

ACC/AHA
Pocket
Guidelines



The Management of Patients With Acute Myocardial Infarction

(A Report of the American College
of Cardiology/American Heart Association
Task Force on Practice Guidelines)

April, 2000



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lished in *JACC* and *Circulation*, visit our Web sites at
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I. Introduction

This pocket guideline is a distillation of the publication *ACC/AHA Guidelines for the Management of Patients with Acute Myocardial Infarction*. The guidelines were initially published in the *Journal of the American College of Cardiology* in 1996 (J Am Coll Cardiol 1996; 28:1328-428) and updated in September 1999. The revised text and recommendations are published in the J Am Coll Cardiol 1999;34:890-911 and *Circulation* 1999;100:1016-1030 (recommendations only).

The full text guidelines incorporating the updates and revisions are available on the Web sites of both the ACC (<http://www.acc.org>) and the AHA (<http://www.americanheart.org>) with deleted text indicated by strikeouts and new text presented in highlighted typeface.

This pocket guideline provides rapid prompts for appropriate patient management that is outlined in much greater detail in the full-text guidelines. It is not intended as a replacement for understanding the caveats and rationales carefully stated in the full-text guidelines. Users should consult the full-text document for more information.

The classification of indications for a diagnostic procedure or a specific therapy is expressed in the standard ACC/AHA format:

-
- | | |
|---------|---|
| Class I | Conditions for which there is evidence and/or general agreement that a given procedure or treatment is beneficial, useful, and effective. |
|---------|---|
-
- | | |
|----------|---|
| Class II | Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.

Class IIa Weight of evidence/opinion is in favor of usefulness/efficacy.

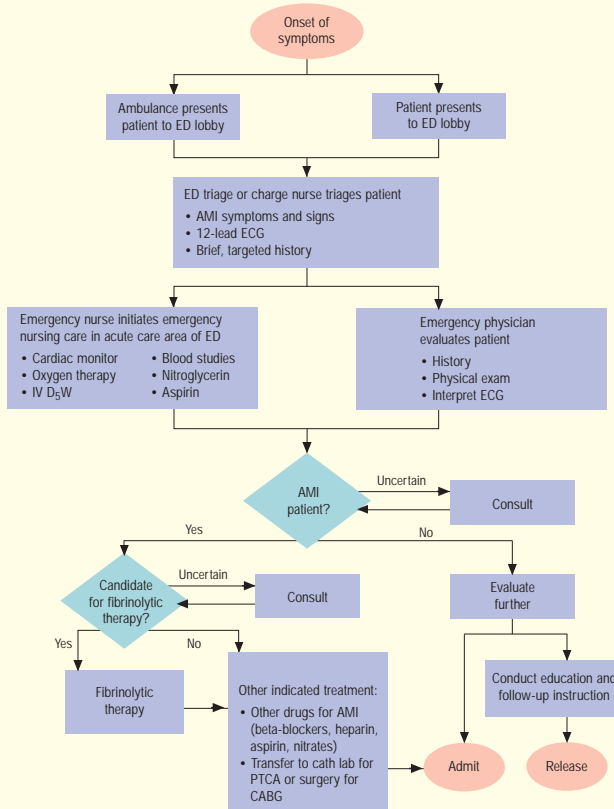
Class IIb Usefulness/efficacy is less well established by evidence/opinion. |
|----------|---|
-
- | | |
|-----------|--|
| Class III | Conditions for which there is evidence and/or general agreement that a procedure/treatment is not useful/effective and in some cases may be harmful. |
|-----------|--|
-

II. Initial Assessment and Evaluation

Emergency Department (ED) Algorithm/Protocol for Patients with Symptoms and Signs of AMI



Differential Diagnosis of Prolonged Chest Pain



AMI

Aortic dissection

Pericarditis

Atypical anginal pain associated with hypertrophic cardiomyopathy

Esophageal, other upper gastrointestinal, or biliary tract disease

Pulmonary disease

Pneumothorax

Embolus with or without infarction

Pleurisy: infectious, malignant, or immune disease-related

Hyperventilation syndrome

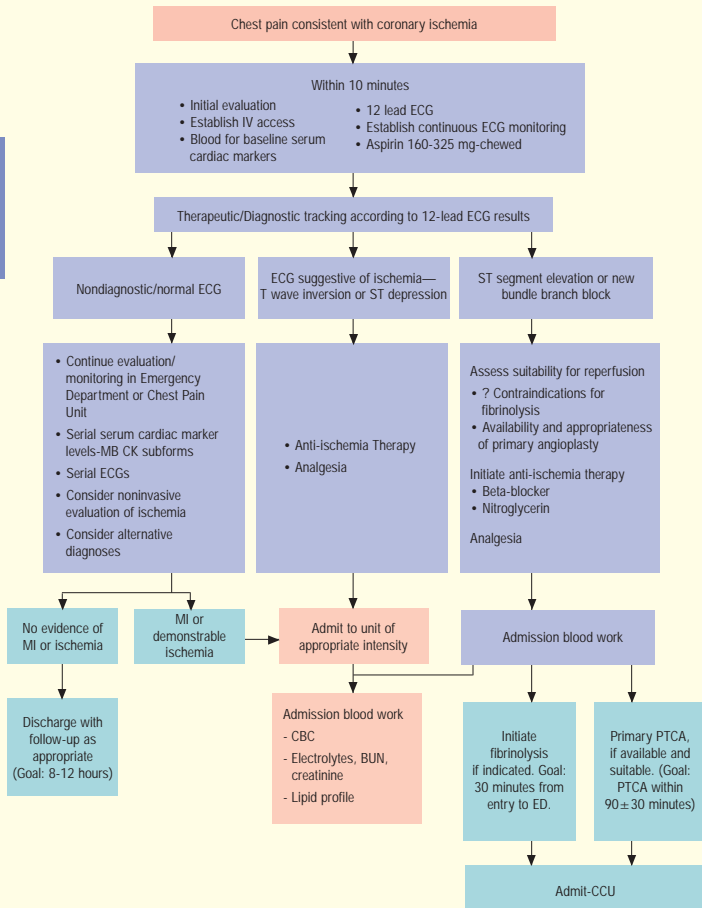
Chest wall

Skeletal

Neuropathic

Psychogenic

Algorithm for Initial Assessment and Evaluation of the Patient with Acute Chest Pain



