Overview of the nonacute management of unstable angina and non-ST-elevation myocardial infarction

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INTRODUCTION

Once the diagnosis of unstable angina or an acute non-ST-elevation myocardial infarction (NSTEMI) is made, the early management of the patient involves the simultaneous achievement of several goals, including relief of ischemic pain, assessment of the hemodynamic state and correction of abnormalities that are present, determining the optimal timing of cardiac catheterization and potential percutaneous coronary intervention, and initiation of antithrombotic therapy. (See "Initial evaluation and management of suspected acute coronary syndrome (myocardial infarction, unstable angina) in the emergency department" and "Overview of the acute management of non-ST-elevation acute coronary syndromes".)

These early diagnostic and therapeutic interventions are followed by the initiation of short- and long-term interventions aimed at improving in-hospital and long-term outcomes. This topic will summarize the management of patients with unstable angina or acute NSTEMI in the hours and days following reperfusion. The reader will be directed to a more detailed discussion of these issues in other topics.

The management of the patient with a STEMI or with a complication of an acute MI (eg, cardiogenic shock, mitral regurgitation, ventricular septal defect) is discussed separately. (See "Overview of the acute management of ST-elevation myocardial infarction" and "Prognosis and

treatment of cardiogenic shock complicating acute myocardial infarction" and "Acute myocardial infarction: Mechanical complications".)

INPATIENT MEDICAL THERAPY

Following initial therapy as discussed above, further medical therapy includes oral beta blockers (if not already given), statins, and possibly nitrates, aldosterone antagonists, and angiotensin converting enzyme (ACE) inhibitors. There is only a limited role for calcium channel blockers and oral anticoagulation, and no role for hormone replacement therapy in postmenopausal women.

Oral beta blockers — Patients who did not receive a beta blocker during the first 24 hours because of early contraindications should be reevaluated for beta blocker candidacy. An oral cardioselective beta blocker, such as metoprolol (25 to 50 mg two to four times daily with the short-acting preparation or 25 to 200 mg daily with the long-acting XL preparation) or atenolol (50 to 100 mg daily), may be used if most concerns about potential adverse effects are no longer present [1]. Less potent initial beta blockade, such as with metoprolol tartrate 12.5 mg twice or four times daily, atenolol 12.5 mg once daily, or carvedilol 3.125 to 6.25 mg twice daily, may be considered for patients in whom concerns regarding adverse effects such as hypotension or heart failure remain.

The optimal duration of beta blocker therapy after MI is not known. We believe the evidence supports the use of beta blockers in patients with MI for as long as three years. The evidence supporting a longer duration, or indefinite therapy, is limited. The efficacy of beta blocker therapy is related in part to the degree of heart rate slowing. These issues are discussed in detail separately. (See "Acute myocardial infarction: Role of beta blocker therapy".)

Nitrates — Nitrates can be useful during the first 24 to 48 hours in patients with recurrent ischemia, hypertension, or heart failure. (See "Nitrates in the management of acute coronary syndrome".)

Phosphodiesterase-5 inhibitors — The phosphodiesterase-5 inhibitors (sildenafil, vardenafil, and tadalafil) are contraindicated in patients taking nitrates because of the potential for exaggerated vasodilation and hypotension and an increased risk of MI or death. (See "Sexual activity in patients with cardiovascular disease".)

Statin therapy — Statin therapy should be instituted prior to hospital discharge, with some data supporting initiation at the time of diagnosis [1]. (See "Overview of the acute management of non-ST-elevation acute coronary syndromes", section on 'Statin therapy'.)

Calcium channel blockers — Calcium channel blockers are used as adjunctive therapy in patients with ongoing or recurrent symptoms of ischemia despite optimal therapy with beta blockers (with or without nitrates), in patients who are unable to tolerate adequate doses of one or both of these agents, or in patients with rapid atrial fibrillation when beta blockers are contraindicated [1].

