to fibrinolysis?

Step Three

Does the patient have severe heart failure or cardiogenic shock such that PCI is preferable?

- greater than 1 hour, fibrinolytic therapy (fibrin-specific agents) is generally preferred. (Level of Evidence: B)

c. If symptom duration is greater than 3 hours, primary PCI should be performed with a medical contact-to-balloon or door-to-balloon time as brief as possible, with a goal of within 90 minutes. (Level of Evidence: B)

d. Primary PCI should be performed for patients less than 75 years old with ST elevation or LBBB who develop shock within 36 hours of MI and are suitable for revascularization that can be performed within 18 hours of shock, unless further support is futile because of the patient's wishes or contraindications/unsuitability for further invasive care. (Level of Evidence: A)

e. Primary PCI should be performed in patients with severe congestive heart failure and/or pulmonary edema (Killip class 3) and onset of symptoms within 12 hours. The medical contact-to-balloon or doorto- balloon time should be as short as possible, with a goal of within 90 minutes. (Level of Evidence: B)

Table 2. Assessment of Reperfusion Options for Patients With STEMI

Step 1: Assess Time and Risk

- **Time since onset of symptoms**
- **Risk of STEMI**
- **Risk of fibrinolysis**
- **Time required for transport to a skilled PCI laboratory**

Step 2: Determine Whether Fibrinolysis or an Invasive Strategy Is Preferred

If presentation is less than 3 hours and there is no delay to an invasive strategy, there is no preference for either strategy

Fibrinolysis is generally preferred if:

- **Early presentation** (less than or equal to 3 hours from symptom onset and delay to invasive strategy; see below)
- **Invasive strategy is not an option**
  - Catheterization laboratory occupied / not available
  - Vascular access difficulties
  - Lack of access to a skilled PCI laboratory † ‡
- **Delay to invasive strategy**
  - Prolonged transport
  - (Door-to-Balloon) . (Door-to-Needle) time is more than 1 hour * §
  - Medical contact.to-balloon or door-to-balloon time is more than 90 minutes

Invasive strategy is generally preferred if:

- **Skilled PCI laboratory † ‡ available with surgical backup**
  - Medical contact.to-balloon or doorto-balloon is less than 90 minutes
  - (Door-to-Balloon) . (Door-to-Needle) is less than 1 hour *
- **High risk from STEMI**
  - Cardiogenic shock
  - Killip class is greater than or equal to 3
- **Contraindications to fibrinolysis,** including increased risk of bleeding and intracranial hemorrhage
- **Late Presentation**
  - The symptom onset was more than 3 hours ago
- **Diagnosis of STEMI is in doubt**

STEMI = ST-elevation myocardial infarction; PCI = percutaneous coronary intervention.
* Applies to fibrin-specific agents.
† Operator experience greater than a total of 75 primary PCI cases per year.
‡ Team experience greater than a total of 36 primary PCI cases per year.
§ This calculation implies that the estimated delay to implementation of the invasive strategy is more than 1 hour versus immediate initiation of fibrinolytic therapy with a fibrin-specific agent.

Class IIa

1. Primary PCI is reasonable for selected patients 75 years or older with ST elevation or LBBB who develop shock within 36 hours of MI and are suitable for revascularization that can be performed within 18 hours of shock. Patients with good prior functional status who are suitable for revascularization and agree to invasive care may be selected for an invasive strategy. (Level of Evidence: B)
2. It is reasonable to perform primary PCI for patients with onset of symptoms within the prior 12 to 24 hours and one or more of the following:

a. severe congestive heart failure (Level of Evidence: C)

b. hemodynamic or electrical instability (Level of Evidence: C)

c. persistent ischemic symptoms. (Level of Evidence: C)

Class IIb

1. The benefit of primary PCI for STEMI patients eligible for fibrinolysis is not well established when performed by an operator who performs fewer than 75 PCI procedures per year. (Level of Evidence: C)

