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Management of Coronary Artery Disease

- I. Identification of Coronary Artery Disease
 - A. Coronary Artery Disease (CAD) may be manifested in a variety of ways:
 1. asymptomatic,
 2. stable angina,
 3. unstable angina,
 4. acute myocardial infarction (MI)
 5. Sudden Death
 - B. This clinical guideline addresses the evaluation and categorization of CAD as well as the management of stable angina. Unstable angina and MI (Acute coronary Syndrome) require rapid identification and referral for emergency inpatient management. This guideline also addresses the recognition and management of risk factors associated with increased CAD risk or morbidity; including hypertension and hyperlipidemia. The Management of Hypertension guideline is found at MSRM 140137-04. Management of Hyperlipidemia is addressed in this CAD guideline and in the Management of Diabetes guideline, MSRM 140137-02. Patients being followed for the management of Hyperlipidemia are included as part of the Chronic Clinic CAD patient population, with or without documented CAD.

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- C. Angina is a clinical syndrome characterized by discomfort in the chest, jaw, shoulder, back, or arm. It is typically aggravated by exertion or emotional stress and is relieved by rest or nitroglycerin.
- D. The first task in evaluating a patient with chest pain is to assign a classification of high, intermediate, or low probability of CAD. The three strongest predictors of probability of CAD are :
1. Age
 2. Gender
 3. Chest Pain Type

Chest pain type can be categorized into one of three groups:

- a. Typical angina (definite)
 - (1) Substernal crushing or squeezing chest, jaw, shoulder, arm or back pain lasting at least one minute, with or without radiation
 - (2) Provoked by exertion or emotional stress
 - (3) Relieved by rest or nitroglycerin
- b. Atypical angina
 - (1) Meets 2 of the above characteristics
- c. Atypical vs. Noncardiac chest pain
 - (1) Meets 1 or none of the above characteristics
- d. The discomfort associated with coronary artery disease may present in many ways. Symptoms may vary with gender, age, other co-morbid conditions, previous chest surgery, location of coronary occlusion, etc. A high index of suspicion and associated cardiac risk factors should be influence the evaluation of complaints of chest discomfort.

II. Risk Assessment

Cardiac risk can be estimated using a CAD risk assessment tool found at <http://tools.acc.org/ASCVD-Risk-Estimator-Plus/-/calculate/estimate/>.

(Using this tool, a 10 year cardiac risk of >20% is considered high risk, 10-20% moderate risk, and <10% low to moderate risk.)

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III. Classification of Angina

If a person has an intermediate or high probability of having CAD, the next step in evaluation is to rapidly categorize the syndrome as stable angina, unstable angina, or acute MI. **Unstable angina and acute MI (Acute Coronary Syndrome) require emergency specialty evaluation.** Stable angina requires “risk stratification” by non-invasive or invasive testing on a less urgent basis.

1. Stable angina – Typical angina symptoms, relieved by rest or nitroglycerin, and unchanged over the past several weeks in terms of frequency and severity.
2. Unstable angina – Typical angina symptoms, lasting longer than usual or more severe or frequent than usual for the individual, or not relieved by usual doses of nitroglycerin.
3. Acute MI – Typical angina symptoms unrelieved by rest or nitroglycerin. The differentiation between unstable angina and acute MI is based on serial EKG and serum enzyme findings or imaging studies and is beyond the scope of this clinical guideline.

IV. Initial Evaluation

Documentation of the chronic illness will be documented in accordance with [OP-140137](#) entitled “Chronic Illness Management” and utilizing the “Chronic Illness Note/Physical Examination” form in the electronic healthcare record (EHR).

A. History

1. Chest pain type – location, character, severity, radiation,
2. Associated symptoms – diaphoresis, nausea, vomiting, dyspnea,
3. Exacerbating factors – exertion, stress, cold
4. Relieving factors – rest, nitroglycerin
5. Personal history – diabetes, hypertension, smoking, hyperlipidemia, cerebrovascular disease, peripheral vascular disease
6. Family history – premature CAD
7. Medications – stimulants, illicit drugs

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B. Examination

1. Complete set of vital signs (weight, temperature, pulses-pedal and radial, respiration, blood pressure, pulse oximetry)
2. Chest – heart rate, rhythm, murmur; chest tenderness, lung sounds
3. Neck – bruit, JVD
4. Abdomen—pulsatile mass
5. Extremities—pulses, edema

C. Lab and Other Diagnostic Studies

1. 12-lead EKG. A normal EKG does not exclude coronary disease, but may demonstrate evidence of cardiac pathology and may also be used as a baseline tracing for later comparison.
2. CBC
3. CMP
4. Lipid panel
5. Chest X-ray – if signs or symptoms of CHF, valvular disease, pericardial disease, aortic dissection, or pulmonary disease

D. Risk Stratification

1. Most symptomatic newly diagnosed CAD patients should undergo risk stratification via either stress EKG testing (with or without imaging) or coronary angiography. The decision on the method of risk stratification may be made with input from cardiologist consultation. Left ventricular function may be considered a part of risk stratification. Both the degree of CAD and LV function may influence treatment decisions.
2. Patients with severe comorbidity likely to limit life expectancy or to prevent revascularization may be managed without invasive risk stratification. Some studies have shown no significant changes in statistical long-term outcomes (death, MI, Stroke, Hospital admission) between patients treated medically or those treated with percutaneous intervention, though symptoms of angina may be better controlled following revascularization.

