

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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copy of the full report or Executive Summary as pub-
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.

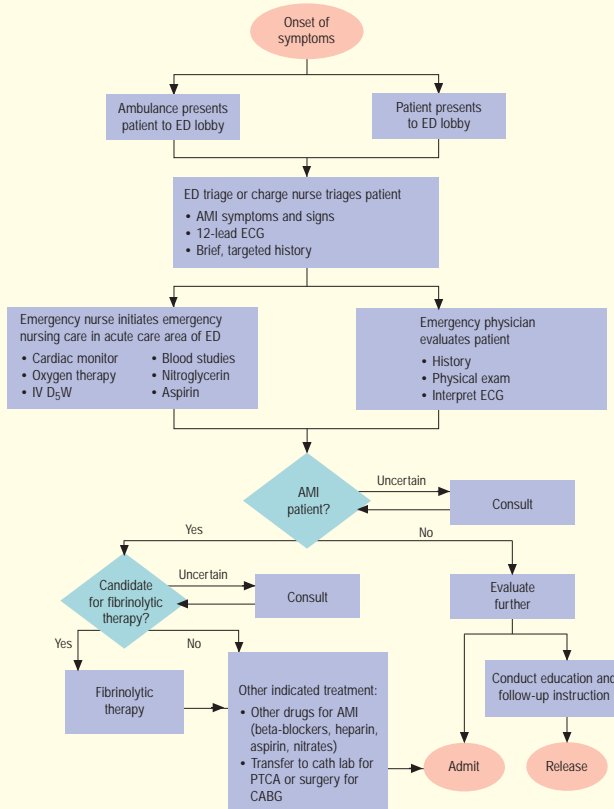
Class IIb Usefulness/efficacy is less well established by evidence/opinion. |
|----------|---|
-
- | | |
|-----------|--|
| Class III | Conditions for which there is evidence and/or general agreement that a procedure/treatment is not useful/effective and in some cases may be harmful. |
|-----------|--|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

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

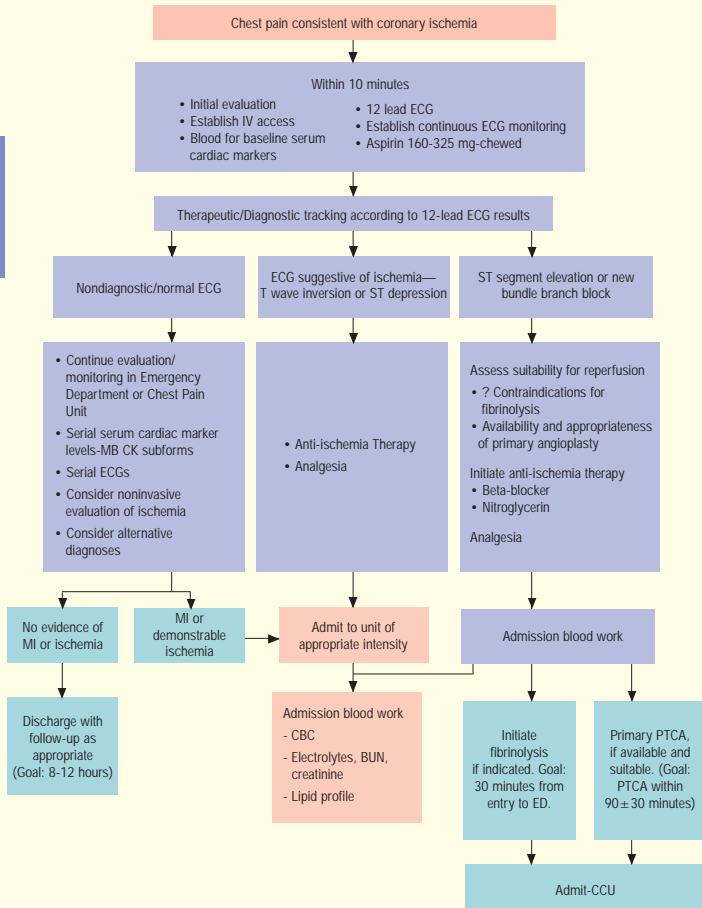
Chest wall

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

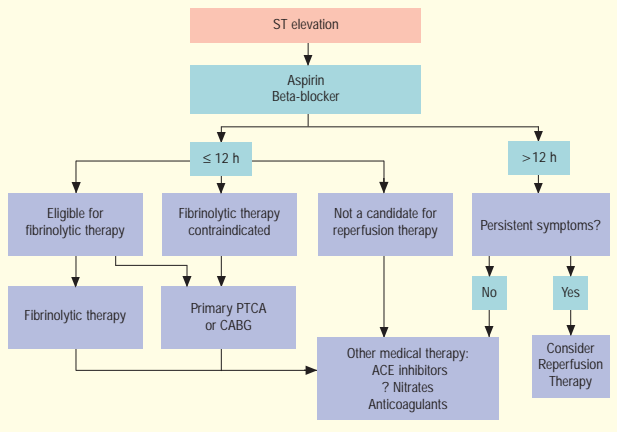
Enzymatic Criteria for Diagnosis of Myocardial Infarction*

- 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.