There are conflicting data from controlled trials as to whether calcium channel blockers do or do not reduce mortality in patients with NSTEMI [2-4]. With respect to unstable angina, a meta-analysis of calcium channel blocker trials found no difference in the incidence of subsequent MI (19.6 versus 19.0 percent for placebo) or death (2.4 versus 1.6 percent for placebo) [5].

The second generation dihydropyridine calcium channel blockers amlodipine and felodipine appear to be safe in other forms of cardiovascular disease. Extrapolation from the results of these trials does not necessarily confirm that amlodipine or felodipine are safe in patients with an acute MI. Nonetheless, these agents, especially amlodipine, are often used in patients with an acute MI when hypertension is not adequately controlled by other therapy of proven benefit (beta blockers and ACE inhibitors).

Immediate release nifedipine is contraindicated because of the reflex sympathetic activation, tachycardia, and hypotension associated with its use. (See "Major side effects and safety of calcium channel blockers", section on 'Possible increased mortality after acute myocardial infarction'.)

These agents should be continued after discharge in those patients who require them for antiischemic or antihypertensive therapy as well as for rate control of atrial tachyarrhythmias.

Red cell transfusion — As in the acute setting, red blood cell transfusion is generally reserved for severe or symptomatic anemia, such as hemoglobin <8 g/dL or hemoglobin 8 to 10 g/dL with hemodynamic instability or ongoing ischemia. Clinical judgment is required to determine if transfusion is likely to improve oxygen delivery or if there are other reasons to consider transfusion such as active bleeding or trauma. In deciding when to transfuse, individual patient characteristics such as the rate of blood loss and severity of myocardial ischemia need to be taken into account.

The rationale for using a restrictive transfusion strategy (limiting transfusions, transfusing for a lower rather than a higher hemoglobin level) includes avoiding risks of transfusion reactions or transfusion-transmitted infection and limiting burdens and costs while using evidence-based thresholds for optimal outcomes. While anemia correlates with worse outcomes, this is likely to be an association rather than causation. (See "Indications and hemoglobin thresholds for RBC transfusion in adults", section on 'Overview of our approach'.)

Supporting data for the thresholds used in unstable angina or NSTEMI are presented separately. (See "Indications and hemoglobin thresholds for RBC transfusion in adults", section on 'Acute MI'.)

Antiarrhythmic drugs — The management of atrial and ventricular arrhythmias is discussed separately. (See "Overview of the acute management of non-ST-elevation acute coronary syndromes", section on 'Arrhythmia prevention and management'.)

Venous thromboembolism prophylaxis — Prophylaxis for venous thromboembolism should be considered in patients who are immobilized. (See "Prevention of venous thromboembolic disease in acutely ill hospitalized medical adults".)

In patients with uncomplicated NSTEMI who will be at bed rest for less than 24 hours, venous thromboembolism prophylaxis is not necessary (unless indicated for some other reason). For NSTEMI patients in whom bed rest is anticipated for more than 24 hours and for whom anticoagulation is no longer required as part of the management of their ACS, we suggest low-dose UFH (5000 units, two or three times daily depending on patient risk level), LMWH (eg, enoxaparin 40 mg/day) or fondaparinux 2.5 mg/day, all given subcutaneously, until the patient is ambulatory.

Gastrointestinal prophylaxis — Patients with ACS who develop gastrointestinal bleeding after PCI have significantly worse outcomes. The discussion of the long-term primary prevention of gastrointestinal bleeding is found elsewhere. (See "Gastrointestinal bleeding in patients undergoing percutaneous coronary intervention", section on 'Outcomes'.)

RECURRENT CHEST PAIN

Chest pain after NSTEMI may occur and it is important to determine whether this is representative of recurrent ischemia/infarction or simply resolving discomfort after the initial event. Diagnosing recurrent ischemia/infarction can sometimes be difficult but the presence of typical anginal pain, ischemic ST-segment shifts on the electrocardiogram (ECG), or a typical rise and fall in cardiac biomarkers are useful distinguishing features. Coronary angiography is sometimes necessary to evaluate recurrent chest pain. Chest pain after coronary intervention is also common and can be sorted out in a similar fashion. In particular, the lack of ST-segment shifts on the ECG following coronary intervention is often a useful discriminating feature.

