

Sample Topic

Coronary Atherosclerosis



The Medical Disability Advisor: Workplace Guidelines for Disability Duration

Fifth Edition

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Editor-in-Chief

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Coronary Atherosclerosis

Related Terms

- Arteriosclerotic Heart Disease
- ASHD
- CAD
- Chronic Ischemic Heart Disease
- Coronary Artery Disease

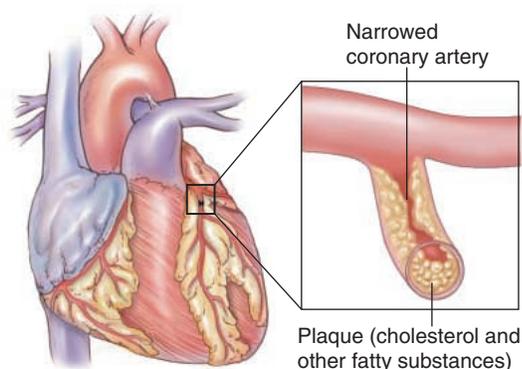
Medical Codes

- ICD-9-CM: 411, 414, 414.0, 414.8, 414.9
- ICD-10: I24.0, I24.1, I24.8, I24.9, I25.1, I25.5, I25.6, I25.8, I25.9

Definition

Coronary atherosclerosis is an inflammatory disease characterized by the accumulation of cholesterol deposits on the walls of the coronary arteries that supply the heart muscle. As the cholesterol deposits (atheromas or plaques) slowly increase in size over the years, the artery becomes narrow in places (stenosis), and blood flow to the heart is reduced. The stenosis may become so significant that the blood supply is inadequate to meet the needs of the heart (myocardial ischemia), and the affected part of the heart muscle no longer functions normally. Myocardial ischemia typically results in chest pain (angina pectoris), but may also cause no symptoms (silent ischemia). Total blockage of a coronary artery results in a heart attack (myocardial infarction).

Risk: Risk factors for coronary atherosclerosis include male sex, age, family history of atherosclerosis (particularly before age 50), high blood pressure (hypertension), diabetes, a high level of total cholesterol or of low-density lipoprotein (LDL) cholesterol (a.k.a., “bad” cholesterol), smoking, obesity, poor physical fitness, and elevated homocysteine levels. Emotional stress also may play a role. In contrast to LDL cholesterol, high levels of high-density lipoprotein (HDL) cholesterol (a.k.a., “good” cholesterol) decrease the risk for developing coronary atherosclerosis. Men are 4 times more likely to develop coronary atherosclerosis than are women. Men ages 50 to 60 years are at highest risk, while in women, risk peaks at 60 to 70 years.



Incidence and Prevalence: Coronary atherosclerosis causes 42% of all deaths in the US (Warber 173).

Diagnosis

History: Symptoms are not always apparent in the early stages of coronary atherosclerosis. In later stages, symptoms typically include exertional chest pain and pressure (angina) occasionally with radiation to the neck or jaw that is relieved by rest. Individuals may have a history of heart attack (myocardial infarction).

Physical exam: The exam is usually not directly helpful in this diagnosis, but may reveal risk factors, such as hypertension or obesity.

Tests: Blood cholesterol testing demonstrates increased total cholesterol and increased low-density lipoproteins. An electrocardiogram (ECG) at rest looks for electrical abnormalities of the heart. An ECG during physical exertion (exercise stress test) can detect heart abnormalities induced by lack of blood flow, and subsequent lack of oxygen, to the heart muscle. If an individual can't exercise to the degree needed for the stress test, a drug can be given to simulate the effect of exercise on the heart (physiologic stress test).

Nuclear scanning during a stress test (radionuclide stress test) involves injecting a radioactive isotope into a vein before the test. During the test, the examiner can watch the flow of blood through the heart and can identify areas in which blood flow is decreased. Ultrasound can also be used during a stress test (stress echocardiography) to watch the heart as it pumps while at rest and during exercise.

The most definitive test is the coronary angiogram. A thin catheter is inserted into a vein in the arm or groin. It is guided up into the opening of the coronary arteries. Once it is in place, radiopaque contrast dye is injected through the catheter into the coronary arteries. An x-ray captures the movement of the dye through the heart in a picture called an angiogram. Through this procedure, the exact location and degree of blockage can be identified.

