The Management of Patients with Acute Myocardial Infarction

ACC/AHA Pocket Guidelines
April, 2000
Classification of Indications

- **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 the procedure/treatment is not useful/effective and in some cases may be harmful
The Management of Patients with Acute Myocardial Infarction

Initial Assessment and Evaluation
Emergency Department Algorithms/Protocol for Patients with Symptoms and Signs of AMI

Onset of symptoms

Ambulance presents patient to ED lobby

Patient presents to ED lobby

ED triage or charge nurse triages patient
• AMI symptoms and signs
• 12-lead ECG
• Brief, targeted history

Emergency nurse initiates emergency nursing care in acute care area of ED
• Cardiac monitor
• Oxygen therapy
• IV D5W
• Blood studies
• Nitroglycerin
• Aspirin

Emergency Physician evaluates patient
• History
• Physical exam
• Interpret ECG

AMI patient?
Emergency Department Algorithms/Protocol for Patients with Symptoms and Signs of AMI

AMI patient? Yes

Candidate for fibrinolytic therapy

Yes

Fibrinolytic therapy

No

Consult

Uncertain

Evaluate further

Conduct education and follow-up instruction

Other indicated treatment:
- Other drugs for AMI (beta-blockers, heparin, aspirin, nitrates)
- Transfer to cath lab for PTCA or surgery for CABG

Admit

Yes

No

Release
Differential Diagnosis of Prolonged Chest Pain

- AMI
- Aortic dissection
- Pericarditis
- Atypical angina 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

Within 10 minutes
- Initial evaluation
- Establish IV
- Establish continuous ECG monitoring
- Blood for baseline serum cardiac markers

Chest pain consistent with coronary ischemia

Therapeutic/Diagnostic tracking according 12-lead ECG results

- Nondiagnostic / normal ECG
- ECG suggestive of ischemia - T wave inversion or ST depression
- ST segment elevation or new bundle branch block
Patient with Acute Chest Pain with non-diagnostic and normal ECG

- Continue evaluation/monitoring in Emergency Department or Chest Pain Unit
- Serial serum cardiac marker levels - MB CK subforms
- Serial ECGs
- Consider noninvasive evaluation of ischemia
- Consider alternative diagnoses

Non-diagnostic / normal ECG

- No Evidence of MI or ischemia
  - Discharge with follow-up as appropriate (Goal: 8-12 hours)

- MI or demonstrable ischemia
  - Admit to unit of appropriate intensity
Patient with Acute Chest Pain with T-wave inversion or ST depression

ECG suggestive of ischemia - T wave inversion or ST depression

- Anti-ischemia Therapy
- Analgesia

Admit to unit of appropriate intensity

Admission blood work
- CBC
- Electrolytes, BUN, creatinine
- Lipid profile

Differential diagnosis
- ischemia
- acute posterior MI
- ventricular hypertrophy
- digoxin effect
- pericarditis
- pulmonary embolus
- LBBB
- hyperventilation
- anxiety
- normal variants
Patient with Acute Chest Pain with ST elevation or new bundle branch block

- ST segment elevation or new bundle branch block
  - Assess suitability for reperfusion
    - ? Contraindications for fibrinolysis
    - Availability and appropriateness of primary angioplasty
    - Initiate anti-ischemia therapy
      - Beta-blocker
      - Nitroglycerine
      - Analgesia

  - Admission blood work

  - Initiate fibrinolysis if indicated
    - Goal: 30 minutes from entry to ED
  - Primary PTCA if available and suitable
    - Goal: PTCA within 90 ± 30 minutes

  - Admit - CCU
Acute Inferior Wall MI

http://homepages.enterprise.net/djenkins/ecghome.html
Acute Posterior Wall MI

http://homepages.enterprise.net/djenkins/ecghome.html
AMI in the Presence of LBBB

http://homepages.enterprise.net/djenkins/ecghome.html
Chest Pain Checklist

YES
- Ongoing chest discomfort (≥ 20 min and < 12 hours)
- Oriented, can cooperate
- Age > 35 y (≥ 40 if female)
- ECG done
- **High-risk profile** *
  - Heart rate ≥ 100 bpm
  - Blood pressure ≤ 100 mm Hg
  - Pulmonary edema (rales > 1/2 way up)
  - Shock

NO
- History of stroke or TIA
- Known bleeding disorder
- Active internal bleeding in past two weeks
- Surgery or trauma in past two weeks
- Terminal illness
- Jaundice, hepatitis, kidney failure
- Use of anticoagulants

- **Systolic/diastolic blood pressure**
  - Right arm ____/____  Left arm ____/____

- 1. Pain began ____ AM/PM
- 2. Arrival time ____ AM/PM
- 3. Begin transport ____ AM/PM
- 4. Hospital arrival ____ AM/PM

Check each finding. 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 ≤ 180/110 mm Hg.

