Coronary Artery Disease (CAD)

Atherosclerosis
- Major cause of CAD
- Begins as soft deposits of fat that harden with age
- Referred to as “hardening of arteries”

Etiology and Pathophysiology
- Characterized by lipid deposits within intima of artery
- Endothelial injury and inflammation play a major role in development

Stages of Atherosclerosis (Fig. 33-1 pg. 703)

1. White plaque
2. Fatty streak
3. Fibrous plaque
4. Complex plaque
5. Necrotic core
6. Stenosis
7. Thrombus
8. Arterial rupture
Coronary Artery Disease
Etiology and Pathophysiology

• C-reactive protein (CRP)
  – Protein produced by liver
  – Nonspecific marker of inflammation
  – Increased in many patients with CAD
  – Chronic exposure to CRP linked with unstable
  plaques and oxidation of LDL cholesterol

Coronary Artery Disease
Etiology and Pathophysiology

• Collateral circulation
  – Arterial anastomoses (or connections) within
  coronary circulation
  – Increased with chronic ischemia
  – May be inadequate with rapid-onset CAD
  – Old vs. young

Vessel Occlusion With
Collateral Circulation Fig 33-2 pg. 703
Risk Factors for CAD

- Nonmodifiable risk factors
  - Age
  - Gender
  - Ethnicity
  - Family history
  - Genetic predisposition

- Major modifiable risk factors
  - Elevated serum lipids
    - Cholesterol >200 mg/dL (5.2 mmol/L)
    - Triglycerides >150 mg/dL (3.7 mmol/L)
    - High-density lipoproteins (HDL)
    - Low-density lipoproteins (LDL)

- Hypertension
  - >140/90 mm Hg
  - Goal for > age 60 is <150/90 mm Hg
  - Begin lifestyle changes for prehypertension
  - Treat stage 1 or 2 hypertension with drugs
Risk Factors for CAD

- Major modifiable risk factors
  - Tobacco use
    - Increased catecholamine release
    - ↑ LDL, ↓ HDL, ↑ oxygen radicals
    - ↑ Carbon monoxide
  - Second-hand smoke
  - Physical inactivity
  - Obesity

Risk Factors for CAD

- Contributing modifiable risk factors
  - Diabetes
  - Metabolic syndrome
  - Psychologic states
  - Homocysteine level
  - Substance abuse

Audience Response Question

Two risk factors for coronary artery disease that increase the workload of the heart and increase myocardial oxygen demand are
- Obesity and smokeless tobacco use.
- Hypertension and cigarette smoking.
- Elevated serum lipids and diabetes mellitus.
- Physical inactivity and elevated homocysteine levels.
Audience Response Question

Which patient is most at risk for developing coronary artery disease?

a. A hypertensive patient who smokes cigarettes
b. An overweight patient who uses smokeless tobacco
c. A patient who has diabetes and uses methamphetamines
d. A sedentary patient who has elevated homocysteine levels

Nursing and Interprofessional Care: CAD

Health Promotion

• Identification of people at high risk
  – Health history, including family history
  – Presence of cardiovascular symptoms
  – Environmental patterns: diet, activity
  – Psychosocial history
  – Values and beliefs about health and illness

• Manage high-risk persons by controlling modifiable risk factors
• RN has major role in teaching health-promoting behaviors
• Lifestyle changes
  – Education (diet, exercise, tobacco, illicit drugs)
  – Clarify personal values
  – Set realistic goals
Nursing and Interprofessional Care: CAD

- Physical fitness
  - FITT formula: 30 minutes most days plus weight training 2 days a week
- Frequency (how often)
- Intensity (how hard)
- Type (isotonic)
- Time (how long)

- Regular physical activity contributes to
  - Weight reduction
  - Reduction of >10% in systolic BP
  - Increase in HDL cholesterol

Nutritional therapy (Lower LDL)

- ↓ Saturated fats and cholesterol
- ↓ Red meat, egg yolks, whole milk
- ↓ Alcohol and simple sugars

- ↑ Complex carbohydrates and fiber
  (whole grains, fruits, vegetables, and fiber)
- ↑ Omega-3 fatty acids
  (AHA recommends eating tofu, soybean, canola, walnut, flaxseed because these products contain alpha-linolenic acid, which becomes omega-3 fatty acid in the body.)