Algorithm for Initial Assessment and Evaluation of the Patient with Acute Chest Pain in the Emergency Department

The emergency department should be organized to facilitate the rapid triage of chest pain patients so that the initial evaluation, obtaining a 12-lead electrocardiogram (ECG), and establishing intravenous access and continuous monitoring are accomplished within 10 minutes. The path in the decision tree is determined by the results of the 12-lead ECG. The presence of ST-segment elevation diagnostic of AMI or of presumptively new bundle branch block (BBB) suggestive of this diagnosis should lead to the immediate consideration of the suitability of the patient for reperfusion therapy, which, if indicated, should be initiated within 30 minutes of the patient's arrival. The primary PTCA option is applicable only in those settings in which it is immediately available and can be performed by highly qualified interventional cardiologists. In general, patients should not be transferred for angioplasty if fibrinolysis is an option. Fibrinolysis is not indicated in patients with only ST-segmented depression.

Chest Pain Checklist

for Use by EMT/Paramedic for Diagnosis of Acute Myocardial Infarction and Fibrinolytic Therapy Screening

Check each finding below. If all [yes] boxes are checked and ECG indicates ST elevation or new BBB, reperfusion therapy with fibrinolysis or primary PTCA may be indicated. Fibrinolysis is generally not indicated unless all [no] boxes are checked and BP \leq 180/110 mm Hg.

	Yes	No
Ongoing chest discomfort (\geq 20 minutes and < 12 hrs)	<input type="checkbox"/>	-
Oriented, can cooperate	<input type="checkbox"/>	-
Age > 35 y (> 40 if female)	<input type="checkbox"/>	-
History of stroke or TIA	-	<input type="checkbox"/>
Known bleeding disorder	-	<input type="checkbox"/>
Active internal bleeding in past 2 weeks	-	<input type="checkbox"/>
Surgery or trauma in past 2 weeks	-	<input type="checkbox"/>
Terminal illness	-	<input type="checkbox"/>
Jaundice, hepatitis, kidney failure	-	<input type="checkbox"/>
Use of anticoagulants	-	<input type="checkbox"/>
Systolic/diastolic blood pressure	Right arm ___/___	Left arm ___/___
ECG done	<input type="checkbox"/>	-
<i>High-risk profile*</i>	Yes	No
Heart rate \geq 100 bpm	<input type="checkbox"/>	-
BP \leq 100 mm Hg	<input type="checkbox"/>	-
Pulmonary edema (rales greater than one half-way up)	<input type="checkbox"/>	-
Shock	<input type="checkbox"/>	-
*Transport to hospital capable of angiography and revascularization if needed.		
1. Pain began _____ AM/PM	3. Begin transport _____ AM/PM	
2. Arrival time _____ AM/PM	4. Hospital arrival _____ AM/PM	

EMT indicates emergency medical technician; ECG, electrocardiogram; BBB, bundle branch block; PTCA, percutaneous transluminal coronary angioplasty; BP blood pressure; TIA, transient ischemic attack. Adapted from the Seattle/King County EMS Medical Record.

Serum Cardiac Markers

- CK-MB subforms for Dx within 6 hrs of MI onset
- cTnI and cTnT efficient for late Dx of MI
- CK-MB subform plus cardiac-specific troponin best combination
- Do not rely solely on troponins because they remain elevated for 7-14 days and compromise ability to diagnose recurrent infarction

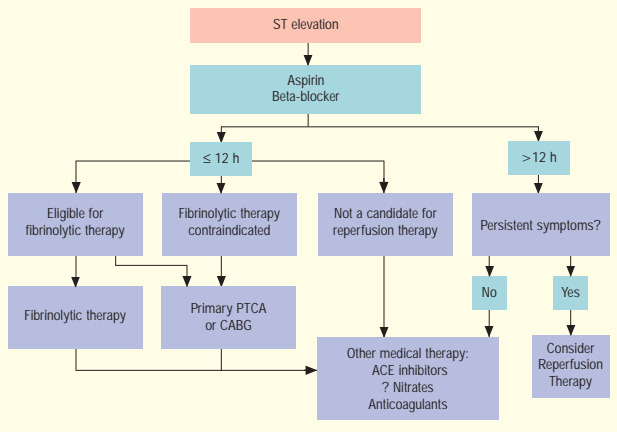
Enzymatic Criteria for Diagnosis of Myocardial Infarction*

- Serial increase, then decrease of plasma CK-MB, with a change > 25% between any two values
- CK-MB > 10-13 U/L or > 5% total CK activity
- Increase in MB-CK activity > 50% between any two samples, separated by at least 4 hrs
- If only a single sample available, CK-MB elevation > twofold
- Beyond 72 hrs, an elevation of troponin T or I or LDH-1 > LDH-2