Class III

1. Primary PCI should not be performed in a noninfarct artery in patients without hemodynamic compromise. (Level of Evidence: C)
2. Primary PCI should not be performed in asymptomatic patients more than 12 hours after onset of STEMI if they are hemodynamically and electrically stable. (Level of Evidence: C)

Comparison of Fibrinolytic Agents (Table-3)

All of the fibrinolytic agents currently available and under investigation are plasminogen activators. They work enzymatically, directly or indirectly, to expose the active enzymatic center of plasmin. Some comparative features of the approved fibrinolytic agents for intravenous therapy are presented in Table 3. Data from GUSTO-I and GUSTO-III suggest that accelerated alteplase and

Table 3. Comparison of Approved Fibrinolytic Agents

	Streptokinase	Alteplase	Reteplase	Tenecteplase-tPA
Dose	1.5 MU over 30-60 min	Up to 100 mg in 90 min (based on weight)*	10 U x 2 each over 2 min	30-50 mg based on weight †
Bolus administration	No	No	Yes	Yes
Antigenic	Yes	No	No	No
Allergic reactions (hypotension most common)	Yes	No	No	No
Systemic fibrinogen depletion	Marked	Mild	Moderate	Minimal
90-min patency rates, approximate %	50	75	7	75 (380)
TIMI grade 3 flow, %	32	54	60	63
Approximate cost	$613	$2974	$2750	$2833 for 50 mg

MU = mega units.
* Bolus 15 mg, infusion 0.75 mg/kg times 30 minutes (maximum 50 mg), then 0.5 mg/kg not to exceed 35 mg over the next 60 minutes to an overall maximum of 100 mg.
† Thirty milligrams for weight less than 60 kg; 35 mg for 60-69 kg; 40 mg for 70-79 kg; 45 mg for 80-89 kg; 50 mg for 90 kg or more.

reteplase (administered as a double bolus) with intravenous heparin are effective therapies for achieving early coronary reperfusion and may provide an advantage over streptokinase; however, both are substantially more expensive and confer a slightly greater risk of ICH. Thus, the cost-benefit ratio is most favorable for alteplase or reteplase in patients who present early after onset of chest pain or symptoms and in those with a large area of injury (e.g., anterior infarction) and at low risk of ICH. In ASSENT-2, weight-adjusted TNK-tPA (tenecteplase) and alteplase were compared in 16,949 patients. Covariate-adjusted 30-day mortality was virtually identical (i.e., 6.18% for tenecteplase and 6.15% for alteplase), which met the predefined criteria for equivalence. The rates of ICH were also similar (i.e., 0.93% for tenecteplase and 0.94% for alteplase), but in patients receiving tenecteplase, there were fewer systemic mild-to-moderate bleeding complications (26.3% versus 28.95%, p equals 0.0003) and less requirement for blood transfusion (4.25% versus 5.49%, p equals 0.0002).

Contraindications and Cautions for Fibrinolysis in STEMI (Table-4)

HOSPITAL MANAGEMENT

1. Condition: Serious

2. **IV: NS or D5W** to keep vein open. Start a second IV if IV medication is being given. This may be a heparin lock.
3. **Vital signs:** Every 30 minutes until stable, then every 4 hours and as needed. Notify physician if HR is less than 60 bpm or greater than 100 bpm, systolic BP is less than 100 mm Hg or greater than 150 mm Hg, respiratory rate is less than 8 or greater than 22.
4. **Monitor**: Continuous ECG monitoring for arrhythmia and ST-segment deviation.
5. **Diet:** NPO except for sips of water until stable. Then start diet with 2 g of sodium per day, low saturated fat (less than 7% of total calories/day), low cholesterol (less than 200 mg/day), such as Therapeutic Lifestyle Changes (TLC) diet.
6. **Activity**: Bedrest and bedside commode and light activity when stable.
7. **Oxygen**: Continuous oximetry monitoring. Nasal cannula at 2 L /min when stable for 6 hours, reassess for oxygen need (i.e., O2 saturation less than 90%), and consider discontinuing oxygen.