* Transport to a facility capable of angiography and revascularization if needed

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
- Increasing 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
The Management of Patients with Acute Myocardial Infarction

Initial Management
Management of Patients with ST Elevation

ST elevation

Aspirin
Beta-blocker

≤ 12 h

Fibrinolytic therapy

Primary PTCA or CABG

Other medical therapy:
ACE inhibitors
? Nitrates
Anticoagulants

> 12 h

Not a candidate for reperfusion therapy

Persistent symptoms?

No

Yes

Consider Reperfusion Therapy

Eligible for fibrinolytic therapy

Fibrinolytic therapy

Modified from Antman EM. Atlas of Heart Disease, VIII; 1996
## Comparison of Approved Fibrinolytic Agents

<table>
<thead>
<tr>
<th></th>
<th>Streptokinase</th>
<th>Anistreplase</th>
<th>Alteplase</th>
<th>Reteplase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose</strong></td>
<td>1.5 MU in 30-60 min</td>
<td>30 mg in 5 min</td>
<td>100 mg in 90 min</td>
<td>10U x 2 over 30 min</td>
</tr>
<tr>
<td><strong>Bolus administration</strong></td>
<td>NO</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Antigenic</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Allergic reactions</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>(mostly hypotension)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Systemic fibrinogen depletion</strong></td>
<td>Marked</td>
<td>Marked</td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>90-min patency rate</strong></td>
<td>~50%</td>
<td>~65%</td>
<td>~75%</td>
<td>~75%</td>
</tr>
<tr>
<td><strong>TIMI-3 flow</strong></td>
<td>32%</td>
<td>43%</td>
<td>54%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Mortality rate</strong></td>
<td>7.3%</td>
<td>10.5%</td>
<td>7.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td><strong>Cost /dose (US)</strong></td>
<td>$294</td>
<td>$2116</td>
<td>$2196</td>
<td>$2196</td>
</tr>
</tbody>
</table>
Contraindications and Cautions for Fibrinolytic Used in Myocardial Infarction

Absolute Contraindications:

• Previous hemorrhagic stroke at any time: other strokes or cerebrovascular events within one year
• Known intracranial neoplasm
• Active internal bleeding (does not include menses)
• Suspect aortic dissection
Contraindications and Cautions for Fibrinolytic Used in Myocardial Infarction

Cautions / Relative Contraindications

- Severe uncontrolled HTN on presentation (BP > 180/110 mmHg)
- History of prior CVA or known intra-cerebral pathology not covered in contraindications
- Current use of anticoagulants in therapeutic doses (INR ≥ 2-3); no bleeding diathesis
- Recent trauma (within 2-4 weeks) including head trauma
- Noncompressible vascular punctures
- Recent (within 2-4 weeks) internal bleeding
- For streptokinase/anistreplase: prior exposure (especially within 5d-2 yrs) or prior allergic reaction
- Pregnancy
- Active peptic ulcer
- History of chronic hypertension
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 environment
2. In cardiogenic shock patients < 75 yrs or within 36 hrs of AMI and revascularization can be performed within 18 hrs of onset of shock

Class IIa Recommendations
1. As reperfusion strategy in candidates for reperfusion who have contraindications to fibrinolytic therapy
Primary Percutaneous Transluminal Coronary Angioplasty Recommendations

Class IIb Recommendations
1. In patients with AMI who do not present with ST elevation but who have reduced (< TIMI 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 the non-infarct-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 costs
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
Management of Patients with Non-ST Elevation MI

ST depression/T-wave inversion: Suspected AMI

Heparin + Aspirin
Nitrates for recurrent angina

Assess Clinical Status

High-risk patient:
1. Recurrent ischemia
2. Depressed LV function
3. Widespread ECG changes
4. Prior MI

Clinical stability

Antithrombins: LMWH - high-risk patients
Anti-Platelets: GpIIb/IIIa inhibitor

Persistent symptoms in patients with prior beta-blocker therapy or who cannot tolerate beta-blockers

Medical Therapy

No

Add calcium antagonist

Catheterization: Anatomy suitable for revascularization

Yes

Continued observation in hospital
Consideration of stress testing

Establish adequate beta-blockade

PCI
CABG

Patients without prior beta-blocker therapy or who are inadequately treated on current dose of beta-blocker

No

Establish adequate beta-blockade

Patients without prior beta-blocker therapy or who are inadequately treated on current dose of beta-blocker

Catabolism: Anatomy suitable for revascularization

Yes

Medical Therapy

No

Antithrombins: LMWH - high-risk patients
Anti-Platelets: GpIIb/IIIa inhibitor

Patients without prior beta-blocker therapy or who are inadequately treated on current dose of beta-blocker