*Adapted from Alexander RW, Pratt CM, Roberts R. *Diagnosis and Management of Patients with Acute Myocardial Infarction* In: Alexander RW, Schlant RC, Fuster V, eds. *Hurst's The Heart* 1998, New York, NY: McGraw-Hill

III. Initial Management

Recommendations for the Management of Patients with ST Elevation



All patients with ST-segment elevation on the electrocardiogram should receive aspirin (ASA). Beta-adrenoreceptor blockers (in the absence of contraindications), and an antithrombin (particularly if alteplase/reteplase is used for fibrinolytic therapy). Whether heparin is required in patients receiving nonselective fibrinolytic agents remains a matter of controversy; the small additional risk for intracranial hemorrhage may not be offset by the survival benefit afforded by adding heparin to SK therapy. Patients treated within 12 hours who are eligible for fibrinolytics should expeditiously receive either fibrinolytic therapy or be considered for primary percutaneous transluminal coronary angioplasty (PTCA). Primary PTCA is also to be considered when fibrinolytic therapy is absolutely contraindicated. Coronary artery bypass graft (CABG) may be considered if the patient is less than 6 hours from onset of symptoms. Individuals treated after 12 hours should receive the initial medical therapy noted above and, on an individual basis, may be candidates for reperfusion therapy or angiotensin-converting enzyme (ACE) inhibitors (particularly if left ventricular function is impaired). Modified from Antman EM. Medical therapy for acute coronary syndromes: an overview. In: Califf RM, ed. Atlas of Heart Diseases, VIII. Philadelphia, Pa: Current Medicine: 1996.

Comparison of Approved Fibrinolytic Agents

	Streptokinase	Anistreplase	Alteplase	Reteplase
Dose	1.5 MU in 30-60 min	30 mg in 5 min	100 mg in 90 min	10 U x 2 over 30 min
Bolus administration	No	Yes	No	Yes
Antigenic	Yes	Yes	No	No
Allergic reactions (hypotension most common)	Yes	Yes	No	No
Systemic fibrinogen depletion	Marked	Marked	Mild	Moderate
90-min. patency rates(%)	~ 50	~ 65	~ 75	~ 75
TIMI grade 3 flow (%)	32	43	54	60
Mortality rate in most recent comparative trials (%)	7.3	10.5	7.2	7.5
Cost per dose (US)	\$294	\$2116	\$2196	\$2196

TIMI flow indicates Thrombolysis in Myocardial Infarction study flow rate.

Contraindications and Cautions for Fibrinolytic Use in Myocardial Infarction*

Absolute Contraindications

- Previous hemorrhagic stroke at any time: other strokes or cerebrovascular events within 1 yr
- Known intracranial neoplasm
- Active internal bleeding (does not include menses)
- Suspected aortic dissection

Cautions/Relative Contraindications

- Severe uncontrolled hypertension on presentation (blood pressure > 180/110 mm Hg)[†]
- History of prior cerebrovascular accident or known intracerebral pathology not covered in contraindications
- Current use of anticoagulants in therapeutic doses (INR ≥ 2-3); known bleeding diathesis
- Recent trauma (within 2-4 wks), including head trauma
- Noncompressible vascular punctures
- Recent (within 2-4 wks) internal bleeding
- For streptokinase/anistreplase: prior exposure (especially within 5d-2y) or prior allergic reaction
- Pregnancy
- Active peptic ulcer
- History of chronic hypertension

INR indicates 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 myocardial infarction.

Primary Percutaneous Transluminal Coronary Angioplasty Recommendations



Class I Recommendations

1. As an alternative to fibrinolytic therapy if:
 - ST-segment elevation or new or presumed new LBBB
 - Within 12 hrs of symptoms or > 12 hrs of persistent pain
 - In a timely fashion (90± 30 min)
 - By experienced operators
 - In appropriate laboratory environment
2. In cardiogenic shock patients <75 yrs who are within 36 hrs of AMI and revascularization can be performed within 18 hrs of onset of shock

Class IIa Recommendations

1. As a reperfusion strategy in candidates for reperfusion who have a contraindication to fibrinolytic therapy.

Class IIb Recommendations



1. In patients with AMI who do not present with ST elevation but who have reduced [less than TIMI (Thrombolysis in Myocardial Infarction) grade 2] flow of the infarct-related artery and when angioplasty can be performed within 12 hrs of onset of symptoms.

Class III Recommendations

1. This classification applies to patients with AMI who

- Undergo elective angioplasty in a noninfarct-related artery at the time of AMI
- Are beyond 12 hrs after the onset of symptoms and have no evidence of myocardial ischemia
- Have received fibrinolytic therapy and have no symptoms of myocardial ischemia
- Are fibrinolytic-eligible and are undergoing primary angioplasty by an unskilled operator in a laboratory that does not have surgical capability.



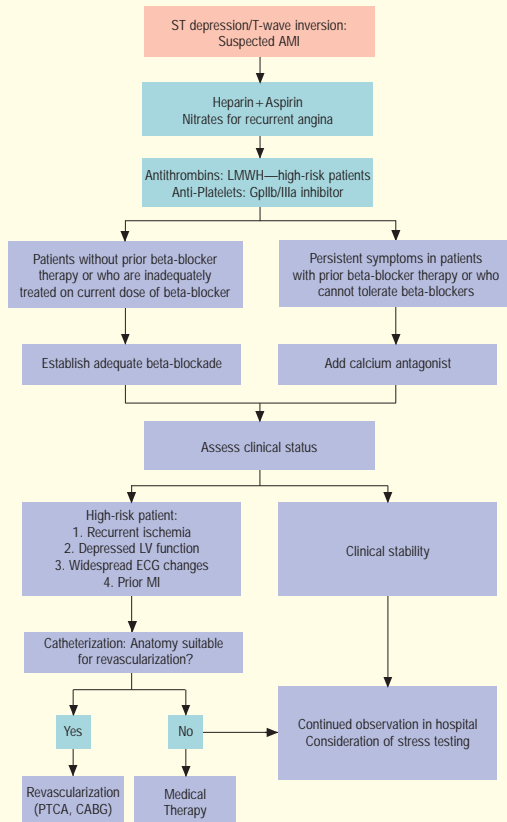
Advantages of Fibrinolytic Therapy

- More universal access
- Shorter time to treatment
- Greater clinical trial evidence of:
 - reduction in infarct size
 - improvement of LV function
- Results less dependent on physician experience
- Lower system cost