8. Medications:

a. Nitroglycerin

1. Use sublingual NTG 0.4 mg every 5 minutes as needed for chest pain or discomfort.
2. Intravenous NTG for CHF, hypertension, or persistent ischemia that responds to nitrate therapy.

b. Aspirin

1. If aspirin not given in the ED, chew non-enteric-coated aspirin† 162 to 325 mg.
2. If aspirin has been given, start daily maintenance of 75 to 162 mg. May use enteric-coated aspirin for gastrointestinal protection.

c. Beta-Blocker

1. If not given in the ED, assess for contraindications, i.e., bradycardia and hypotension. Continue daily assessment to ascertain eligibility for beta-blocker.
2. If given in the ED, continue daily dose and optimize as dictated by HR and BP.

d. ACE Inhibitor

1. Start ACE inhibitor orally in patients with anterior infarction, pulmonary congestion, or LVEF less than 0.40 if the following are absent: hypotension (SBP less than 100 mm Hg or less than 30 mm Hg below baseline) or known contraindications to this class of medications.

e. Angiotensin Receptor Blocker

1. Start ARB orally in patients who are intolerant of ACE

Table 4. Contraindications and Cautions for Fibrinolysis in STEMI*

Absolute Contraindications	Any prior intracranial hemorrhage Known structural cerebral vascular lesion (e.g., arteriovenous malformation) Known malignant intracranial neoplasm (primary or metastatic) Ischemic stroke within 3 months EXCEPT acute ischemic stroke within 3 hours Suspected aortic dissection Active bleeding or bleeding diathesis (excluding menses) Significant closed-head or facial trauma within 3 months
Relative Contraindications	History of chronic, severe, poorly controlled hypertension Severe uncontrolled hypertension on presentation (SBP greaterthan 180 mm Hg or DBP greater than 110 mm Hg)† History of prior ischemic stroke greater than 3 months, dementia, or known intracranial pathology not covered in contraindications Traumatic or prolonged (greater than 10 minutes) CPR or major surgery (less than 3 weeks) Recent (within 2 to 4 weeks) internal bleeding Noncompressible vascular punctures For streptokinase/anistreplase: prior exposure (more than 5 days ago) or prior allergic reaction to these agents Pregnancy Active peptic ulcer Current use of anticoagulants: the higher the INR, the higher the risk of bleeding

STEMI = ST-elevation myocardial infarction;
SBP = systolic blood pressure; DBP = diastolic blood pressure;
INR = international normalized ratio.
* Viewed as advisory for clinical decision making and may not be all-inclusive or definitive.
† Could be an absolute contraindication in low-risk patients with STEMI

Table 5. Laboratory Evaluations for Management of STEMI

Serum biomarkers for cardiac damage

(do not wait for results before implementing reperfusion strategy)

CBC with platelet count
INR
APTT
BUN
Creatinine
Glucose
Serum lipids

inhibitors and who have either clinical or radiological signs of heart failure or LVEF less than 0.40.

f. Pain Medications

1. IV morphine sulfate 2 to 4 mg with increments of 2 to 8 mg IV at 5- to 15-minute intervals as needed to control pain.

g. Anxiolytics (based on a nursing assessment)

h. Daily Stool Softener

9. Laboratory Tests

Manangement of some complications of acute MI (Fig-2 & 3)

Secondary Prevention and long term Management

Smoking

Goal: Complete cessation

Assess tobacco use. Strongly encourage patient and family to stop smoking and to avoid secondhand smoke. Provide counseling, pharmacological therapy (including nicotine replacement and bupropion), and formal smoking cessation programs as appropriate.

