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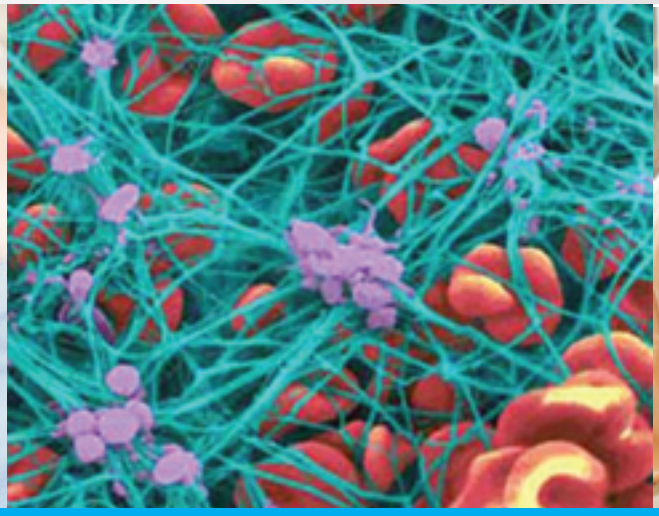
THE Clinical Advisor

Case Study 3
Secondary Prevention for Post-ACS Patients



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NEEDS ASSESSMENT

Each year, more than 2 million patients in the United States suffer from acute coronary syndrome (ACS).[1] The national Institute of Medicine has identified the prevention and reduction of recurring ischemic events and optimization of individual functioning as key elements of quality improvement.[2] One such area for exploration and improvement is the selection and continuation of antiplatelet therapy to prevent thrombotic events after percutaneous coronary intervention (PCI). In patients with ACS, intracoronary stenting can improve the success of PCI and reduce restenosis compared with balloon angioplasty, but it can also increase the rate of thrombotic complications, including stent thrombosis. The current standard of care following PCI is dual antiplatelet therapy with the thienopyridine clopidogrel plus aspirin.[3] Adding a thienopyridine has been shown to dramatically reduce early major cardiac events following stent placement versus either aspirin alone or aspirin combined with warfarin.[4]

The most recent guidelines on PCI developed by the American College of Cardiology, American Heart Association, and Society for Cardiovascular Angiography and Interventions state that, ideally, dual antiplatelet therapy should continue for 1 year following PCI, with a minimum of 1 month of therapy after placement of bare metal stents, 3 months for sirolimus drug-eluting stents (DES), and 6 months for paclitaxel DES.[4] Those established minimums, however, are based on the use of DES on low-risk heart lesions in relatively low-risk patients. Stents are now being used in high-risk lesions in high-risk patients, emphasizing the need to continue therapy beyond the minimum time periods recommended. A recent advisory cautioned against premature discontinuation of thienopyridine therapy—a practice that occurs despite current recommendations to continue dual antiplatelet therapy for at least 1 month after placement of a bare metal stent or up to 12 months after placement of a DES.[5]

There are important clinical concerns with the use of thienopyridines, including the loading time and loading dose needed to achieve and sustain effective levels of antiplatelet activity,[6] and the development of drug "resistance," wherein up to one third of patients treated with the thienopyridine clopidogrel have an inadequate or absent platelet response to treatment.[7] As a result, selection of antiplatelet agents, appropriate dosing, and optimum duration of therapy are all crucial in high-risk patients, and improvements in antiplatelet therapy continue to be the focus of research and development.

With the advent of a number of new antiplatelet therapies and conflicting reports in the scientific literature regarding their efficacy and safety, NPs and RNs need to know if and how the treatment guidelines will change, specifically:

- which patients should receive antiplatelet therapy;
- the ideal timing and duration of therapy;
- how best to promote compliance with treatment regimens;
- how early therapy can be discontinued; and
- which, if any, medications lead to better patient outcomes.