Treatment

Risk factors should be addressed whether or not symptoms are present. This helps prevent progression of coronary artery disease and, to some extent, can reverse it. Many of the risk factors are potentially treatable. Cessation of smoking is essential. Hypertension may be controlled by salt restriction, exercise, stress management, and medication. Diabetes can be managed by diet, exercise, and medication, if necessary. Diet and exercise are also helpful in normalizing cholesterol levels. If this approach is not adequate, cholesterol-lowering drugs can be added. Drugs called “statins,” have proved effective in both primary and secondary prevention of coronary atherosclerosis and have other beneficial effects in reducing cardiovascular disease. They may be used in conjunction with the selective cholesterol absorption inhibitor ezetimibe. A small daily dose of an anti-platelet drug, such as clopidogrel, dipyridamole or aspirin, helps inhibit blood clotting.

Severe coronary atherosclerosis may require a procedure to remove areas of stenosis. Coronary angioplasty uses a catheter inserted into the coronary arteries to the site of blockage. On the end of the catheter is a deflated balloon. Once the catheter is in place, the balloon is inflated, widening the artery. If this approach is not successful, coronary artery bypass surgery may be needed. The blocked portion of coronary artery is removed and replaced with a healthy portion of blood vessel from the leg, chest, or arm.

Prognosis

Once coronary atherosclerosis develops, it must be managed for life. The risk of subsequent cardiac events or disruption of the general circulation depends on control of the disease through medication and lifestyle changes. Medication and lifestyle changes can prevent the disease's progression by reducing future fatty deposits. The statin drugs, which are sometimes used with the selective cholesterol absorption inhibitor ezetimibe, can dramatically reduce fatty deposits already present, raise levels of "good" cholesterol, and reduce the inflammatory process believed to be responsible for the development and progression of coronary atherosclerosis. Medication has the additional effect of softening of the fatty deposits, making them less likely to break away from the artery wall and cause vessel blockage within the heart.

Surgical procedures, such as coronary angioplasty and bypass surgery, successfully remove cholesterol deposits or diseased portions of blood vessels, but the risk of future blockage due to fatty deposits remains.

Differential Diagnoses

- Acute inflammation of the gallbladder
- Angina pectoris
- Costochondritis
- Dyspepsia
- Esophageal spasm
- Hiatal hernia
- Panic attack
- Pericarditis
- Pulmonary embolism

Specialists

- Cardiovascular Internist
- Thoracic Surgeon

Rehabilitation

Rehabilitation for coronary atherosclerosis is similar to that of other cardiac conditions for which surgery is performed. In either case, the exercise program follows three basic progressive phases.

Phase 1 often begins in the hospital with low levels of exercise to prevent some of the negative effects of bed rest (mainly muscle weakness and joint stiffness). Mild exercise can also help reduce episodes of dizziness due to low blood pressure when assuming an upright position (orthostatic hypotension) and maintain overall mobility. Exercise may begin in the coronary care unit of a hospital. Individuals perform low-level exercises lying on the back (supine position). The individual progresses to exercises while sitting and, eventually, while standing. Progressive walking and, eventually, stair-climbing are important components of the exercise program. Intensity is gradually increased until the individual is discharged from the hospital.

Phase 2 usually begins after the individual is discharged from the hospital. Individuals who have not been hospitalized usually begin at this phase. Goals are to improve functional capacity by increasing physical endurance and promoting return to activity. This is done in an outpatient setting, such as a rehabilitation center. Electrocardiographic electrodes attached to the individual are used to record the continuous electrical activity of the heart muscle.

Phase 3 continues in an outpatient setting, such as a rehabilitation center, and begins 3 to 6 months from the start of rehabilitation. Depending on the individual's condition, this phase may last for several months. Individuals may stay involved with an outpatient program for up to a year while at modified work duty. Eventually, individuals perform higher levels of exercise with the addition of recreational activities, such as swimming and outdoor hiking. Light jogging at about 5 mph and cycling at about 12 mph is appropriate as long as the individual tolerates it. Because of the various degrees of coronary atherosclerosis, modifications may be made for individuals who had a heart attack and/or surgery.