Blood pressure control

Goal : Less than 140/90 mm Hg or less than 130/80 mm Hg if chronic kidney disease or diabetes

If blood pressure is 120/80 mm Hg or greater:

- Initiate lifestyle modification in all patients.

If blood pressure is 140/90 mm Hg or greater or 130/80 mm Hg or greater for individuals with chronic kidney disease or diabetes:

- Add blood pressure reducing medications, emphasizing the use of beta-blockers and inhibitors of the renin-angiotensinaldosterone system.

Lipid management (TG less than 200 mg/dL)

Primary goal: LDL-C substantially less than 100 mg/dL

Start dietary therapy in all patients (less than 7% of total calories as saturated fat and less than 200 mg/d cholesterol).Promote physical activity and weight management. Encourage increased consumption of omega-3 fatty acids.

Assess fasting lipid profile in all patients, preferably within 24 hours of STEMI. Add drug therapy according to the following guide: LDL-C less than 100 mg/dL (baseline or on treatment):

- Statins should be used to lower LDL-C. LDL-C greater than or equal to 100 mg/dL (baseline or on treatment):

Fig: 2 Clinical Signs: shock, hypoperfusion, congestive heart failure, acute pulmonary edema Most likely major underlying disturbance?

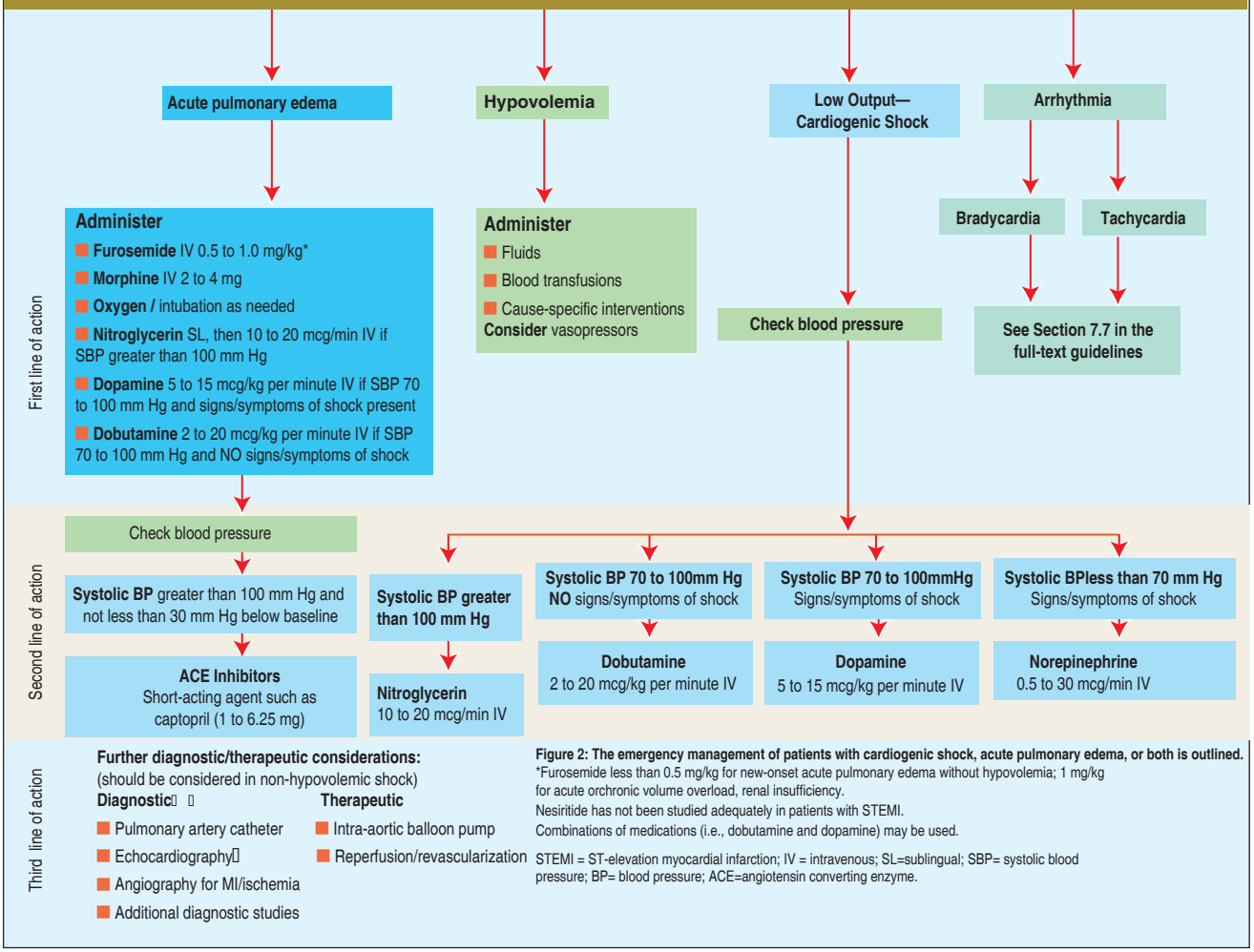


Figure 2: The emergency management of patients with cardiogenic shock, acute pulmonary edema, or both is outlined.
*Furosemide less than 0.5 mg/kg for new-onset acute pulmonary edema without hypovolemia; 1 mg/kg for acute orchronic volume overload, renal insufficiency.
Nesiritide has not been studied adequately in patients with STEMI.
Combinations of medications (i.e., dobutamine and dopamine) may be used.

STEMI = ST-elevation myocardial infarction; IV = intravenous; SL=sublingual; SBP= systolic blood pressure; BP= blood pressure; ACE=angiotensin converting enzyme.

- Intensify LDL-C–lowering therapy with drug treatment, giving preference to statins.

Lipid management (TG 200 mg/dL or greater)
Primary goal: Non–HDL-C substantially less than 130 mg/dL

If TGs are greater than or equal to 150 mg/dL or HDL-C is less than 40 mg/dL:
- Emphasize weight management and physical activity.
  Advise smoking cessation.

If TG is 200–499 mg/dL:
- After LDL-C–lowering therapy, consider adding fibrate or niacin.

If TG is greater than or equal to 500 mg/dL:
- Consider fibrate or niacin before LDL-C–lowering therapy.
- Consider omega-3 fatty acids as adjunct for high TG.