Health-care professionals, particularly RNs and NPs, play a key role in preventing catastrophic ischemic events by recognizing patients at increased risk for stent thrombosis, providing appropriate treatment and prevention plans, and ensuring that they are compliant with antiplatelet therapy for at least 1 year after stent placement. The familiarity of RNs and NPs with their patients, as well as current evidence-guided management recommendations, can improve clinical outcomes for patients with ACS, emphasizing the importance of up-to-date education for RNs and NPs, both during and following an acute ischemic event.[8]

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TARGET AUDIENCE

Nurse practitioners and RNs working in cardiovascular care

LEARNING OBJECTIVES

After taking part in this activity, participants should be better able to:

- Explain current approaches to antiplatelet therapy for patients with acute coronary syndrome, particularly those undergoing percutaneous coronary intervention (PCI).
- Summarize the latest American College of Cardiology/American Heart Association/Society for Cardiovascular Angiography and Interventions guidelines on the continuation of antiplatelet therapy following PCI.
- Educate patients on the importance of antiplatelet therapy, discuss the morbidity and mortality risks and costs of premature discontinuation of antiplatelet therapy, and devise methods to ensure compliance with treatment.
- Outline the benefits and limitations of current approaches to antiplatelet therapy, focusing on the post-PCI period, and describe patient risk factors associated with late in-stent thrombosis.

ACCREDITATION STATEMENT

Montefiore Medical Center, Division of Education & Organizational Development, is an approved provider of continuing nursing education by the New York State Nurses Association, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

It has been assigned Provider Code 6T5LUE-PRV-172.

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Case Study 3: Secondary Prevention for Post-ACS Patients

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Welcome to the third installment of a three-part case study series on acute coronary syndrome (ACS). This series is one segment of an ongoing educational initiative that began with the monograph *Nursing Challenges in the Management of Acute Coronary Syndrome: A Clinical Curriculum on Antiplatelet Therapies.* Reading the monograph is not a prerequisite to participating in this activity.

After the brief case presentation, you'll be asked to answer 5 multiple-choice questions. They are intended to add interactivity to this educational activity, providing an opportunity to practice decision-making with a virtual patient. Each of the possible answers comes with an explanation of why it does or does not represent the best course of action for the situation described.

Please note: Montefiore Medical Center, Division of Education & Organizational Development has included generic and brand names of all therapeutic agents mentioned in this educational offering. This information is not intended to promote any particular drugs or drug classes.

Drugs Mentioned in This Study	
Generic Name	**Brand Name**
ACE inhibitors Beta-blocker Metoprolol	 Lopressor
Glycoprotein (GP) IIb/IIIa receptor antagonists Abciximab Eptifibatide Tirofiban	 Reopro Integrilin Aggrastat
Renin-angiotensin-aldosterone system blocker Losartan	 Cozaar
Statin Atorvastatin	 Lipitor
Thienopyridine Clopidogrel	 Plavix

CASE PRESENTATION

Each patient with ACS presents with individual medical, psychological, and social needs, all of which must be considered by the patient's healthcare team in formulating an optimal secondary prevention program. Even allowing for these singular requirements, however, there are general recommendations that apply to all post-ACS patients.

DISCUSSION

The aim of secondary prevention is to treat and to rehabilitate ACS patients to prevent another cardiovascular incident. Secondary prevention includes pharmacologic and nonpharmacologic measures as well as the education of patients to understand and to adhere to their therapeutic regimens. The hospital discharge process is an opportunity to discuss lifestyle and risk-factor modification, such as exercise, rehabilitation, and smoking cessation.[1] By following the goals of secondary prevention, the patient will likely improve his or her quality of life, morbidity, and mortality; and reduce the possibility of experiencing interventional procedures.

Pharmacology

Medications for secondary prevention depend on the treatment received by UA/NSTEMI patients—bare-metal stents, drug-eluting stents, or no stents.[2] Medications for STEMI patients depend, also, on the specific procedure.[3] Even with these caveats, however, clopidogrel and aspirin are the mainstays of pharmacologic treatment.[2,3] The patient's concomitant conditions will guide the use of renin-angiotensin-aldosterone system blockers, and beta-blockers, ACE inhibitors, statins, aspirin, and clopidogrel.