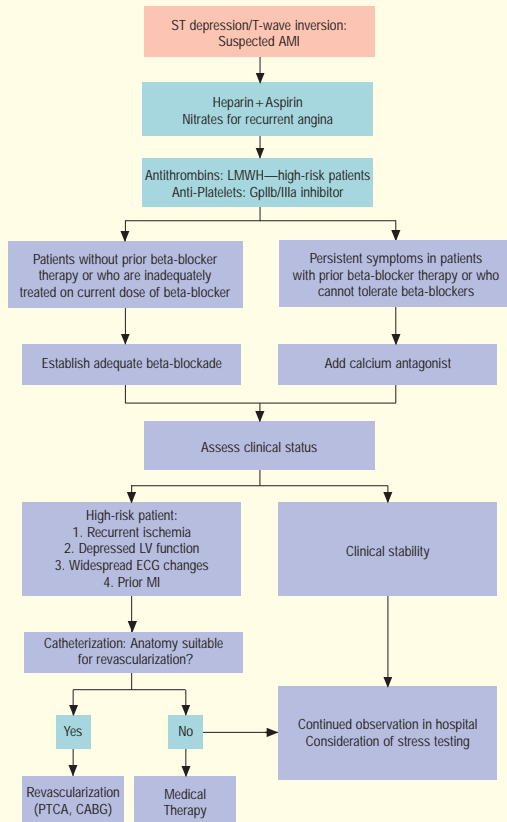
Advantages of Fibrinolytic Therapy

- 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

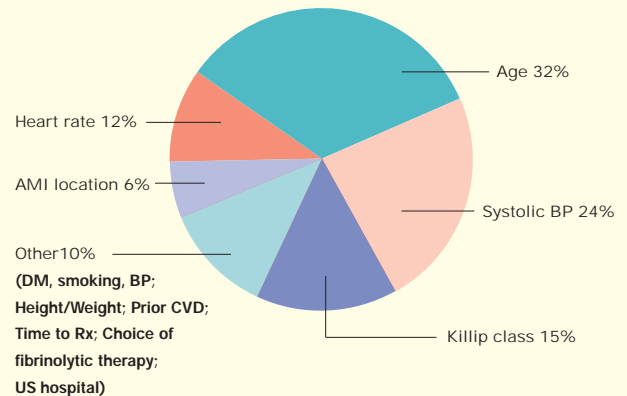


In-Hospital Management

- 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

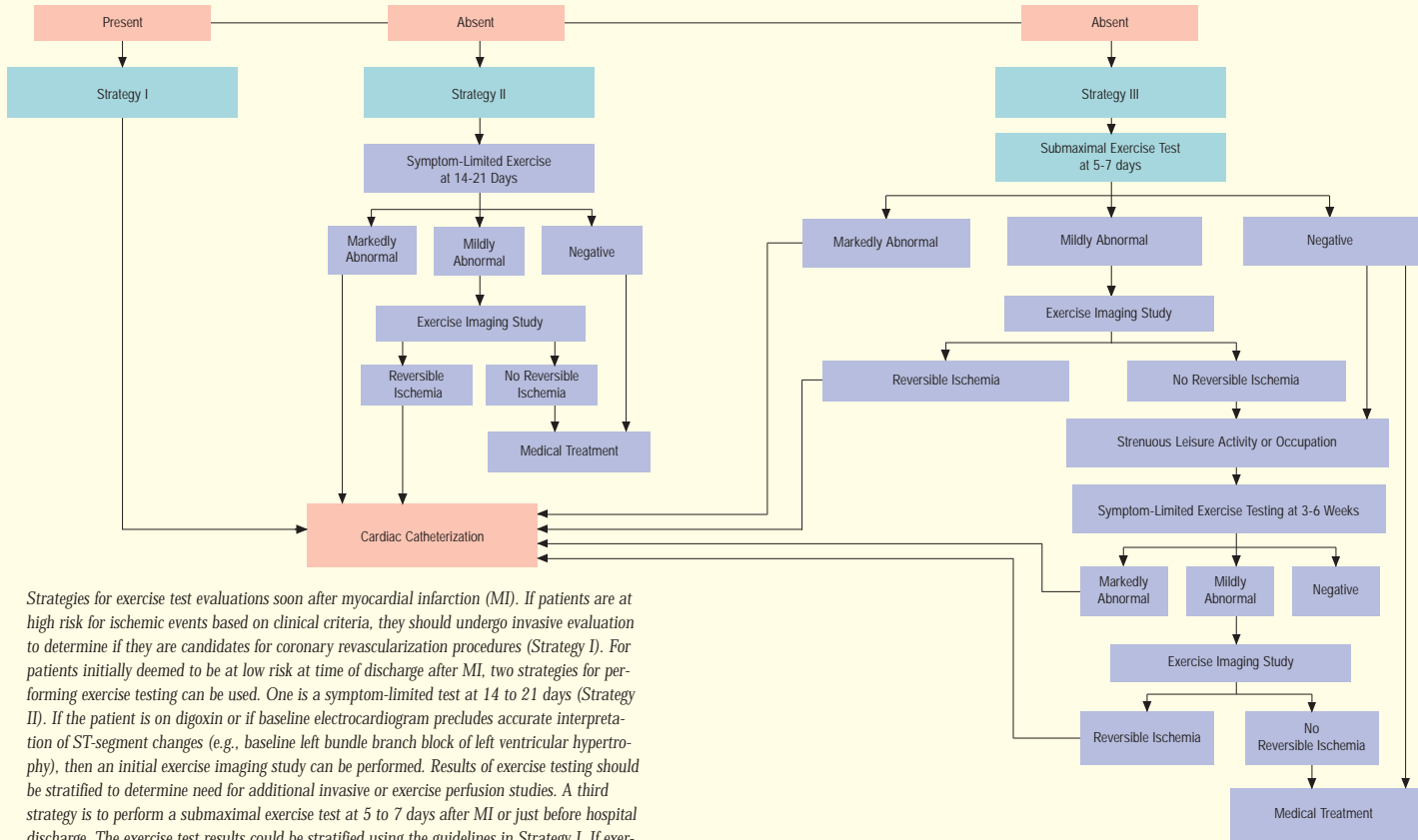


Does not total 100% due to rounding.

*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

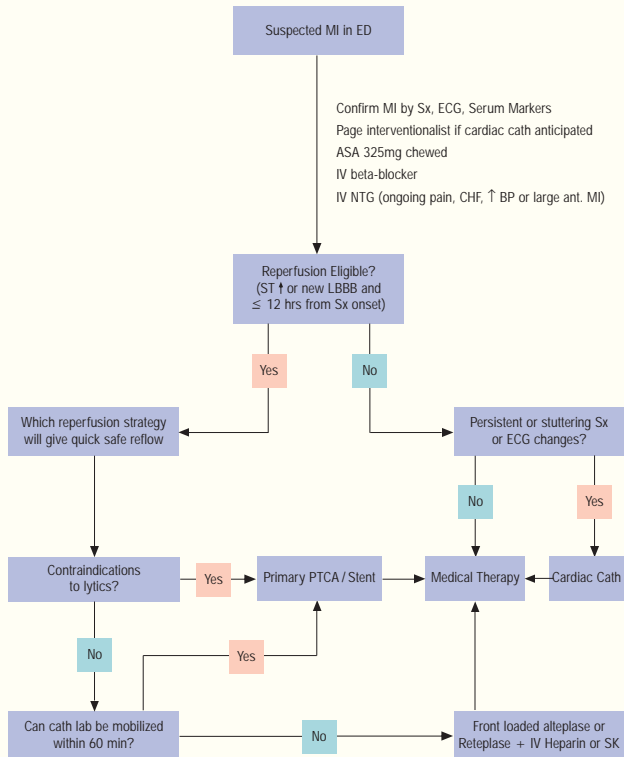
Medication	First 24 Hours	After First 24 Hours	Discharge
Aspirin	Chewed in ED (325mg)	180-325mg qd	81 mg qd indefinitely
Reper for ST [↑] or new LBBB ≤ 12 hrs of symptom onset	Front loaded Rx treatment fibrinolytics* (dosing on back of card) or Primary PTCA	Reperfusion: alteplase/reteplase can be repeated 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 hyperperfusion; 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

The Heart Failure Society of America Practice Guidelines, *HFSA Guidelines for Management of Patients with Heart Failure Caused by Left Ventricular Systolic Dysfunction—Pharmacological Approaches*, was included in the print version of the *ACE-I Change Package*.