Physical activity

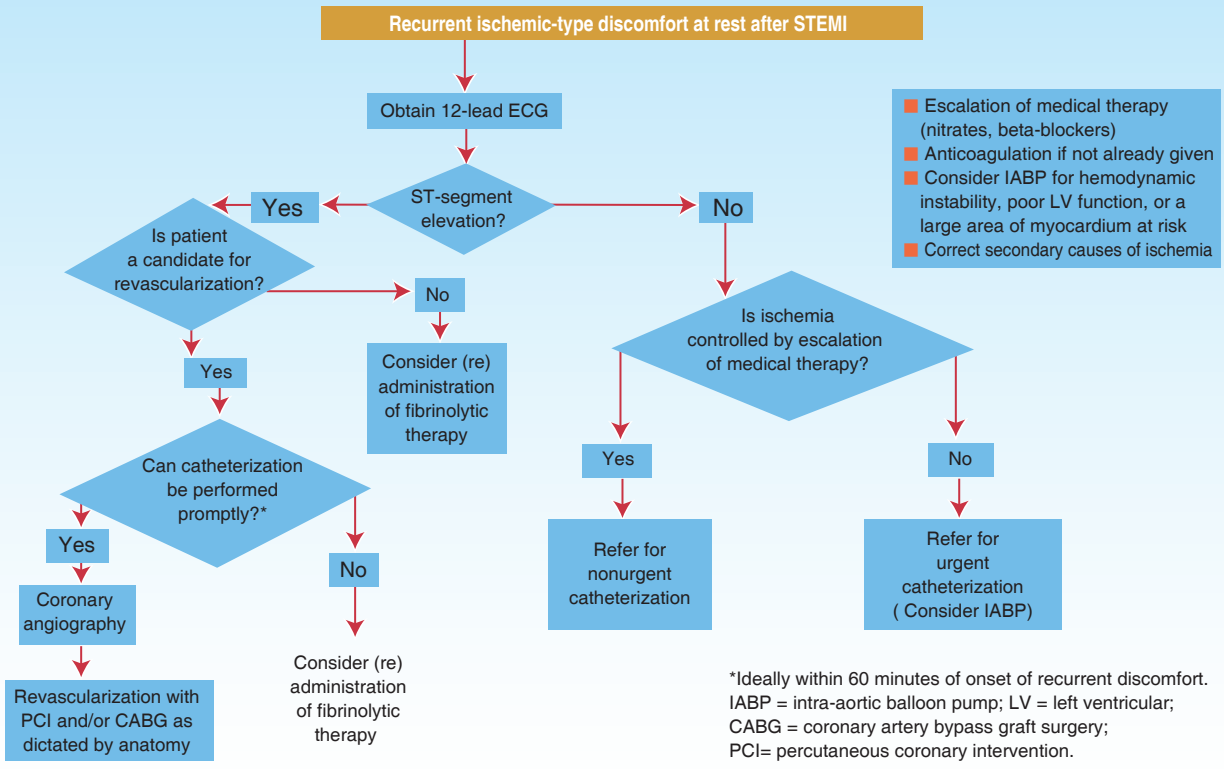
Minimum goal: 30 minutes 3 to 4 days per week; Optimal daily
Assess risk, preferably with exercise test, to guide prescription. Encourage minimum of 30 to 60 minutes of activity, preferably daily but at least 3 or 4 times weekly (walking, jogging, cycling, or other aerobic activity) supplemented by an increase in daily lifestyle activities (eg, walking breaks at work, gardening,household work). Cardiac rehabilitation programs, when available, are recommended for patients with STEMI, particularly those with multiple modifiable risk factors and/or those moderate- to high-risk patients in whom supervised exercise training is warranted.

Weight management
Goal:BMI 18.5-24.9 kg/m2
Waist circumference:
Women: less than 35 inches
Men: less than 40 inches
Calculate BMI and measure waist circumference as part of evaluation.
Monitor response of BMI and waist circumference to therapy.
Start weight management and physical activity as appropriate.
Desirable BMI range is 18.5–24.9 kg/m2.
If waist circumference is greater than or equal to 35 inches in women or greater than or equal to 40 inches in men, initiate lifestyle changes and treatment strategies for metabolic syndrome.

Diabetes management
Goal: HbA1c less than 7%
Appropriate hypoglycemic therapy to achieve near-normal fasting plasma glucose, as indicated by HbA1c.
Treatment of other risk factors (e.g., physical activity, weight management,
blood pressure, and cholesterol management).

Antiplatelet agents / anticoagulants
Start and continue indefinitely aspirin 75 to 162 mg/d if not contraindicated. Consider clopidogrel 75 mg/d or warfarin if aspirin is contraindicated. Manage warfarin to INR 2.5 to 3.5 in post-STEMI patients when clinically indicated or for those not able to take aspirin or clopidogrel.