The importance of pharmacologic recommendations in ACS patients is illustrated in a 2007 science advisory[4] issued by multiple organizations that emphasizes the need for 12 months of dual antiplatelet therapy after placement of a drug-

eluting stent. Also stressed is the education of patients and healthcare providers about potential damage that can result from premature discontinuation of dual antiplatelet therapy.[4] Indeed, if patients seem unlikely to comply with 1 year of thienopyridine therapy, an option other than a drug-eluting stent should be considered.[4]

An analysis from the PREMIER registry identified 12 factors that were associated with premature discontinuation of thienopyridine therapy.[5] These included older age, not having completed high school, not being married, not receiving discharge instructions for medication use, not being referred for cardiac rehabilitation, greater likelihood of having preexistent cardiovascular disease or anemia, and not seeking healthcare because of cost.[5] In another study, Kulkarni and colleagues examined 1-year adherence with cardiovascular drugs—ACE inhibitors, aspirin, beta-blockers, and statins—in 1,326 patients (mean age, 65.7 years; 36% were women) undergoing cardiac catheterization.[6] At discharge, aspirin was prescribed in 95%, beta-blockers in 86%, ACE inhibitors in 65%, and statins in 55%. At 1 year, only 54% were adherent to all initial medications. Patients who discontinued their medications were more likely to be older, women, unmarried, and less educated. The more prescribed medications the study patients took, the lower their adherence to the recommended regimen. Insurance coverage and physical function did not correlate with adherence.

Clearly, nonadherence is a critical issue for patients and healthcare providers. Whether it is primary nonadherence, ie, the patient does not fill the prescription, or secondary nonadherence, ie, the patient does not follow instructions or refill a prescription, educating patients about starting and maintaining their regimens is essential to their good health.[7] For example, despite the correlation between use of statins and survival rates, 2-year adherence rates in one study were 40% for ACS, 36% for chronic coronary artery disease, and 25% for chronic prevention.[7]

Women benefit just as much as men do from treatment with aspirin, clopidogrel, anticoagulants, beta-blockers, ACE inhibitors, and statins, but they do not receive aspirin and other anticoagulants as often.[2]

Because older age (older than 75 years) is associated with increased disease severity and a higher probability of complications from treatment, this population's medications and concomitant conditions should be reviewed carefully before starting secondary prevention measures.[2]

ADDITIONAL COMPONENTS OF SECONDARY PREVENTION

The guidelines for NSTEMI and STEMI make similar recommendations for cardiac rehabilitation, smoking, blood pressure control, lipid management, physical activity, diabetes management, weight management, and influenza vaccination.

Comprehensive cardiac rehabilitation includes exercise in addition to risk-factor assessment, education, and modification.[2] Cardiac rehabilitation improves exercise tolerance without complicating cardiovascular conditions, alleviates cardiovascular symptoms, and improves lipid levels.[2] In conjunction with a smoking cessation program, cardiac rehab also reduces cigarette smoking. The advantages of rehabilitation after uncomplicated UA/NSTEMI with revascularization and pharmacotherapy are not so obvious in comparison with patients who have STEMI or complicated NSTEMI.[2]

Smoking cessation should be encouraged and discussed at every healthcare visit. Follow-up should include a referral to smoking cessation programs or pharmacotherapy.[3]

Blood pressure control for all UA/NSTEMI patients should target the normal range, ie, less than 130/80 mm Hg if the patient has diabetes or chronic kidney disease.[2] In STEMI patients whose blood pressure is 120/80 mm Hg or higher, lifestyle modification, ie, weight control, physical activity, alcohol moderation, moderate sodium intake, and emphasis on fruits, vegetables, and low-fat dairy products, should be started.[3] If blood pressure is 140/90 mm Hg or higher, or 130/80 mm Hg or higher for individuals with chronic kidney disease or diabetes, blood pressure–reducing medications, starting with beta-blockers and inhibitors of the reninangiotensin-aldosterone system, should be added.[3]