Establish adequate beta-blockade
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 (note change in recommendations)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolus Dose</td>
<td>60 U/kg</td>
<td>70 U/kg</td>
</tr>
<tr>
<td>Maintenance</td>
<td>~12 U/kg/hr</td>
<td>~15 U/kg/hr</td>
</tr>
<tr>
<td>Maximum</td>
<td>4000 U bolus</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>1000 U/h if &gt;70kg</td>
<td></td>
</tr>
<tr>
<td>aPTT</td>
<td>1.5-2.0 x control</td>
<td>1.5-2.0 x control</td>
</tr>
</tbody>
</table>
Pharmacologic Management of Patients with MI
Heparin Recommendations

Class IIa Recommendations (continued)

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).
Pharmacologic Management of Patients with MI

Heparin Recommendations

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 (streptokinase, anistreplase, urokinase) who are not at high risk for systemic embolism
Pharmacologic Management of Patients with MI
GP IIb/IIIa Inhibitors - New Recommendations

Class IIa Recommendations

1. 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
## Classification of Inotropic Agents

<table>
<thead>
<tr>
<th>Agent</th>
<th>Mechanism</th>
<th>Inotropic</th>
<th>Vascular Effect</th>
<th>Major Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isoproterenol</td>
<td>β-1 receptor</td>
<td>++</td>
<td>Dilatation</td>
<td>Hypotension due to bradycardia; no pacing available</td>
</tr>
<tr>
<td>Dobutamine</td>
<td>β-1 receptor</td>
<td>++</td>
<td>Mild dilatation</td>
<td>Low output with SBP &gt;90 mm Hg</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Low dose: (dopaminergic)</td>
<td>++</td>
<td>Renovascular dilatation</td>
<td>Hypoperfusion with SBP &lt;90 mm Hg or ≥30 mm Hg below usual value</td>
</tr>
<tr>
<td></td>
<td>Medium dose: (β-1 receptor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High dose: (α-receptor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>α- receptor</td>
<td>++</td>
<td>Intense constriction</td>
<td>Extreme hypotension despite dopamine use</td>
</tr>
<tr>
<td>Amrinone</td>
<td>PDE inhibitor</td>
<td>++</td>
<td>Dilatation</td>
<td>Second-tier agent after failure of dopamine / dobutamine</td>
</tr>
<tr>
<td>Milrinone</td>
<td>PDE inhibitor</td>
<td>++</td>
<td>Dilatation</td>
<td></td>
</tr>
<tr>
<td>Digitalis</td>
<td>Inhibits Na⁺-K⁺ pump</td>
<td>+</td>
<td>Variable</td>
<td>Established systolic LV dysfunction and symptoms of heart failure for</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>chronic therapy</td>
</tr>
</tbody>
</table>
The Management of Patients with Acute Myocardial Infarction

Hospital Management
### Sample Admitting Orders

<table>
<thead>
<tr>
<th>Condition</th>
<th>Serious</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>NS or D$_5$W to keep vein open</td>
</tr>
<tr>
<td>Vital signs</td>
<td>q 1/2 hr until stable, the q 4 hrs and p.r.n. Notify if HR &lt;60 or &gt;110; BP &lt;90 or &gt;150; RR &lt;8 or &gt;22. Pulse oximetry x 24 hrs</td>
</tr>
<tr>
<td>Activity</td>
<td>Bed rest with bedside commode and progress as tolerated after approximately 12 hrs</td>
</tr>
<tr>
<td>Diet</td>
<td>NPO until pain free, then clear liquids. Progress to a heart-healthy diet</td>
</tr>
<tr>
<td>Medications</td>
<td>Nasal O$_2$ 2L/min x 3 hrs Enteric-coated aspirin daily (165 mg) Stool softener daily Beta-adrenoreceptor blockers ? Consider need for analgesics, nitroglycerin, anxiolytic</td>
</tr>
</tbody>
</table>
Heart-Healthy Diet

- complex carbohydrates = 50-55% of kilocalories
- unsaturated fats (≤ 30% of kilocalories)
- foods high in:
  - potassium (eg. fruits, vegetables, whole grains, dairy products)
  - magnesium (eg. green leafy vegetables, whole grains, beans, seafood)
  - fiber (eg. fresh fruits and vegetables, whole-grain breads, cereals)
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)
Treatment Strategy for Right Ventricular Ischemia/Infarction

• Reduced right ventricular afterload with LV dysfunction
  – Intra-aortic balloon pump
  – Arterial vasodilators (sodium nitroprusside, hydralazine)
  – ACE inhibitors