Figure 3. Algorithm for Management of Recurrent Ischemia/Infarction After STEMI



Need for catheterization and revascularization after STMI (Fig-4)

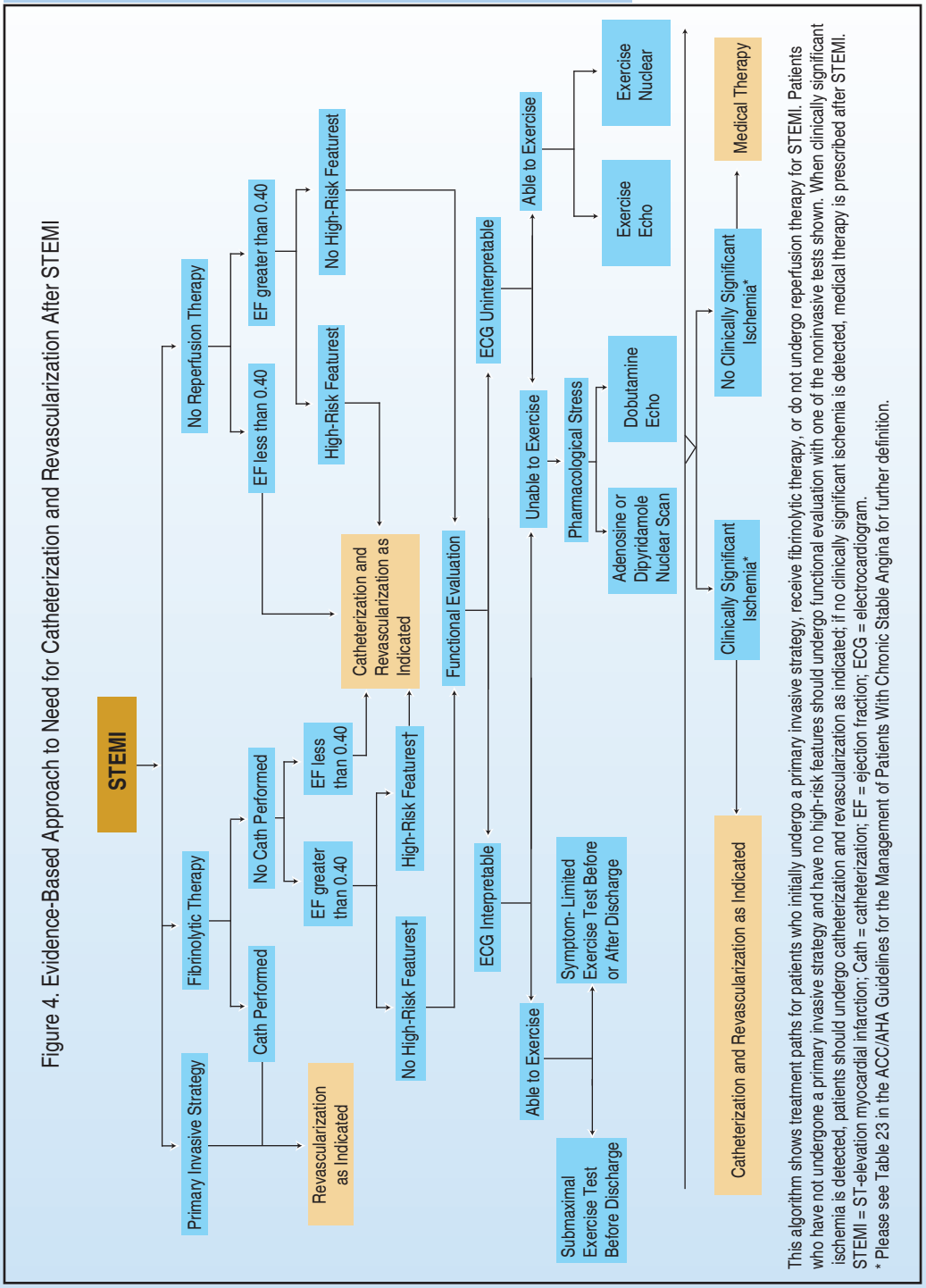


Figure 4. Evidence-Based Approach to Need for Catheterization and Revascularization After STEMI

This algorithm shows treatment paths for patients who initially undergo a primary invasive strategy, receive fibrinolytic therapy, or do not undergo reperfusion therapy for STEMI. Patients who have not undergone a primary invasive strategy and have no high-risk features should undergo functional evaluation with one of the noninvasive tests shown. When clinically significant ischemia is detected, patients should undergo catheterization and revascularization as indicated; if no clinically significant ischemia is detected, medical therapy is prescribed after STEMI.
STEMI = ST-elevation myocardial infarction; Cath = catheterization; EF = ejection fraction; ECG = electrocardiogram.
* Please see Table 23 in the ACC/AHA Guidelines for the Management of Patients With Chronic Stable Angina for further definition.