Recurrent ischemia and reinfarction — Among patients with an NSTEMI who have undergone apparently successful percutaneous coronary intervention (PCI), recurrent ischemia or reinfarction represents either ischemia in a coronary distribution not revascularized or possible

stent thrombosis. Recurrent ischemia is often manifest by the recurrence of symptoms and new or changing ECG abnormalities.

Management — Initial medical management of recurrent ischemia should include escalation of therapy with beta blockers and nitrates to decrease myocardial oxygen demand and reduce ischemia. Early PCI is considered for these patients, particularly if electrocardiographic evidence of ischemia is present. Intravenous anticoagulation should be initiated if it is not already being administered. For patients with hemodynamic instability, poor left ventricular function, or a large area of myocardium at risk, insertion of an intraaortic balloon pump should also be considered.

PCI is the treatment of choice for patients with recurrent ischemia, unless the patient's coronary anatomy or clinical status preclude coronary intervention.

Infarction pericarditis — Acute pericarditis, generally defined as a pericardial friction rub with or without chest discomfort, may rarely complicate the course of an acute NSTEMI. Chest pain is typically pleuritic. Pain in one or both trapezius ridges is especially consistent with the diagnosis. The evaluation and management of this complication are discussed separately. (See "Pericardial complications of myocardial infarction", section on 'Peri-infarction pericarditis'.)

A somewhat separate issue, chest pain or silent ischemia on stress testing before or soon after discharge, is discussed below. (See 'Stress testing' below.)

PREPARING FOR DISCHARGE

The optimal duration of hospitalization for patients with non-ST-elevation acute coronary syndrome (NSTEACS) who have been revascularized with percutaneous coronary intervention (PCI) has not been defined. The employment of early angiography and revascularization has led to shorter hospitalizations for patients and the use of stenting and potent antiplatelet therapy in the periprocedural period has led to a reduction in recurrent ischemic events. On the other hand, potent antiplatelet and antithrombotic therapies are associated with an increased risk of major bleeding, which may complicate and lengthen hospitalization.

Prior to discharge, the patient should undergo risk stratification. Other components of predischarge planning include counseling about changes in lifestyle and appropriate medical therapy to reduce the risk for further ischemic episodes.

Ambulation — The first major step in the transition from acute care to hospital discharge in patients with NSTEACS is ambulation. The proper timing of ambulation is patient and institution

dependent and requires balancing the risk of bleeding after coronary intervention with the deleterious effects of deconditioning that can be induced by prolonged bed rest. We suggest the following approach:

- Among patients who have undergone percutaneous revascularization, progressive ambulation can be started after the time required to achieve adequate hemostasis (often three to six hours) in patients who are hemodynamically stable and not having ongoing ischemic symptoms. For patients who have undergone radial (rather than femoral) catheterization, ambulation may be started earlier.

- Among patients who have not undergone revascularization, progressive ambulation can be started when the patient is hemodynamically stable without attendant complications for three to six hours after the peak of the cardiac marker rise.

Chronic anticoagulation — The role of anticoagulation in patients with recent ACS is discussed separately. (See "Acute coronary syndrome: Oral anticoagulation in medically treated patients".)

The use of chronic anticoagulation with dual antiplatelet therapy is discussed elsewhere. (See "Coronary artery disease patients requiring combined anticoagulant and antiplatelet therapy".)

Long-term risk stratification — Patients with an NSTEACS should undergo further risk assessment prior to discharge. This issue is discussed in detail separately. (See "Risk stratification after non-ST elevation acute coronary syndrome".)

Stress testing — Predischarge stress testing to detect residual ischemia is generally **not** performed in patients who have undergone PCI or coronary artery bypass graft surgery and have been **fully** revascularized (eg, single vessel disease and successful PCI). Such patients often undergo exercise testing a few weeks or more after discharge as part of a cardiac rehabilitation program or for activity counseling.