The *Guidelines* may be downloaded, free of charge, at:

http://www.hfsa.org/pdf/lvsd_heart_failure.pdf

List of Change Concepts

- A. Eliminate Waste**
 - 1. Eliminate Things That Are Not Used
 - 2. Eliminate Multiple Entry
 - 3. Reduce or Eliminate Overkill
 - 4. Reduce Controls on the System
 - 5. Recycle or Reuse
 - 6. Use Substitution
 - 7. Reduce Classifications
 - 8. Remove Intermediaries
 - 9. Match the Amount to the Need
 - 10. Use Sampling
 - 11. Change Targets or Set Points
- B. Improve Work Flow**
 - 12. Synchronize
 - 13. Schedule into Multiple Processes
 - 14. Minimize Handoffs
 - 15. Move Steps in the Process Close Together
 - 16. Find and Remove Bottlenecks
 - 17. Use Automation
 - 18. Smooth Work Flow
 - 19. Do Tasks in Parallel
 - 20. Consider People as in the Same System
 - 21. Use Multiple Processing Units
 - 22. Adjust to Peak Demand
- C. Optimize Inventory**
 - 23. Match Inventory to Predicted Demand
 - 24. Use Pull Systems
 - 25. Reduce Choice of Features
 - 26. Reduce Multiple Brands of Same Item
- D. Change the Work Environment**
 - 27. Give People Access to Information
 - 28. Use Proper Measurements
 - 29. Take Care of Basics
 - 30. Reduce Demotivating Aspects of Pay System
 - 31. Conduct Training
 - 32. Implement Cross-Training
 - 33. Invest More Resources in Improvement
 - 34. Focus on Core Processes and Purpose
 - 35. Share Risks
 - 36. Emphasize Natural and Logical Consequences
 - 37. Develop Alliance/Cooperative Relationships
- E. Enhance the Producer/Customer Relationship**
 - 38. Listen to Customers
 - 39. Coach Customers to Use Product/Service
 - 40. Focus on the Outcome to a Customer
 - 41. Use a Coordinator
 - 42. Reach Agreement on Expectations
 - 43. Outsource for "Free"
 - 44. Optimize Level of Inspection
 - 45. Work with Suppliers
- F. Manage Time**
 - 46. Reduce Setup or Startup Time
 - 47. Set up Timing to Use Discounts
 - 48. Optimize Maintenance
 - 49. Extend Specialist's Time
 - 50. Reduce Wait Time
- G. Manage Variation**
 - 51. Standardization (Create a Formal Process)
 - 52. Stop Tampering
 - 53. Develop Operational Definitions
 - 54. Improve Predictions
 - 55. Develop Contingency Plans
 - 56. Sort Product into Grades
 - 57. Desensitize
 - 58. Exploit Variation
- H. Design Systems to Avoid Mistakes**
 - 59. Use Reminders
 - 60. Use Differentiation
 - 61. Use Constraints
 - 62. Use Affordances
- I. Focus on the Product or Service**
 - 63. Mass Customize
 - 64. Offer Product/Service Anytime
 - 65. Offer Product/Service Anyplace
 - 66. Emphasize Intangibles
 - 67. Influence or Take Advantage of Fashion Trends
 - 68. Reduce the Number of Components
 - 69. Disguise Defects or Problems
 - 70. Differentiate Product Using Quality Dimensions

Change Concept Definitions

A. Eliminate Waste

In a broad sense, any activity or resource in an organization that does not add value to an external customer can be considered waste.

1. **Eliminate Things That Are Not Used** Constant change in organizations results in less demand for specific resources and activities that were once important to the business. Remove unnecessary activities and unused resources from the system.
2. **Eliminate Multiple Entry** In some situations, information is recorded in a log or entered into a database more than one time, creating no added value. Changing the process to require only one entry can lead to improvement in productivity and quality (by reducing discrepancies).
3. **Reduce or Eliminate Overkill** Sometimes, a company's standard or recommended resources are designed to handle special, severe, or critical situations rather than the normal situation. Changing the standard to the appropriate amount of resources for the normal situation will reduce waste.
4. **Reduce Controls on the System** Individuals and organizations use various types of controls to make sure a process or system does not stray too far from standards, requirements, or accepted practices. A regular review of all the organization's control procedures by everyone in the system can result in identifying opportunities to reduce controls on the system without putting the organization at risk.
5. **Recycle or Reuse** Once a product is created and used for its intended purpose, it is natural to discard it and the by-products created by its use. However, if other uses can be found for the discarded product or by-products, the cost of producing the product can be spread out over its use and its reuse.
6. **Use Substitution** Waste can often be reduced by replacing some aspect of the product or process with a better alternative.
7. **Reduce Classifications** Classifications are often developed to differentiate elements of a system or to group items with common characteristics, but these classifications can lead to system complexity that increases costs or decreases quality. Classification should be reduced when the complexity caused by the classification is worse than the benefit gained.
8. **Remove Intermediaries** Intermediaries such as distributors, handlers, agents, and carriers may be part of a system. Consider eliminating these activities by linking production directly with the consumer. Some intermediaries add value to a process because of their specialized skills and knowledge. Often, however, eliminating these services can increase productivity without reducing value to the customer.
9. **Match the Amount to the Need** Rather than using traditional standard units or sizes, organizations can adjust products and services to match the amount required for a particular situation. This practice reduces waste and carryover inventory.
10. **Use Sampling** Reviews, checks, and measurements are made for a variety of reasons. Formal sampling procedures are available that can often provide as good or even better information than **100** percent checking.
11. **Change Targets or Set Points** Sometimes problems go on for years because some piece of equipment is not designed or set up properly. Make sure process settings are at desirable levels. Investigate places where waste is created, and consider adjustments to targets or set points to reduce waste.