Advantages of Primary PTCA

- Higher initial reperfusion rates
- Lower recurrence rates of ischemia/infarction
- Less residual stenosis
- Less intracranial bleeding
- Defines coronary anatomy and LV function
- Utility when fibrinolysis contraindicated

Recommendations for the Management of Patients with Non-ST Elevation MI



Algorithm for the Management of Patients with Non-ST Elevation MI

All patients without ST elevation should be treated with an antithrombin and aspirin (ASA). Nitrates should be administered for recurrent episodes of angina. Adequate beta-adrenoceptor blockade should then be established; when this is not possible or contraindications exist, a calcium antagonist can be considered. Current data indicate that either an invasive or non-invasive treatment strategy is suitable for non-ST-elevation AMI patients. AMI indicates acute myocardial infarction; CABG, coronary artery bypass graft; ECG, electrocardiographic; GpIIb/GpIIIa, Glycoprotein IIb/IIIa receptor for platelet aggregation; LMWH, low molecular weight heparin; LV, left ventricular; PTCA, percutaneous transluminal coronary angioplasty.

Modified from Antman EM. Medical therapy for acute coronary syndromes: an overview. In Calif RM, editor. Atlas of Heart Diseases, VIII. Philadelphia, PA: Current Medicine; 1996.

Pharmacologic Management of Patients with MI

Heparin Recommendations

Class I Recommendations

1. In patients undergoing percutaneous or surgical revascularization.

Class IIa Recommendations

1. Intravenously in patients undergoing reperfusion therapy with alteplase/reteplase. See table below for dosing:

Change in Heparin (Unfractionated) Dose with alteplase/reteplase

	1999 Recommendations	1996 Recommendations
Bolus Dose	60 U/kg	70 U/kg
Maintenance	≈12 U/kg/hr	≈15 U/kg/hr
Maximum	4000 U bolus 1000 U/h if > 70 kg	None
aPTT	1.5-2.0 x control (50-70 sec) for 48 hrs	1.5-2.0 x control (50-70sec) for 48 hrs

2. Intravenous unfractionated heparin (UFH) or low molecular weight heparin (LMWH) subcutaneously for patients with non-ST elevation MI.

3. Subcutaneous UFH (eg, 7,500 U b.i.d.) or low molecular weight heparin (eg, enoxaparin 1 mg/kg b.i.d.) in all patients not treated with fibrinolytic therapy who do not have a contraindication to heparin. In patients who are at high risk for

systemic emboli (large or anterior MI, AF, previous embolus, or known LV thrombus), intravenous heparin is preferred.

4. Intravenously in patients treated with nonselective fibrinolytic agents (streptokinase, anistreplase, urokinase) who are at high risk for systemic emboli (large or anterior MI, AF, previous embolus, or known LV thrombus).

Class IIb Recommendations

1. In patients treated with nonselective fibrinolytic agents, not at high risk, subcutaneous heparin, 7,500 U to 12,500 U twice a day until completely ambulatory.

Class III Recommendations

1. Routine intravenous heparin within 6 hrs to patients receiving a nonselective fibrinolytic agent (anistreplase, streptokinase, urokinase) who are not at high risk for systemic embolism.

GP IIb/IIIa Inhibitors—New Recommendations

Class IIa Recommendations

■ For use in patients experiencing an MI without ST segment elevation who have some high-risk features and/or refractory ischemia, provided they do not have a contraindication due to a bleeding risk.

A Classification of Inotropic Agents



Agent	Mechanism	Inotropic	Vascular Effect	Major Use
Isoproterenol	β -1 receptor	++	Dilatation	Hypotension due to bradycardia; no pacing available
Dobutamine	β -1 receptor	++	Mild dilatation	Low output with SBP > 90 mm Hg
Dopamine	Low dose: dopaminergic receptor	++	Renovascular dilatation	Hypoperfusion with SBP < 90 mm Hg or \geq 30 mm Hg below usual value
	Medium dose: β -1 receptor		Constriction	
	High dose: α -receptor		Intense constriction	
Norepinephrine	α -receptor	++	Intense constriction	Extreme hypotension despite dopamine use
Amrinone	Phosphodiesterase inhibitor	++	Dilatation	Second-tier agent after failure of dopamine/dobutamine
Milrinone	Phosphodiesterase inhibitor	++	Dilatation	
Digitalis	Inhibits $Na^+ - K^+$ ATPase pump	+	Variable	Established systolic LV dysfunction and symptoms of heart failure for chronic therapy