In contrast, patients who have undergone partial revascularization or no revascularization are candidates for predischarge low level stress testing, usually with exercise. (See "Risk stratification after non-ST elevation acute coronary syndrome", section on 'Stress testing'.)

For patients with symptomatic ischemia on post-infarct stress testing, we suggest the following approach:

- Coronary angiography followed by revascularization if appropriate is performed in patients with noninvasive evidence suggesting a moderate to large amount of myocardium at risk. Examples include ischemia during stage I or II of the Bruce protocol, a hypotensive blood pressure response or symptoms of pulmonary congestion, more than 2

mm of ST segment depression, or imaging studies suggesting involvement of either a large portion of the anterior wall or showing multiple areas of ischemia.

- Patients with only mild ischemia can be continued on medical therapy alone, but patient preference may be important.

The management of silent ischemia detected on stress testing is similar and discussed separately. (See "Silent myocardial ischemia: Epidemiology, diagnosis, treatment, and prognosis", section on 'Revascularization'.)

Evaluation of LV function — Assessment of resting left ventricular function is an important part of risk stratification in patients with an NSTEACS [1]. Patients with left ventricular systolic dysfunction have increased mortality at long-term follow-up and more than a 50 percent probability of having multivessel coronary disease [6].

In the absence of a specific indication (eg, heart failure or suspected mechanical complication), the left ventricular ejection fraction (LVEF) is usually measured before discharge.

Multiple imaging techniques for assessing left ventricular function are available and each has equivalent prognostic value in the post-MI patient. In general, echocardiography should be used for routine assessment of LVEF after an NSTEACS. (See "Role of echocardiography in acute myocardial infarction".)

Pharmacologic therapy — In most cases, the inpatient antiischemic medical regimen used during hospitalization (other than intravenous nitroglycerin) should be continued after discharge and the antiplatelet/anticoagulant medications should be changed to an outpatient regimen. The goals for continued medical therapy after discharge relate to potential prognostic benefits; treatment of major risk factors such as hypertension, smoking, hyperlipidemia, and diabetes mellitus; and control of ischemic symptoms if they recur.

Appropriate use of antiplatelet agents, beta blockers, lipid-lowering drugs, and, in selected patients, angiotensin converting enzyme (ACE) inhibitors may reduce six-month mortality by as much as 90 percent compared with patients who receive no appropriate therapy [7]. (See "Prevention of cardiovascular disease events in those with established disease (secondary prevention) or at very high risk".)

Antiplatelet therapy — In the absence of an absolute contraindication, aspirin is recommended indefinitely in all patients who have had an ACS. (See "Aspirin for the secondary prevention of atherosclerotic cardiovascular disease".)

$P2Y_{12}$ receptor blocker therapy is indicated in all patients after NSTEMI for at least one month and up to a year, irrespective of whether revascularization or stenting occurs. The specific recommendations for the duration of therapy after MI or stent placement are found elsewhere. (See "Acute non-ST-elevation acute coronary syndromes: Early antiplatelet therapy" and "Long-term antiplatelet therapy after coronary artery stenting in stable patients", section on 'Summary and recommendations'.)

Nitrates — Long-term nitrate therapy is useful for the treatment of recurrent ischemia or (on occasion) heart failure as long as it does not preclude adequate therapy with agents proven to reduce mortality, such as beta blockers or ACE inhibitors. (See "Nitrates in the management of chronic coronary syndrome", section on 'Nitrate tolerance'.)

ACE inhibitors — ACE inhibitors lead to improved 30-day mortality after acute STEMI, particularly in patients with an anterior infarct or reduced left ventricular function. There is less information concerning efficacy in NSTEMI [8,9] and even less in unstable angina [10]. They are also of long-term benefit in MI patients with hypertension, diabetes, or stable chronic kidney disease [1]. (See "Angiotensin converting enzyme inhibitors and receptor blockers in acute myocardial infarction: Clinical trials".)