B. Improve Work Flow

Products and services are produced by processes. Can the work flow be changed so that the process is less reactive and more planned?

- 12. Synchronize** Production of products and services usually involve multiple stages. These stages operate at different times and at different speeds, resulting in an operation that is not smooth. By focusing on the flow of the product (or customer) throughout the process, each of the stages can be brought into harmony.
- 13. Schedule into Multiple Processes** A system can be redesigned to include multiple versions of the same process focused on the specific requirements of the situation.
- 14. Minimize Handoffs** Many systems require that elements (a customer, a form, a product, and so on) be transferred to multiple people, offices, or work stations to complete the processing or service. The handoff from one stage to the next can increase time and costs and cause quality problems. By changing the process, the organization structure, or position descriptions, handoffs can be minimized or eliminated and problems reduced.
- 15. Move Steps in the Process Close Together** The physical location of people and facilities can affect processing time and cause communication problems. If the physical location of adjacent steps in a process is moved close together, work can be directly passed from one step to the next. The result of moving steps close together can be lower capital and maintenance costs, reduced inventory, and more frequent improvements.
- 16. Find and Remove Bottlenecks** A bottleneck or constraint is anything that restricts the throughput of a system. A constraint within an organization would be any resource for which the demand is greater than its available capacity. To increase the throughput of a system, identify the constraints, exploited if possible, and removed if necessary.
- 17. Use Automation** The flow of many processes can be improved by the intelligent use of automation. Consider automation to improve the work flow for any process to reduce costs, reduce cycle times, eliminate human slips, reduce repetitive manual tasks, and provide measurement.
- 18. Smooth Work Flow** Yearly, monthly, weekly, and daily changes in demand often cause work flow to fluctuate widely. Steps can be taken to better distribute the demand. This distribution results in a smooth work flow rather than in continual peaks and valleys.
- 19. Do Tasks in Parallel** Many systems are designed so those tasks are done in a series or linear sequence. The second task is not begun before the first task is completed. Sometimes, improvements in time and costs can be gained from designing the system to do some or all tasks in parallel. For example, the work on step 5 can begin as soon as step 1 is complete rather than waiting until steps 2, 3, and 4 are done.
- 20. Consider People in the Same System** People in different systems are usually working toward different purposes, each trying to optimize their own system. Taking actions that help people to think of themselves as part of the same system can give them a common purpose and provide a basis for optimizing the larger system.
- 21. Use Multiple Processing Units** To gain flexibility in controlling the work flow, try to include multiple work stations, machines, processing lines, and fillers in a system. This makes it possible to run smaller lots, serve special customers, minimize the impact of maintenance and downtime, and add flexibility to staffing.
- 22. Adjust to Peak Demand** Sometimes it is not possible to balance the demands made on a system. In these cases, rather than keeping a fixed amount of resources (materials,

workers, and so on), historical data can be used to predict peak demands. Methods can then be implemented to meet the temporarily increased demand.

B. Optimize Inventory

Inventory of all types is a possible source of waste in organizations. Inventory requires capital investment, storage space, and people to handle and keep track of it. Extra inventory can result in higher costs with no improvement in performance for an organization. An understanding of where inventory is stored in a system is the first step in finding opportunities for improvement.

23. Match Inventory to Predicted Demand Using historical data to predict demand is one approach to minimizing the costs associated with inventory. This can help determine the proper amount of inventory to be maintained at any given time.

24. Use Pull Systems In a pull system of production, work at a particular step in the process is done only if the next step in the process is demanding the work.

25. Reduce Choice of Features Many features are added to products and services to accommodate the desires and wants of different customers and different markets. A review of current demand for each feature and consideration of grouping the features can allow a reduction in inventory without loss of customer satisfaction.