• Reperfusion
  – Fibrinolytic agents
  – Primary PTCA
  – CABG (in selected patients with multivessel disease)
# Clinical Profile of Mechanical Complications of Myocardial Infarction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ventricular Septal Defect</th>
<th>Free Wall Rupture</th>
<th>Papillary Muscle Rupture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, years)</td>
<td>63</td>
<td>69</td>
<td>65</td>
</tr>
<tr>
<td>Days post MI</td>
<td>3-5</td>
<td>3-6</td>
<td>3-5</td>
</tr>
<tr>
<td>Anterior MI</td>
<td>66%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>New Murmur</td>
<td>90%</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Palpable thrill</td>
<td>Yes</td>
<td>No</td>
<td>Rare</td>
</tr>
<tr>
<td>Previous MI</td>
<td>25%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Echo: 2-D</td>
<td>Visualize defect</td>
<td>May have PE</td>
<td>Flail or prolapsing leaflet</td>
</tr>
<tr>
<td>Doppler</td>
<td>Detect shunt</td>
<td></td>
<td>Regurgitating jet in LA</td>
</tr>
<tr>
<td>PA catheterization</td>
<td>Oxygen step up</td>
<td>Equalization of</td>
<td>Prominent V-wave in</td>
</tr>
<tr>
<td></td>
<td>Hi RV</td>
<td>diastolic pressure</td>
<td>PCW tracing</td>
</tr>
<tr>
<td>Mortality: Medical</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Surgical</td>
<td>50%</td>
<td>Case report</td>
<td>40-90%</td>
</tr>
</tbody>
</table>

The Management of Patients with Acute Myocardial Infarction

MI Management Summary
Initial Management in ED

• Initial evaluation with 12-lead ECG in < 10 minutes
  – targeted history (for AMI inclusion, thrombolysis exclusion)
  – vital signs, focused examination
• Continual ECG, automated BP, HR monitoring
• IV access
• Draw blood for serum cardiac markers, electrolytes, magnesium, hematology, lipid profile panel
Initial Management in ED

- Aspirin 165-325 mg (chew and swallow)
- Sublingual NTG unless SBP < 90 or HR < 50 or > 100: test for Prinzmetal angina, reversible spasm, anti-ischemic, antihypertensive effects
- O₂ by nasal prolongs, first 2-3 h in all; continue if P_{a}O₂ < 90%
- Analgesia: small doses of morphine (2-4 mg) as needed
- Fibrinolysis or PCI if ST elevation > 1mV or LBBB (Goal: door-needle < 30 min or door-dilatation < 60-90 min)
MI Management in 1st 24 Hours

- Limited activity for 12 hours, monitor ≥ 24 hours
- No prophylactic antiarrhythmics
- IV heparin if: a) large anterior MI; b) PTCA; c) LV thrombus; or d) alteplase/reteplase use (for ~48 hours)
- SQ heparin for all other MI (7,500 u b.i.d.)
- Aspirin indefinitely
- IV NTG 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 q 4-6 hrs
• CHF - ACE inhibitor and diuretic as needed
• Shock - consider intra-aortic balloon pump + cath with PCI or CABG
• RV MI - fluids (NS) + inotropics if hypotensive
Predictors of 30 day Mortality in Fibrinolysis Patients
GUSTO Trial - 41,021 patients

- Age 32%
- Systolic BP 24%
- AMI Location 6%
- Killip class 15%
- Heart rate 12%
- Other 10%

(DM, smoking, BP; Height/Weight, Prior CVD; Time to Rx; Choice of fibrinolytic therapy; US hospital)
Clinical Indications of High Risk At Predischarge

- **Present**
  - **Strategy I**
    - Symptom-Limited Exercise Test at 14-21 Days
      - Markedly Abnormal
        - Exercise Imaging Study
          - Reversible Ischemia
            - Medical Treatment
          - No Reversible Ischemia
        - Medical Treatment
      - Mildly Abnormal
      - Negative
    - Cardiac Catheterization

- **Absent**
  - **Strategy II**
    - Submaximal Exercise Test at 5-7 Days
      - Markedly Abnormal
        - Exercise Imaging Study
          - Reversible Ischemia
            - Strenuous Leisure Activity or Occupation
          - No Reversible Ischemia
        - Medical Treatment
      - Mildly Abnormal
      - Negative
    - Symptom-Limited Exercise Test at 3-6 Weeks
      - Markedly Abnormal
        - Exercise Imaging Study
          - Reversible Ischemia
            - Medical Treatment
          - No Reversible Ischemia
        - Medical Treatment
      - Mildly Abnormal
      - Negative
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

**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 prevent a future attack and may help to extend my life
- Aspirin: 81 mg qd indefinitely
- Beta-blocker
- Sublingual NTG
- 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 future heart attack and that smoking causes other illness which can shorten my life
- Yes
- No
I smoke and have been counseled to stop
I do not smoke
Sample Patient Education Form

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
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 instruction for the next 4-6 weeks, before I start cardiac rehabilitation, or 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
instruction on my discharge medications

_________________________________________
Patient Signature Date

_________________________________________
Nurse Signature Date