Based on the evidence, we treat all patients with NSTEACS with ACE inhibitors. We start ACE inhibitors in hemodynamically stable patients with NSTEMI prior to hospital discharge.

Caution is required to avoid causing hypotension in the first few hours after the infarction. Concern about concurrent aspirin therapy attenuating the effect of an ACE inhibitor appears largely unwarranted [11]. (See "Angiotensin converting enzyme inhibitors and receptor blockers in acute myocardial infarction: Recommendations for use", section on 'Aspirin and angiotensin inhibition'.)

Angiotensin II receptor blockers — An angiotensin II receptor blocker (ARB) is an alternative for patients unable to tolerate an ACE inhibitor (usually due to cough). (See "Angiotensin converting enzyme inhibitors and receptor blockers in acute myocardial infarction: Clinical trials", section on 'Comparison to ACE inhibitor'.)

An ARB in addition to an ACE inhibitor in the immediate post-MI setting has not been shown to lead to clear benefit [12]. (See "Angiotensin converting enzyme inhibitors and receptor blockers in acute myocardial infarction: Clinical trials", section on 'Combination with ACE inhibitor'.)

Mineralocorticoid receptor antagonists — We recommend an aldosterone antagonist, also referred to as an aldosterone receptor antagonist or a mineralocorticoid receptor antagonist, to all NSTEMI patients who are receiving a therapeutic dose of an ACE inhibitor, have an LVEF ≤40

percent, have heart failure or diabetes mellitus, and are free of significant renal dysfunction or hyperkalemia [1].

Therapy should be begun before discharge, since a mortality benefit is seen within 30 days [13]. The details on aldosterone antagonist use in patients with reduced ejection fraction are discussed separately. (See "Primary pharmacologic therapy for heart failure with reduced ejection fraction", section on 'Primary components of therapy' and "Treatment and prognosis of heart failure with mildly reduced ejection fraction", section on 'Combination therapy'.)

The use of these agents in MI patients with no heart failure or with an EF above 40 percent has not been shown to improve clinical outcomes [14].

All ACS patients should be given a prescription for sublingual or spray nitroglycerin and instructed in its use prior to discharge.

Therapies of unclear benefit — Therapies of unclear benefit include colchicine and stem cell therapies and are discussed separately. (See "Overview of the nonacute management of ST-elevation myocardial infarction", section on 'Therapies of unclear benefit'.)

Vaccination — We recommend influenza and pneumococcal vaccination as part of a comprehensive secondary prevention program in adults with coronary and other atherosclerotic vascular diseases. If indicated, we suggest vaccination for these during hospitalization for an ACS. (See "Pneumococcal vaccination in adults" and "Seasonal influenza vaccination in adults".)

Ventricular arrhythmias — The role of implantable cardioverter defibrillators after MI is discussed separately. (See "Primary prevention of sudden cardiac death in patients with cardiomyopathy and heart failure with reduced LVEF".)

The management of late arrhythmias is discussed separately. (See "Ventricular arrhythmias during acute myocardial infarction: Incidence, mechanisms, and clinical features", section on 'Late arrhythmias'.)

Return to activities — Patients should be counseled about return to prior activities before discharge. The majority of patients who remain asymptomatic can probably return to prior nonphysical activities, including work, safely within two weeks, although few data are available.

- Daily physical activity, such as walking, should be encouraged; the intensity of physical activity can be increased according to the cardiac rehabilitation plan. (See "Cardiac rehabilitation programs".)

- When sexual activity can be safely resumed is dependent upon a number of factors, including whether or not the patient has been revascularized and, if not, if there is ischemia on stress testing (table 1).

  An important caveat is that phosphodiesterase-5 inhibitors (sildenafil, vardenafil, and tadalafil) cannot be taken within 24 to 48 hours of a nitrate. These issues are discussed in detail separately. (See "Sexual activity in patients with cardiovascular disease".)