Statins have proved to be of considerable value to UA/NSTEMI patients regardless of baseline LDL-C levels.[2] More aggressive lipid-lowering has been proven to further reduce cardiovascular-event rates and is safe. The incremental impact, however, on mortality over moderate lipid-lowering is not definitive.[2] Both UA/NSTEMI and STEMI guidelines recommend initiating lipid-lowering treatment and dietary modifications before the patient is discharged. [2,3]

Physical activity is essential to the well-being of UA/NSTEMI patients.[2] Exercise training can usually begin within 1 to 2 weeks after revascularization. Activity questionnaires have been created for cardiac patients to direct exercise regimens.[2] Mild-to-moderate resistance training may begin 2 to 4 weeks after aerobic training has been started.[2] The goal of physical activity is 30 minutes, 7 days per week.[3] All patients should un-

Table: Patient Health Questionnaire: 2 Items*

Over the past 2 weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things.
2. Feeling down, depressed, or hopeless.

*If the answer is "yes" to either question, then refer for more comprehensive clinical evaluation by a professional qualified in the diagnosis and management of depression or screen with PHQ-9.

Source: Lichtman JH, Bigger JT Jr, Blumenthal JA, et al. Depression and coronary heart disease: recommendations for screening, referral, and treatment: a science advisory from the Prevention Committee of the American Heart Association Cardiovascular Nursing Council, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Interdisciplinary Council on Quality of Care and Outcomes Research. *Circulation*. 2008;118:1768-1775.

dergo a risk assessment by means of a physical history or an exercise test.[3]

Patients with diabetes and UA/NSTEMI have more severe coronary artery disease, more ulcerated plaques and intracoronary thrombi, more vascular comorbidities, and are more often patients who have had coronary artery bypass grafts.[2] Data on outcomes in UA/NSTEMI patients who have diabetes with the use of drug-eluting stents, GP IIb/IIIa inhibitors, and long-term clopidogrel are limited.[2] For both UA/NSTEMI and STEMI patients with diabetes, the following recommendations apply: lifestyle and pharmacotherapy measures to achieve a near-normal hemoglobin A1C level, eg, less than 7% and energetic modification of other risk factors such as exercise, weight management, blood pressure control, and cholesterol management.[2,3] Coordinating the patient's diabetic care with the patient's primary care physician or endocrinologist is helpful.[2,3]

Weight management is essential for UA/NSTEMI and STEMI patients who are overweight; they should receive instruction about regular exercise and the importance of a diet that will help maintain the appropriate body mass index.[2] Patients are also advised that the initial goal of weight-loss therapy should be to reduce body weight by ~10% from baseline.[3]

Influenza vaccination should be given annually to all ACS patients.[2,3]

OTHER CONCERNS

Depression should be evaluated in ACS patients, given its association with cardiac disease.[8] A 2008 statement from the American Heart Association, which was endorsed by the American Psychiatric Association, recommended screening of cardiac patients at regular intervals for depression.[9] The Patient Health Questionnaire (PHQ-2) offers two questions that are recommended for identifying currently depressed patients (***Table***). If patients respond "yes" to either question, all 9 PHQ items (PHQ-9) should be asked. The PHQ-9, which is a brief depression screening instrument, can be completed by most patients, unaided, in about 5 minutes. The use of the questionnaire results in a provisional depression diagnosis and a severity score that can guide therapy; it has demonstrated reasonable sensitivity and specificity for coronary heart disease patients.[9] (To download the PHQ, go to http://depression-primarycare.org/clinicians/toolkits/materials/forms/phq9/questionnaire_sample.)[9]

Some ACS patients may experience sleep apnea, which has been associated with cardiovascular disease. Obstructive sleep apnea, one form of sleep apnea, is common in the United States—approximately 5% to 15% of the population—and is a risk factor for hypertension and the development of cardiovascular disease.[10,11] Although the precise mechanism linking sleep apnea and cardiovascular disease is unknown, it appears that obstructive sleep apnea is associated with proinflammatory and prothrombotic factors that play a role in the development of atherosclerosis.[10] Studies have implicated obstructive sleep apnea in stroke and transient ischemic attacks.[11] Further, obstructive sleep apnea may be correlated with coronary heart disease, heart failure, and cardiac arrhythmias.[11]

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