26. Reduce Multiple Brands of Same Items If an organization uses more than one brand of any particular item, inventory costs will usually be higher than necessary since a backup supply of each brand must be kept. Consider ways to reduce the number of brands while still providing the required service.

D. Change the Work Environment

Changes to the environments in which people work, study, and live can often provide leverage for improvements in performance.

27. Give People Access to Information Traditionally, organizations have carefully controlled the information available to various groups of employees. Making information available to employees relevant to their jobs allows them to suggest changes, make good decisions, and take actions that lead to improvements.

28. Use Proper Measurements Measurement plays an important role in focusing people on particular aspects of a business. In many organizations, the things that are measured are considered important while the things not measured are considered unimportant. Developing appropriate measures, making better use of existing measures, and improving measurement systems can lead to improvement throughout the system.

29. Take Care of Basics There are certain fundamentals that must be done to make any organization successful. It is sometimes useful to take a fresh look at these basics to see whether the organization is still on track. Examples of fundamentals in an organization are orderliness, cleanliness, discipline, and managing costs and prices.

30. Reduce Demotivating Aspects of the Pay System Pay is rarely a positive motivator in an organization, but it can cause confusion and become a demotivator. Review of the organization's system for pay ensures that the current system does not cause problems in the organization.

31. Conduct Training Training is basic to quality performance and the ability to make changes for improvement. Many changes will not be effective if people have not received

the basic training required to do a job. Training should include the “why” as well as the “what” and the “how.”

- 32. Implement Cross-Training** Cross-training means training people in an organization to do multiple jobs. Such training allows for flexibility and makes changes easier. The investment required for the extra training will pay off in productivity, product quality, and cycle times.
- 33. Invest More Resources in Improvement** In some organizations, people spend more than a full-time job getting their required tasks completed and fighting the fires created in their work. The only changes made are reactions to problems or changes mandated outside the organization. To break out of this trap, management must learn how to start investing time in developing, testing, and implementing changes that will lead to improvements.
- 34. Focus on Core Processes and Purpose** Why are people doing all of the activities that go on in the organization? Which activities are directly related to the purpose of the organization? These are the core processes. Core processes can also be characterized as those activities that provide value directly to external customers. To reduce costs, consider reducing activities that are not part of the core processes.
- 35. Share Risks** Every business is faced with taking risks, and their accompanying potential rewards or losses. Many people become more interested in the performance of their organization when they can clearly see how their future is tied to the long-term performance of the organization. Developing systems that allow all employees to share in the risks can lead to an increased interest in performance.
- 36. Emphasize Natural and Logical Consequences** An alternative approach to traditional reward-and-punishment systems in organizations is to focus on “natural and logical consequences.” Natural consequences follow from the natural order of the physical world (for example, not eating leads to hunger), while logical consequences follow from the reality of the business or social world (for example, if you are late for a meeting, you will not have a chance to have input on some of the issues discussed). The idea of emphasizing natural and logical consequences is to get everyone to be responsible for their own behavior rather than to use power, judge others, and force submission.
- 37. Develop Alliances/Cooperative Relationships** During recent years, many industries have gone through a period of consolidation, acquisition, and merger. Often the result is fewer and larger organizations in an industry, but not much effort to integrate the pieces into an overall system. Various types of alliances based on the principle of cooperation to optimize the interactions between the parts of the system offer a better approach for integration of organizations.

E. Enhance the Producer/Customer Relationship

The interface between the producer/provider and its customers provides opportunities to learn and develop changes that will lead to improvement.

- 38. Listen to Customers** It is easy for people to get caught up in the internal functioning of the organization and forget why they are in business: to serve their customers. Time should be invested on a regular basis in processes that “listen” to the customers.
- 39. Coach Customers to Use the Product/Service** Customers often encounter quality problems and actually increase their costs because they do not understand all of the intricacies of the product or service. Companies can increase the value of their products and services by developing ways to coach customers and consumers on how to use them.

- 40. Focus on the Outcome to a Customer** Make the outcome (product or service) produced by your organization the focus of all activities.
- 41. Use a Coordinator** A coordinator's primary job is to manage producer/customer linkages. A coordinator can also be used to work with customers to provide extra services.
- 42. Reach Agreement on Expectations** Many times customer dissatisfaction occurs because the customers feel that they have not received the products or services they were taught to expect as a result of advertising, special promotions, and promises by the sales group. Clear expectations should be established before the product is produced or the service is delivered to the customer.
- 43. Outsource for "Free"** Sometimes it is possible to get suppliers to perform additional functions for the customer with little or no increase in the price to the customer.
- 44. Optimize Level of Inspection** A study of the level of inspection can potentially lead to changes that increase quality of outcomes to the customers and/or decrease costs. Options for inspection at any given place in the supply chain are: no inspection, 100 percent inspection, or reduction or increases to the current level of inspection.
- 45. Work with Suppliers** Inputs to a process sometimes control the costs and quality of performance of a process. Working with suppliers to use their technical knowledge can often reduce the cost of using their products or services.