SBP indicates systolic blood pressure; LV, left ventricular

V. Hospital Management

Sample Admitting Orders

Condition	Serious
IV	NS or D ₅ W to keep vein open
Vital signs	q 1/2 hr until stable, then q 4 hrs and p.r.n. Notify if HR < 60 or > 110; BP < 90 or > 150; RR < 8 or > 22. Pulse oximetry x 24 hrs.
Activity	Bed rest with bedside commode and progress as tolerated after approximately 12 hrs.
Diet	NPO until pain free, then clear liquids. Progress to a heart-healthy diet (complex carbohydrates= 50-55% of kilocalories, monounsaturated and unsaturated fats (≤ 30% of kilocalories), including foods high in potassium (eg, fruits, vegetables, whole grains, dairy products), magnesium (eg, green leafy vegetables, whole grains, beans, seafood), and fiber (eg, fresh fruits and vegetables, whole-grain breads, cereals).
Medications	Nasal O ₂ 2 L/min x 3 hrs Enteric-coated aspirin daily (165 mg) Stool softener daily Beta-adrenoceptor blockers? Consider need for analgesics, nitroglycerin, anxiolytics

Treatment Strategy for Right Ventricular Ischemia/Infarction

Maintain right ventricular preload

- Volume loading (IV normal saline)
- Avoid use of nitrates and diuretics
- Maintain AV synchrony
 - AV sequential pacing for symptomatic high-degree heart block unresponsive to atropine
- Prompt cardioversion for hemodynamically significant SVT

Inotropic support

- Dobutamine (if cardiac output fails to increase after volume loading)

Reduce right ventricular afterload with left ventricular dysfunction

- Intra-aortic balloon pump
- Arterial vasodilators (sodium nitroprusside, hydralazine)
- ACE inhibitors

Reperfusion

- Fibrinolytic agents
- Primary PTCA
- CABG (in selected patients with multivessel disease)

Note: IV indicates intravenous; AV, atrioventricular; SVT, supraventricular tachycardia; ACE, angiotensin converting enzyme; PTCA, percutaneous transluminal coronary angioplasty; CABG, coronary artery bypass graft.

Clinical Profile of Mechanical Complications of Myocardial Infarction

Variable	Ventricular Septal Defect	Free Wall Rupture	Papillary Muscle Rupture
Age (mean, years)	63	69	65
Days post MI	3-5	3-6	3-5
Anterior MI	66%	50%	25%
New murmur	90%	25%	50%
Palpable thrill	Yes	No	Rare
Previous MI	25%	25%	30%
Echo findings:			
Two-dimensional Doppler	Visualize defect Detect shunt	May have pericardial effusion	Flail or prolapsing leaflet Regurgitating jet in LA
PA catheterization	Oxygen step up Hi RV	Equalization of diastolic pressure	Prominent V wave in PCW tracing
Mortality			
Medical	90%	90%	90%
Surgical	50%	Case Reports	40-90%

MI indicates myocardial infarction; VSD, ventricular septal defect; LA, left atrium; PA, pulmonary artery; RV, right ventricle; PCW, pulmonary capillary wedge. Modified from Labovitz AJ, et al. Mechanical complications of acute myocardial infarction. *Cardiovasc Rev Rep.* 1984;5-948.



IV. MI Management Summary

Initial Management in ED

- Initial evaluation with ECG in < 10 minutes
- O₂ by nasal prongs, IV access, continual ECG
- Sublingual TNG unless SBP < 90 or HR < 50 or > 100
- Analgesia (MS or meperidine)
- Aspirin (160-325 mg chewed)
- Lipid panel, electrolytes, magnesium, enzymes
- Fibrinolysis or PTCA if ST elevation > 1mV or LBBB (goal: door-needle < 30 minutes or door-dilatation < 90 minutes).

MI Management in 1st 24 hours

- Limited activity for 12 hrs, monitor ≥ 24 hrs
- No prophylactic antiarrhythmics
- IV heparin if: a) large anterior MI; b) PTCA; c) LV thrombus; or d) alteplase/reteplase use (for ~ 48hrs)
- SQ heparin for all other MI (7,500u b.i.d.)
- Aspirin indefinitely
- IV TNG for 24-48 hrs if no ↑/↓HR or ↓BP
- IV beta-blocker if no contraindications
- ACE inhibitor in all MI if no hypotension

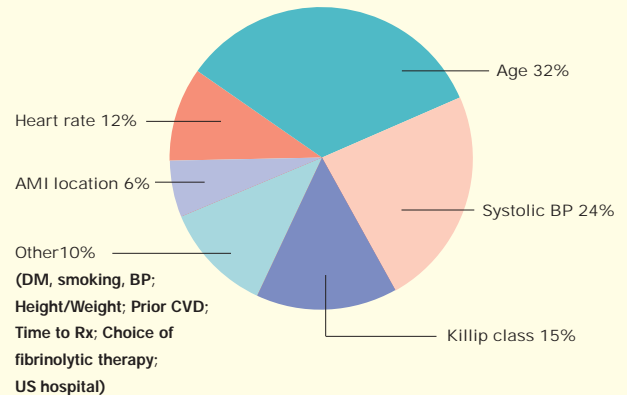


In-Hospital Management

- Aspirin indefinitely
- Beta-blocker indefinitely
- ACE inhibitor (DC at ~ 6 wks if no LV dysfunction)
- If spontaneous or provoked ischemia—elective cath
- Suspected pericarditis—ASA 650 mg q4-6 hrs
- CHF—ACE inhibitor and diuretic as needed
- Shock—consider intra-aortic balloon pump + cath with PTCA or CABG
- RV MI-fluids (NS) + inotropics if hypotensive