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V. Treatment

The treatment of stable angina has two major purposes:

A. Prevention of MI and death

All patients with CAD should be counselled on lifestyle changes associated with improved clinical outcome (diet, exercise, tobacco) and recommended lifelong statin therapy.

1. Lipid-lowering agents – for aggressive LDL reduction with goal of 30-50% LDL reduction.
 - a. For those with very high risks, goal should be 50% reduction in LDL with high dose statin (Lipitor 40-80mg).
 - b. For those with high risk, goal should be 30-50% LDL reduction with moderate dose statin (Lipitor 10-20mg, Pravastatin 40 mg, or Simvastatin 40mg).
 - c. For those with very high risk that don't meet goal with high dose Atorvastatin, Rouvastatin 20-40mg or addition of Ezetimibe should be considered.
2. Aspirin – 81 to 325 mg/d if no contraindications. Clopidogrel can be used in aspirin allergic patient (may also be used alone or with aspirin in some patients with stents).

B. Ischemia reduction and symptom relief

1. Sub-lingual nitroglycerin PRN
2. Beta blocker (if no contraindications) to reduce resting heart rate to 50-60 bpm.
3. ACE inhibitor in all CAD patients who also have diabetes or left ventricular systolic dysfunction, if no contraindications.
4. Calcium channel blockers (long-acting) – if contraindications to beta blockers exist, if symptomatic relief cannot be achieved by combination of beta blockers and nitrates, or if vasospastic angina is suspected.
5. Long-acting nitrates – if contraindications to both beta blockers and calcium channel blockers exist. Long-acting nitrates also add to the anti-anginal effects of both beta blockers and calcium channel blockers.
6. Treatment of coexisting medical conditions—anemia, hyperthyroidism, hypertension, diabetes, smoking, obesity, hypoxia due to lung disease.

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- C. Treatment of stable angina can be summarized using the following mnemonic (ABCDE):
1. Aspirin and Antianginal therapy
 2. Beta-blocker and Blood pressure control
 3. Cholesterol lowering, Cigarettes (smoking cessation)
 4. Diet and Diabetes
 5. Education and Exercise

VI. Goals of Therapy

- A. Decrease in frequency and severity of anginal episodes
- B. Increased exercise capacity
- C. Reduce LDL to 30-50% depending on risk.
- D. Control of comorbidities (Diabetes, Hypertension, Congestive Heart Failure)
- E. Reduce BP to <130/85

VII. Routine Follow-Up

Once goals of therapy have been reached and the patient is stable, routine follow-up in chronic clinic should be arranged as follows:

- A. Chronic Clinic Visit
1. Review medication regimen – adherence, side effects, frequency of sublingual nitroglycerin use
 2. Interval history – lifestyle modifications, change in frequency of anginal symptoms, symptoms of congestive heart failure; change in activity level.
 3. Exam – BP, pulse, weight, heart sounds, lung sounds, pulses, edema, carotid bruit, abdomen for pulsatile mass.
 4. Patient education – lifestyle modifications, medication adherence
 5. Categorize in accordance with “Severity Classification of Common Chronic Illness” (OP-140137, Attachment A).

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B. Annually

1. Interval history – as above
2. Complete physical exam
3. Baseline EKG (then at providers discretion)
4. Repeat risk stratification methods as recommended by cardiologist.
5. Oral exam by provider with referral to dental as needed.
6. Laboratory
 - a. CBC
 - b. CMP
 - c. Fasting Lipid Profile
7. Vaccines
 - a. Influenza (annually)
 - b. Pneumovax (revaccination is recommended only if the patient received a first dose prior to age 65. Give a second dose at or after age 65 only when 5 or more years have elapsed since the previous dose).

VIII. References

OP- 140137 entitled “Chronic Illness Management”

Based on the (March, 2002 American College of Cardiology/American Heart Association Task force on Practice Guidelines – Management of Patients with Chronic Stable Angina)

Medscape. Coronary Artery Disease. Retrieved 12/8/2010:
www.medscape.com

IX. Action

The chief medical officer, Office of Medical Services will be responsible for compliance with this procedure.

The chief medical officer, Office of Medical Services will be responsible for the annual review and revisions.

Any exceptions to this procedure will require prior written approval from the director.

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This procedure will be effective as indicated.

Replaced: Medical Services Resource Manual 140137-07 entitled "Management of Coronary Artery Disease" dated September 5, 2017.

Distribution: Medical Services Resource Manual

Referenced Forms	Title	Located In
DOC 140137A	"Chronic Illness Note and/or Physical Examination"	OP-140137

Attachments

Attachment A	"Severity Classification of Common Chronic Illness"	OP-140137
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