- Driving can begin a week after discharge if the patient is judged to be in compliance with individual state laws

- Since commercial aircrafts are pressurized to 7500 to 8000 feet, air travel should be undertaken only by stable patients (without a fear of flying) within the first two weeks and then only as long as they travel with companions, carry sublingual nitroglycerin, and request airport transportation to avoid rushing. (See "Approach to patients with heart disease who wish to travel by air or to high altitude", section on 'Air travel'.)

For patients with a more complicated course, return to usual activities should be delayed by two to three weeks.

Appropriate medical therapy can reduce the risk of subsequent ischemic events and mortality in patients who have had an acute MI. In addition to the interventions discussed in this section, beta blockers, statins, nitrates, and calcium channel blockers may be useful long term and are discussed above. (See 'Inpatient medical therapy' above.)

RISK FACTOR MODIFICATION

Risk factor modification using behavioral/lifestyle changes such as dietary modification, increase in activity level, and smoking cessation are associated with better outcomes after acute coronary syndromes (ACS). Patient education should be given at the time of discharge and referral to a cardiac rehabilitation program should be made. (See "Prevention of cardiovascular disease events in those with established disease (secondary prevention) or at very high risk", section on 'Lifestyle modifications' and 'Cardiac rehabilitation' below.)

Hypertension — Hypertension should be treated in patients who have had a non-ST-elevation ACS. The optimal goal blood pressure and choice of antihypertensive drugs in such patients are discussed in detail separately. (See "Choice of drug therapy in primary (essential) hypertension" and "Goal blood pressure in adults with hypertension".)

Glycemic control — The long-term management of diabetes in patients with cardiovascular disease is discussed elsewhere. (See "Thiazolidinediones in the treatment of type 2 diabetes mellitus", section on 'Cardiovascular effects' and "Glycemic control and vascular complications in type 2 diabetes mellitus".)

Smoking cessation — Smoking cessation reduces the risk of recurrent coronary events. We recommend education about smoking cessation during hospitalization and referral to a smoking cessation program or outpatient cardiac rehabilitation program where nicotine replacement therapy and bupropion are available [1]. (See "Cardiovascular risk of smoking and benefits of smoking cessation" and "Pharmacotherapy for smoking cessation in adults", section on 'Nicotine replacement therapy'.)

However, the issue of whether nicotine replacement can be started during hospitalization has not been well studied and there is some evidence of lack of harm with transdermal nicotine replacement [15]. We suggest that cautious initiation of nicotine replacement can be considered during hospitalization for those patients with ACS in whom the benefits appear to outweigh the risks.

Diet — Good dietary habits and use of a prudent diet can reduce the risk of coronary heart disease. (See "Healthy diet in adults".)

Exercise — An increase in activity level in patients with established cardiovascular disease is associated with better outcomes. This topic is discussed in detail separately. (See "Exercise and fitness in the prevention of atherosclerotic cardiovascular disease", section on 'Secondary prevention'.)

Stress management — Psychosocial stress factors are associated with a poor long-term prognosis, and reducing emotional stress may improve outcomes. (See "Psychosocial factors in acute coronary syndrome".)

Cardiac rehabilitation — Multifactorial cardiac rehabilitation can produce significant long-term reductions in both total and cardiovascular mortality. (See "Cardiac rehabilitation: Indications, efficacy, and safety in patients with coronary heart disease".)

PROGNOSIS

Patients presenting with an NSTEMI have a lower in-hospital mortality than those with a STEMI, but a similar or perhaps worse long-term outcome. This topic is discussed in detail separately. (See "Prognosis after myocardial infarction".)