Predictors of 30 day Mortality in Fibrinolysis Patients*

Proportion of Risk Associated with Variable

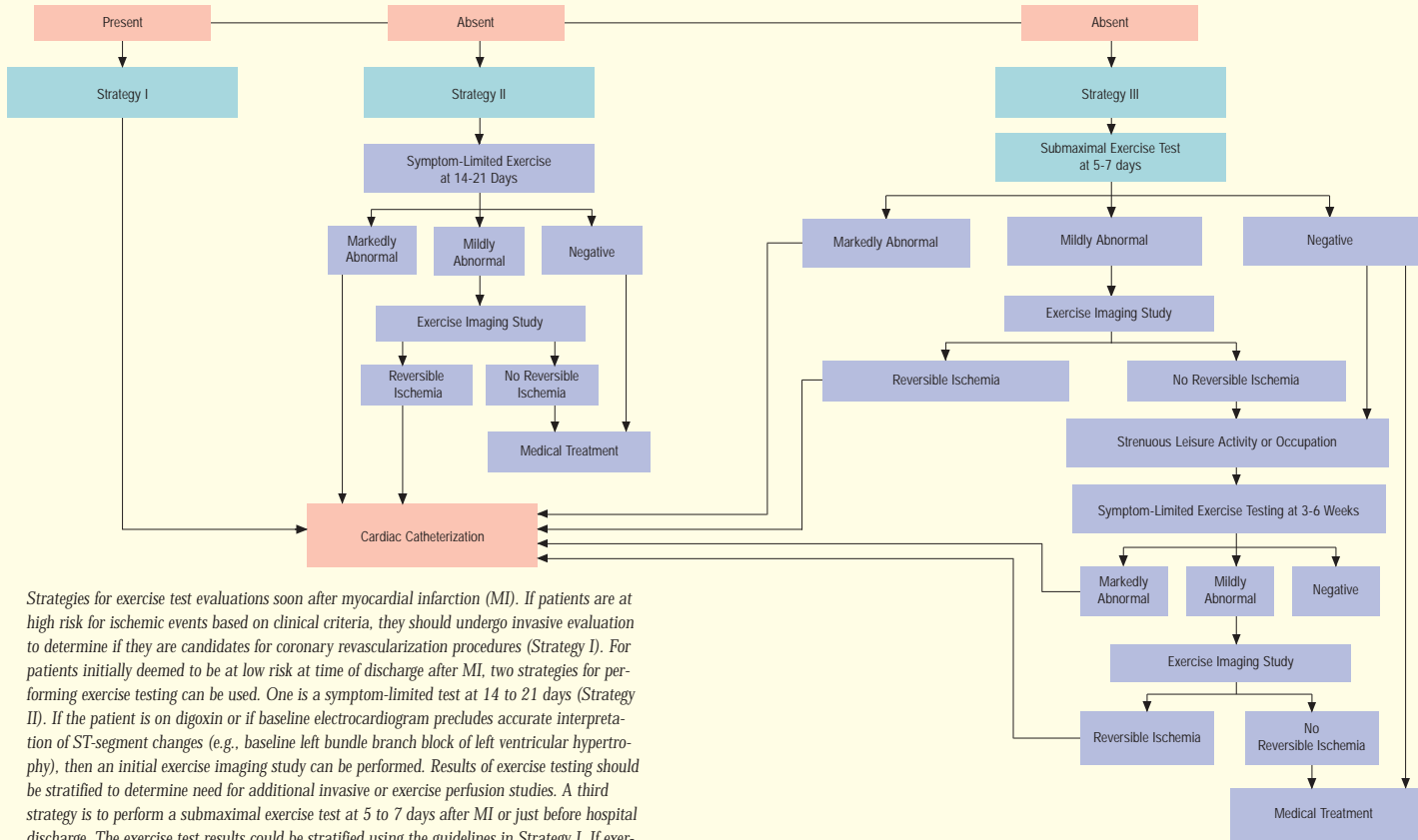


Does not total 100% due to rounding.

*Circulation 91: 1659, 1995

VI. Preparation for Discharge from the Hospital

Clinical Indications of High Risk at Predischarge



Strategies for exercise test evaluations soon after myocardial infarction (MI). If patients are at high risk for ischemic events based on clinical criteria, they should undergo invasive evaluation to determine if they are candidates for coronary revascularization procedures (Strategy I). For patients initially deemed to be at low risk at time of discharge after MI, two strategies for performing exercise testing can be used. One is a symptom-limited test at 14 to 21 days (Strategy II). If the patient is on digoxin or if baseline electrocardiogram precludes accurate interpretation of ST-segment changes (e.g., baseline left bundle branch block of left ventricular hypertrophy), then an initial exercise imaging study can be performed. Results of exercise testing should be stratified to determine need for additional invasive or exercise perfusion studies. A third strategy is to perform a submaximal exercise test at 5 to 7 days after MI or just before hospital discharge. The exercise test results could be stratified using the guidelines in Strategy I. If exercise test studies are negative, a second symptom-limited exercise test could be repeated at 3 to 6 weeks for patients undergoing vigorous activity during leisure or at work.