Comorbid Conditions

- Diabetes mellitus
- Hyperlipidemia
- Obesity
- Severe stress reaction
- Smoking

Complications

Angina, the chest pain associated with worsening coronary atherosclerosis, may remain stable for long periods. With progression of the disease, anginal episodes may increase in severity and duration, become less responsive to medication, and/or be precipitated by less exertion. A worsening or less predictable pattern of angina is referred to as unstable angina.

A heart attack (myocardial infarction) can result if the obstruction in a coronary artery becomes complete. Coronary artery obstruction may be triggered by blood clotting (thrombosis) in a narrowed artery or a clot that separates (embolism) and blocks a smaller artery. A heart attack may cause death of part of the heart muscle due to lack of oxygen.

Individuals who survive massive or repeated heart attacks may be left with so little functioning heart muscle that the heart can no longer pump effectively (congestive heart failure). Ischemic or damaged myocardium may also result in disturbances of heart rhythm (arrhythmias), such as atrial fibrillation or ventricular fibrillation. Atherosclerosis may also occur in other arteries throughout the body and cause impaired circulation.

Factors Influencing Duration

Ability to work depends on the outcome of treatment (relief of symptoms, improved ventricular function), the severity of residual symptoms, the presence or absence of other medical conditions, and the individual's occupation.

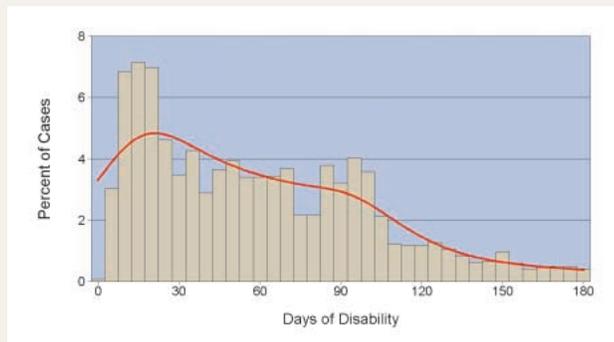
Length of Disability

Duration depends on the condition's severity and which arteries are involved. Contact physician for additional information.

Reference Data

DURATION TRENDS - ICD-9-CM: 414, 414.0

Cases	Mean	Min	Max	No Lost Time	Over 6 Months	Percentile:	5th	25th	Median	75th	95th
2881	67	0	313	0.1%	6.5%	Days:	7	21	55	94	182



Return to Work

In the early stages of coronary atherosclerosis, work is typically not restricted. Although exercise is a recommended activity, it can be carried out after work hours. During periods of intense rehabilitation, time off may be required for visits to the physical therapist or participation in a rehabilitation program.

As the condition progresses and the arteries become more lined with cholesterol deposits, physical capacity is likely to decrease due to decreased coronary blood flow and oxygenation of the heart. At this point, restrictions are made on the basis of stress test results and response to treatment. Individuals with strenuous physical job requirements may need a more sedentary job assignment. If angioplasty or bypass surgery is required, accommodations are needed during the recovery period.

Failure to Recover

Regarding diagnosis:

- Does individual have risk factors, such as male sex, advanced age, family history of atherosclerosis (particularly before age 50), hypertension, diabetes, high blood cholesterol, smoking, obesity, poor physical fitness, elevated homocysteine levels, or prolonged emotional stress?
- Does individual have angina or history of myocardial infarction?
- Were high blood pressure or obesity detected during physical exam?

- Has individual had complete blood lipid testing, ECG both at rest and during exercise?
- Was radionuclide stress test done? Stress echocardiography? Coronary angiogram?
- Were conditions with similar symptoms ruled out?

Regarding treatment:

- Was coronary angioplasty done?
- Was coronary bypass surgery done?
- Is individual taking cholesterol-lowering drugs?
- Is individual addressing unhealthy behaviors that increase heart attack risk?

Regarding prognosis:

- Is individual active in rehabilitation?
- Can individual's employer accommodate any necessary restrictions?
- Does individual have conditions that may affect ability to recover?
- Have any complications, such as unstable angina, myocardial infarction, congestive heart failure, and arrhythmias (e.g., atrial fibrillation or ventricular fibrillation) developed?
- Does individual have atherosclerosis in other arteries throughout the body, causing impaired circulation?

Cited References

Warber, S. L., and S. M. Zick. "Coronary Artery Disease." *Integrative Medicine*. 1st ed. Philadelphia: W.B. Saunders, 2003. 173-184.