F. Manage Time

An organization can gain a competitive advantage by reducing the time to develop new products, waiting times for services, lead times for orders and deliveries, and cycle times for all functions in the organization.

- 46. Reduce Setup or Startup Time** Time can be lost and costs increased while getting ready to produce a product or service. Minimizing setup or startup time allows the organization to maintain lower levels of inventory and get more productivity out of its assets.
- 47. Set up Timing to Use Discounts** The planning and timing of many activities can be coordinated to take advantage of savings and discounts that are available.
- 48. Optimize Maintenance** Through proper design and the study of historical data, an efficient maintenance program can be designed to keep equipment in production with a minimum of downtime for maintenance. Learning to observe and listen to equipment before it breaks down is also an important component of any plan to optimize maintenance.
- 49. Extend Specialists' Time** Organizations employ specialists who have specific skills or knowledge, but not all of their work duties use these skills or knowledge. Try to remove assignments and job requirements that do not use the specialists' skills.
- 50. Reduce Wait Time** Reduction in wait time can lead to improvements in many types of services. This applies to the time to perform a service to the customer and the time it takes the customer to use or maintain a product.

G. Manage Variation

Many quality and cost problems in a process or product are due to variation. Reduction of variation will improve the predictability of outcomes (and may actually exceed customer expectations) and help to reduce the frequency of poor results.

- 51. Standardization (Create a Formal Process)** An appropriate amount of standardization can provide a foundation upon which improvement in quality and costs can be built. Standardization is one of the primary methods for reducing variation in a system.

- 52. Stop Tampering** Tampering is defined as interfering so as to weaken or change for the worse. Changes made based on the last result observed or measured often increase the variation in a process or product.
- 53. Develop Operational Definitions** Reduction of variation can begin with a common understanding of concepts commonly used in the transaction of business. The meaning of a concept is ultimately found in how that concept is applied. An operational definition will usually have two parts: (1) a measurement procedure, and (2) criteria for judgment.
- 54. Improve Predictions** Plans, forecasts, and budgets are based on predictions. The study of variation from past predictions can lead to alternative ways to improve the predictions.
- 55. Develop Contingency Plans** Variation in everyday life often creates problems. Reducing the variation might eventually eliminate the problems, but how do people survive in the meantime? One way is to prepare backup plans, or contingencies, to deal with the unexpected problems.
- 56. Sort Product into Grades** Ways of sorting the product or service into different grades can be designed to minimize the variation within a grade and maximizing the variation among grades can be developed. The different grades can then be marketed to different customer needs.
- 57. Desensitize** It is impossible to control some types of variation: between students in a class, among the ways customers try to use a product, in the physical condition of patients who enter the hospital. How can the impact on the outcome (education, function and health) be minimized when this variation is present? It can be done by desensitizing or causing a nonreaction to some stimulus. This change concept focuses on desensitizing the effect of variation rather than reducing the incidence of variation.
- 58. Exploit Variation** It sometimes is not obvious how variation can be reduced or eliminated. Rather than just accepting or "dealing with" the variation, ways can be developed to exploit it. This change concept deals with some ways to turn the negative variation into a positive method to differentiate products or services.

H. Design Systems to Avoid Mistakes

Mistakes (also called errors or slips) occur when actions do not agree with intentions, even though one is capable of carrying out the task.

- 59. Use Reminders** Many mistakes are made by forgetting to do something. Reminders are aids for remembering.
- 60. Use Differentiation** Mistakes can occur when people are dealing with things that look similar. Mistakes can also occur when actions are similar. Steps taken to break patterns can reduce mistakes. Examples are color coding, sizing, using different symbols, or separating similar things.
- 61. Use Constraints** A constraint restricts the performance of certain actions. Constraints can limit the actions that result in mistakes. Constraints can be built into a process to prevent an accidental stopping or an unwanted action that will result in a mistake.
- 62. Use Affordances** An affordance provides insight, without the need for explanation, into how something should be used. If a process or product can be designed to lead the user to perform the correct actions, fewer mistakes will occur.

I. Focus on the Product or Service

Most of the change concepts in the other categories address the way that a process is performed. Other change concepts can be useful for developing changes to a product or service that do not fit naturally into any of the other groupings.