Energy Levels Required to Perform Some Common Activities

	< 3 METs	3-5 METs	5-7 METs	7-9 METs	> 9 METs
Self-Care	Washing Shaving Dressing Desk work Washing dishes Driving auto Light housekeeping	Cleaning windows Raking Power lawn mowing Bedmaking/stripping Carrying objects (15-30 lb.)	Easy digging in garden Hand lawn mowing (level) Climbing stairs (slowly) Carrying objects (30-60 lb.) Digging vigorously	Sawing wood Heavy shoveling Climbing stairs (moderate speed) Carrying objects (60-90 lb.)	Carrying loads upstairs (objects > 90 lb.) Climbing stairs (quickly) Shoveling heavy snow
Occupational	Sitting (clerical/assembly) Typing Desk work Standing (store clerk)	Stocking shelves (light objects) Auto repair Light welding/carpentry	Carpentry (exterior) Shoveling dirt Sawing wood Operating pneumatic tools	Digging ditches (pick and shovel)	Lumber jack Heavy laborer
Recreational	Golf (cart) Knitting Hand sewing	Dancing (social) Golf (walking) Sailing Tennis (doubles) Volleyball (6 persons)	Badminton (competitive) Tennis (singles) Snow skiing (downhill) Light backpacking Basketball Football Stream fishing	Canoeing Mountain climbing Paddle ball	Handball Squash Ski touring Vigorous basketball
Physical conditioning	Walking (2 mph) Stationary bike Very light calisthenics	Level walking (3-4 mph) Level biking (6-8 mph) Light calisthenics	Level walking (4.5 -5.0 mph) Bicycling (9 -10 mph) Swimming, breast stroke	Level jogging (5 mph) Swimming (crawl stroke) Rowing machine Heavy calisthenics Bicycling (12 mph)	Running (> 6 mph) Bicycling (> 13 mph) Rope jumping Walking uphill (5 mph)

METs indicates metabolic equivalents. Adapted from Table 9.2, p 147. *Rehabilitation of the coronary patient* (Wenger NI, Hellerstein HK, eds), Haskell WL, *Design and Implementation of Cardiac Conditional Program*. New York, NY: Churchill Livingstone: 1978.



Recommendations for Hormone Replacement Therapy (HRT) After Acute MI*

Class IIa Recommendations

1. HRT with estrogen and progestin for secondary prevention of coronary events should not be given de novo to postmenopausal women after AMI.
2. Postmenopausal women who are already taking HRT with estrogen plus progestin at the time of AMI can continue their therapy.

*HERS Study: JAMA 1998;280:605-13

Sample Patient Education Form

Acute Coronary Syndrome:

- Acute Myocardial Infarction (Heart Attack)
- Unstable Angina
- Other

Heart Attack Patients Only:

I understand that I have had a heart attack and that the diagnosis was confirmed by:

- changes in my electrocardiogram (ECG)
- changes in the enzyme levels in my blood

Diagnosis

I understand that I have Coronary Heart Disease and that my diagnosis was confirmed by:

- symptoms
- stress test results
- changes in my ECG
- heart catheterization

Cholesterol TC____ LDL ____ HDL ____ Ejection Fraction____%

Medication I understand there are certain medications which may help to prevent a future attack and may help to extend my life.

- Aspirin: 81 mg qd indefinitely
- Beta-blocker -
- Sublingual nitroglycerin tablets
- ACE Inhibitor -
- Cholesterol lowering -

I understand that I have not received a prescription for one or more of these medications because _____

Smoking I understand that smoking increases my chances of suffering a future heart attack and that smoking causes other illnesses which can shorten my life.

- | | Yes | No |
|--|--------------------------|--------------------------|
| I smoke and have been counseled to stop. | <input type="checkbox"/> | <input type="checkbox"/> |
| I do not smoke. | <input type="checkbox"/> | <input type="checkbox"/> |

continued on next page

Diet

I understand that a diet that is low in cholesterol and fat may help to reduce my chances of suffering a future heart attack and may help to extend my life.

I have received I have not received *counseling about a low fat diet.*

Exercise

Heart Attack Patients Only: I have undergone an exercise test during my hospitalization or I am scheduled to undergo an exercise test to help determine whether I can safely participate in a cardiac rehabilitation program.

I have received I have not received *activity instructions for the next 4-6 weeks, before I start cardiac rehabilitation.*

I have received I have not received a *referral to an outpatient cardiac rehabilitation program.*

Education

I have received I have not received *cardiac education during my hospitalization.*

I know I do not know *warning signs and symptoms of heart attack and action to take if they occur.*