RECOMMENDATIONS OF OTHERS

Societal guidelines for the management of patients with acute non-ST-elevation ACS are available from:

- European Society of Cardiology (2015) [16]
- American College of Cardiology/American Heart Association (2014) [1]

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Non-ST-elevation acute coronary syndromes (non-ST-elevation myocardial infarction)".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

- Basics topics (see "Patient education: Heart attack (The Basics)" and "Patient education: Heart attack recovery (The Basics)" and "Patient education: Coping with high drug prices (The Basics)")

- Beyond the Basics topics (see "Patient education: Heart attack (Beyond the Basics)" and "Patient education: Heart attack recovery (Beyond the Basics)" and "Patient education: Coping with high prescription drug prices in the United States (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- **Therapy following initial medical therapy and percutaneous coronary intervention** – This topic briefly discusses the management of patients with unstable angina or acute non-ST-elevation myocardial infarction (NSTEMI) in the hours and days following reperfusion and refers the reader to more detailed discussions of these issues in other topics. (See 'Introduction' above.)

- **Medical therapy prior to discharge** – The following interventions are beneficial in the majority of patients with NSTEMI or unstable angina who have undergone early interventions:

  - Beta blockers. (See 'Oral beta blockers' above.)

  - Statins. (See 'Statin therapy' above.)

  - Aggressive management of recurrent myocardial ischemia or reinfarction. (See 'Recurrent chest pain' above.)

  - Aspirin and $P2Y_{12}$ receptor blocker therapy is indicated in all patients after NSTEMI for at least one month and up to a year, irrespective of whether revascularization or stenting occurs. (See 'Antiplatelet therapy' above.)

  - Angiotensin converting enzyme inhibitors in most patients. (See 'ACE inhibitors' above and 'Angiotensin II receptor blockers' above.)

- **Risk factor modification** – The major modifiable risk factors for coronary artery disease (smoking, hypertension, diabetes, and dyslipidemia) need to be evaluated and corrected as necessary. A long-term plan for their control needs to be discussed with the patient; referral to an outpatient cardiac rehabilitation program is useful for this purpose. (See 'Risk factor modification' above.)

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GRAPHICS

Second Princeton consensus panel recommendations for risk assignment for sexual activity and management of sexual dysfunction

Grade of risk	Criteria
CAVEATS	Phosphodiesterase-5 inhibitors contraindicated with any nitrate preparation should not be taken with alpha-blocking agents
	Nitrates should not be administered within 24 hours (or longer in patients with renal or hepatic dysfunction) of sildenafil, 24 hours of vardenafil, or up to 48 hours of tadalafil
Low risk	No symptoms and less than three major cardiovascular risk factors (excluding gender)
	Controlled hypertension
	Mild, stable angina
	Post-successful coronary revascularization
	Uncomplicated MI more than six to eight weeks previously in patients who do not have exercise-induced ischemia or who have undergone coronary revascularization
	Mild valvular disease
	Asymptomatic LV dysfunction
	Management
	Patients at low risk can safely initiate or resume sexual activity and can be treated for sexual dysfunction
Intermediate or indeterminate risk	No symptoms and three or more major cardiovascular risk factors (excluding gender)
	Moderate, stable angina
	Recent MI (more than two but less than six weeks previously); in patients who have not undergone revascularization, the risk can be assessed with stress testing
	Asymptomatic LV dysfunction with LV ejection fraction <40 percent or NYHA class II heart failure
	Noncardiac sequelae of atherosclerotic disease, such as peripheral vascular disease or prior stroke or transient ischemic attack
	Management
	Patients at intermediate or indeterminate risk should undergo further cardiologic evaluation, such as stress testing (particularly in patients with a

	sedentary lifestyle), in an attempt to restratify the patient into the high risk or low risk category
High risk	Unstable or refractory angina
	Uncontrolled hypertension
	NYHA class III/IV heart failure
	MI within the past two weeks
	High-risk arrhythmias
	Obstructive hypertrophic cardiomyopathy
	Moderate to severe valvular disease, particular aortic stenosis
	Management
	Patients at high risk should be stabilized by appropriate therapy before resuming sexual activity

MI: myocardial infarction; LV: left ventricular; NYHA: New York Heart Association.

Adapted from Kostis B, Jackson G, Rosen R, et al. Am J Cardiol 2005; 96:313.

Graphic 71511 Version 4.0