- 63. Mass Customize** To mass customize means combining the uniqueness of customized products with the efficiency of mass production.
- 64. Offer the Product or Service Anytime** Many products and services are available only at certain times. Constraints almost always detract from the quality of the product or service. Constraint is created because it is more convenient for the provider of the service than for the customer. "Anytime" is an important concept for expanding the expectations of customers.
- 65. Offer the Product or Service Anyplace** An important dimension of quality for most products and services is convenience. To make a product or service more convenient, free it from the constraints of space. A product or service that can be made available in the customer's space, expands the customer's expectations.
- 66. Emphasize Intangibles** Opportunities for improvement can be found by embellishing the product with intangible aspects. Three ways to accomplish this are by miniaturizing, by providing information (electronically or otherwise), and by developing producer-customer relationships.
- 67. Influence or Take Advantage of Fashion Trends** Quality is defined as much by aesthetics as by utility. Often the utility of the product is assumed and the aesthetics are what change the expectations of customers. Trends in public opinion have an aspect of fashion to them and as such are also a source of ideas for new or redesigned products.
- 68. Reduce the Number of Components** Reducing the number of component parts is a way to simplify a product. Benefits accrue to the manufacturer, to the customer, and to those who repair or maintain the product.
- 69. Disguise Defects and Problems** In the short term it may be better to hide the defect in a product or service than to remove it. Included in this category are actions taken to make the defect more palatable to the customer. Excluded in this change concept is false advertising, and defects that are hidden at the time of sale only to emerge in later use of the product.
- 70. Differentiate Product Using Quality Dimensions** Quality is improved as the match between products and services and the needs they are designed to satisfy is improved.

Adapted from:

Gerald J. Langley, Kevin M. Nolan, Thomas W. Nolan, Clifford L. Norman, Lloyd P. Provost (1996),
The Improvement Guide, A Practical Approach to Enhancing Organizational Performance.

Web Links

Agency for Healthcare Research and Quality

<http://www.ahrq.gov/>

The Agency for Healthcare Research and Quality (AHRQ) Web site offers clinical statements, guidelines, information for consumers and patients, and data/survey information.

American College of Cardiology

<http://www.acc.org>

The American College of Cardiology (ACC) Web site features guidelines, clinical statements, and the latest news from ACC's scientific sessions.

American Heart Association

<http://www.americanheart.org/>

The American Heart Association (AHA) Web site provides information for health care professionals and patients, including guidelines and references. "Get With the Guidelines" is prominently featured.

Arizona Acute Care Quality Initiative

<http://acute.hsag.com>

The HSAG-sponsored Web site for the Arizona Acute Care Quality Initiative contains information from the various hospital projects that are underway in the current Scope of Work. These include: the Hospital Workgroup (HoW), the Hospital Public Reporting Pilot (HPRP), the Arizona Rural Hospital Flexibility Program, the Arizona Surgical Infection Prevention Program, etc.

Heart Failure Society of America

<http://www.hfsa.org>

The Heart Failure Society of America (HFSA) provides guidelines, education modules, online Continuing Medical Education (CME), and the *Journal of Cardiac Failure* on its Web site.

MedQIC

<http://www.medqic.org>

The Centers for Medicare & Medicaid Services (CMS) has created this comprehensive online resource of quality improvement information for Medicare's National Quality Improvement Priority Topics.

Quality Net Exchange e-Learning Center

<https://ifmcevents.webex.com>

This Web site provides recorded WebEx presentations. The programs easily lend themselves to being shared in team meetings, as they only require a computer with modem capabilities. There are a variety of topics for the viewer to choose from; many of the speakers have national name recognition. To access this site:

1. Open your Web browser
2. Type in <https://ifmcevents.webex.com> and hit enter
3. On the left side of the screen, click on “Recorded Events”
4. Locate the name of the event
5. Click on the “View” button
6. Enter information as prompted

Examples of recent WebEx presentations:

- ♥ March 2, 2004
Heart Failure Standing Orders
Richard Schaefer, MD, Cardiologist
Rogue Valley Medical Center, Medford, Oregon
- ♥ February 19, 2004
Management of Heart Failure in the ED
W. Frank Peacock, MD
The Cleveland Clinic, Cleveland, Ohio
- ♥ February 18, 2004
Day-to-day Approaches to Patients with Heart Failure
Jane Pederson, MD, MS
Stratis Health
- ♥ February 11, 2004
Controversial Measures in Heart Care Treatment
Joyce Pontbriand
- ♥ January 22, 2004
Heart Failure Discharge Documentation Initiative
Michigan Chapter—ACC, MPRO Staff, BC/BS of Michigan
- ♥ January 20, 2004
ACE Inhibitors over ARBs
Richard Delaney, JD, MPH
Colorado Foundation for Medical Care