References :
1. ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction, 2004
2. Management of acute myocardial infarction in patients presenting with ST-Segment elevation, ESC Guideline 2003
3. Acute coronory syndrome data standard by ACC
4. ACC / ESC defination of myocardial infarction

Insight HEART
Vol: 1 No: 3 ; 2005

MI News

No Survival Advantage to Rescue PCI Over Medical Management After MI

In patients with failed fibrinolysis complicating ST-segment elevation MI (STEMI), a strategy of rescue percutaneous coronary intervention (rPCI) does not improve survival compared with a strategy of conservative medical treatment. Any advantage in the rPCI arm observed at 1 year is almost exclusively due to a lower requirement for further revascularization compared with the medically treated groups.This advantage is gained at the expense of more strokes and a greater requirement for blood transfusion in the initial phase. A routine policy of rPCI is therefore not supported as long as patients managed conservatively are treated aggressively for post-infarction angina or reinfarction. The researchers also observed a "strong trend" toward fewer strokes in the conservative treatment compared with the rPCI .

Source: Heart 2005;91:1330-1337.

Socioeconomic Factors Tied to MI Outcome

White men do better after acute MI. Socioeconomic factors and comorbidities - rather than biological differences or preferential treatment is the reason. African-American male & female and Asian females had a 40% increased risk of having a second heart attack compared to white men. About half of the increased risk was due to socioeconomic factors such as income, education, marital status and occupation. The other half was due to chronic conditions such as diabetes, lung disease, depression and to differences in medications and surgical procedures. Eliminating differences in socioeconomic status and treat everyone equally, there will be no more gender and ethnic disparities after suffering a heart attack.

Source: Arch Intern Med 2005;165:2105-2113.

Statins Within 24 Hours of Acute MI May Halve Early Mortality

The use of statin therapy within the first 24 hours of hospitalization for AMI is associated with a significantly lower rate of early complications and in-hospital mortality. Potential mechanisms of early benefit in AMI with statins include decreases in inflammatory cell accumulation in the ischemic myocardium, oxidative stress, and monocyte adhesion. Early use of a statin was also associated with lower risks of cardiogenic shock, arrhythmias, cardiac arrest, and rupture, but not of recurrent myocardial infarction. As statins are already routinely started in myocardial infarction patients prior to hospital discharge, it would be relatively easy to administer this medication on arrival to the emergency department.

Source: Am J Cardiol. 2005;96:611-616

Impaired Kidney Function No Reason to Delay Thrombolytic for Acute MI

Patients with kidney disease experience significant, unnecessary delays in being given thrombolytic therapy for acute myocardial infarction. Patients with kidney disease are not more likely to experience adverse bleeding events associated with thrombolytic therapy and support existing guideline recommendations for expedient thrombolytic treatment for patients with kidney disease with acute MI. The reasons for the delayed receipt of thrombolytic treatment are unknown. However, may be that physicians are concerned about the risk of bleeding complications among patients with kidney disease.

Source: Am J Kidney Dis 2005;46:595-602.

Editorial Note

Dear Doctor
We are happy to present the 3rd issue of *"Insight Heart"*. It is a small endeavor to provide you compiled & updated information on cardiovascular diseases and its management. This issue is focused on *"Acute Myocardial Infraction"*. We will appreciate your thoughtful comments on the Newsletter to enrich the publication.
Thanks and regards.