I have received I have not received *instructions on my discharge medications.*

Patient Signature

Date

Nurse Signature

Date

Management of Acute Myocardial Infarction

Date of last revision: September, 1999; AMI

Pharmacological Therapy

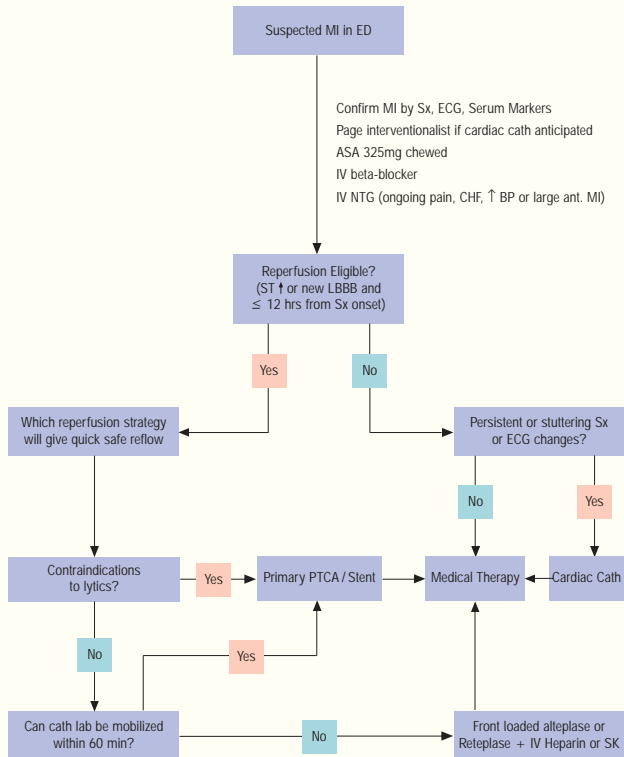
Medication	First 24 Hours	After First 24 Hours	Discharge
Aspirin	Chewed in ED (325mg)	180-325mg qd	81 mg qd indefinitely
Reper for ST [↑] or new LBBB ≤ 12 hrs of symptom onset	Front loaded Rx treatment fibrinolytics* (dosing on back of card) or Primary PTCA	Reperfusion: alteplase/reteplase can be repeated for recurrent occlusion	
Heparin (unfractionated UFH)	IV in alteplase, reteplase, PTCA treated patients and non-ST elevation MI: large or ant. MI, AF, prior embolus, LV thrombus 60 U/kg bolus, infusion 12 U/kg/hr (max 4000 U bolus/ 1000 U/hr infusion for pts > 70kg) to maintain aPTT 50-70 seconds	48 hrs in alteplase, reteplase treated patients: SubQ heparin for all until ambulatory	Coumadin for 3-6 months if LV thrombus seen or thromboembolism; chronically for AF
Low Molecular Weight Heparin (LMWH)	Subcutaneously (SC) 1mg/kg b.i.d. for patients with non-ST elevation MI if no contraindications; all patients not treated with fibrinolytics, if no contraindications (alternative to UFH)		
Beta-Blockers**	IV Metoprolol (up to 15mg in 3 divided doses) or IV Atenolol (10mg in 2 divided doses)	Oral Metoprolol 50-100mg daily or Atenolol 50-100mg qd or other beta-blockers	Oral daily indefinitely
ACE Inhibitors	Initial dose 6.25 mg captopril followed by 12.5 mg 2 hrs later, 25 mg 10-12 hrs later, then 50 mg b.i.d. or lisinopril 5 mg initially, 5 mg after 24 hrs, 10 mg after 48 hrs, then 10 mg daily	Daily for up to 6 wks	Longer if Sx CHF or LVEF ≤ 40%
GPIIb/IIIa	Tirofiban 0.4 ug/kg/min over 30 min, then infuse 0.1 ug/kg/min for non-ST elevated MI patients at high-risk (elevated serum markers, refractory ischemia)		
Nitroglycerin	IV for 24-48 hrs if no contraindications	Only for ongoing ischemia or uncontrolled hypertension	Oral for residual ischemia
Statins			Indefinitely if LDL-C > 100mg/dl
Hormone Replacement Therapy (HRT)		After 1st 24 hrs— should not be given de novo to postmenopausal women after acute MI. Women already taking HRT plus progestin at time of AMI can continue. Counsel all postmenopausal women about potential benefits of HRT.	Offer options of HRT

**Cautions/Relative Contraindications: Heart rate < 60 bpm; PR interval > 0.24 seconds; severe PVD; SAP < 100mm Hg; 2nd or 3rd AV block; IDDM; signs of peripheral hypoperfusion; severe COPD; severe LV failure; Hx of Asthma

Non-Pharmacological Therapy

Therapy	First 24 Hours	After First 24 Hours	Discharge
Dietary Advice		Education on low-fat diet	Recommend low-fat diet
Smoking	Reinforce cessation	Reinforce cessation	Referral to smoking cessation classes if desired
Exercise	Education	Hallway ambulation	Recommend regular aerobic exercise
Pre-discharge ETT	For uncomplicated patient plan on 4-5 days	Perform pre-discharge ETT	Cath patients with significant ischemia
Measure LVEF		ECHO or MUGA prior to d/c if no LV gram	ACE inhibitors if LVEF ≤ 40% or in-hospital CHF
Cardiac Rehabilitation		Start exercise	Refer to rehab program near their home

Patient Management



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The following material was adapted from the ACC/AHA Guidelines for The Management of Patients with Acute Myocardial Infarction: 1999 Update. For a copy of the full report or Executive Summary as published in JACC and Circulation, visit our Web sites at <http://www.acc.org> or <http://www.americanheart.org> or call the ACC Resource Center at 1-800-253-4636, ext.694.

Indications for Cardiac Catheterization

- Primary PTCA
- Rescue for the failed fibrinolysis
- Clinical Conditions
 - Cardiogenic shock/hemorrhagic instability
 - CHF
 - Suspected mechanical complications eg. VSD, ruptured papillary muscle
 - Recurrent symptomatic arrhythmia
- Ischemia on pre-discharge ETT

Contraindications and Cautions for Fibrinolytic Use in Myocardial Infarction

Absolute Contraindications

- Previous hemorrhagic stroke at any time: other strokes or cerebrovascular events within 1 yr
- Known intracranial neoplasm
- Active internal bleeding (does not include menses)
- Suspected aortic dissection

Cautions/Relative Contraindications

- Severe uncontrolled hypertension on presentation (blood pressure >180/110 mm Hg)[†]
- History of prior cerebrovascular accident or known intracerebral pathology not covered in contraindications
- Current use of anticoagulants in therapeutic doses (INR ≥ 2-3); known bleeding diathesis
- Recent trauma (within 2-4 wks), including head trauma
- Noncompressible vascular punctures
- Recent (within 2-4 wks) internal bleeding
- For streptokinase/anistreplase: prior exposure (especially within 5d-2y) or prior allergic reaction
- Pregnancy
- Active peptic ulcer
- History of chronic hypertension

[†] Could be an absolute contraindication in low-risk patients with myocardial infarction.

* Fibrinolytic Dosing (from front of card)

Alteplase, 15mg bolus IV, followed by 50 mg over next 30 min. followed by 35 mg over next 60 min
 Reteplase, double bolus 10 IU 30 min apart
 SK, 1.5 million IU infused over 60 min