Audience Response Question

The nurse determines that teaching about implementing dietary changes to decrease the risk of CAD has been effective when the patient says,

a. “I should not eat any red meat such as beef, pork, or lamb.”
b. “I should have some type of fish at least 3 times a week.”
c. “Most of my fat intake should be from olive oil or the oils in nuts.”
d. “If I reduce the fat in my diet to about 5% of my calories, I will be much healthier.”
Nursing and Interprofessional Care: CAD

• Lipid-lowering drug therapy
  – If diet and exercise ineffective
  – Statins – atorvastatin (Lipitor), simvastatin (Zocor)
    • Inhibit cholesterol synthesis, decrease LDL, increase HDL
    • Monitor for liver damage and myopathy

Nursing and Interprofessional Care: CAD

• Antiplatelet therapy
  – ASA (81 mg or 325 mg)
  – Clopidogrel (Plavix)

Gerontologic Considerations CAD

• Increased incidence and mortality associated with CAD in older adults
• Strategies to reduce risk and treat CAD are effective
• Treat hypertension, ↑ lipids
• Smoking cessation
Gerontologic Considerations
CAD
• Necessary to modify guidelines for physical activity
  – Longer warm-up
  – Longer periods of low-level activity
  – Longer rest periods
  – Avoid extremes of temperature
  – 30 minutes most days minimum
• Most likely to change when hospitalized or symptomatic

Clinical Manifestations of CAD
Angina
• Chronic and progressive disease
• O₂ demand > O₂ supply → myocardial ischemia
• Angina = clinical manifestation
  • Occurs when arteries are blocked 70% or more
  • 50% or more for left main coronary artery

Clinical Manifestations of CAD
Chronic Stable Angina
• Intermittent CP that occurs over a long period with same pattern of onset, duration, and intensity of symptoms
• Provoked by physical exertion, stress, emotional upset
• Few minutes in duration, subsides when precipitating factors resolved
• Control with drugs (i.e. nitroglycerin)
Chronic Stable Angina
Types of Angina

- Silent ischemia
  - Ischemia that occurs in absence of any subjective symptoms
  - Associated with diabetic neuropathy
  - Confirmed by ECG changes
    - ST segment depression and/or T-wave inversion

- Prinzmetal’s (variant) angina
  - Rare
  - Occurs at rest
  - Can be seen in patients with a history of migraine headaches, Raynaud’s phenomenon and heavy smoking
  - Spasm of a major coronary artery (calcium channel blockers)
  - CAD may or may not be present
Chronic Stable Angina
Types of Angina

• Microvascular angina (coronary microvascular disease)
  – CP occurs in absence of significant CAD or coronary spasm of a major coronary artery
  – CP related to myocardial ischemia associated with atherosclerosis or spasm of the small distal branch vessels of the coronary microcirculation
  – Prevention and treatment follows CAD recommendations

Chronic Stable Angina
Interprofessional Care: Medication Therapy

• Goal: ↓ O₂ demand and/or ↑ O₂ supply
• Short-acting nitrates SL NTG
  – Dilate peripheral and coronary blood vessels
  – Give sublingually or by spray
  – If no relief in 5 minutes, call EMS; if some relief, repeat every 5 minutes for maximum 3 doses
  – Patient teaching
  – Can use prophylactically

Chronic Stable Angina
Interprofessional Care: Medication Therapy

• Long-acting nitrates –oral, NTG ointment, Transdermal controlled-release NTG
  – To reduce angina incidence
  – Main side effects: headache (Tylenol), orthostatic hypotension
Chronic Stable Angina
Interprofessional Care: Medication Therapy

• ACE and ARBs:
  – benazepril (Lotensin)
  – enalapril (Vasotec)
  – lisinopril (Zestril)
  – losartan (Cozaar)
• β-Blockers:
  – atenolol (Tenormin)
  – metoprolol (Lopressor)
• Calcium channel blockers:
  – Diltiazem (Cardizem)
  – amlodipine (Norvasc)
  – nifedipine (Procardia)

Chronic Stable Angina
Interprofessional Care: Medication Therapy

• Lipid lowering drugs
  – atorvastatin (Lipitor)
  – simvastatin (Zocor)

Chronic Stable Angina
Interprofessional Care: Diagnostic Studies

– Chest x-ray
– 12-lead ECG
– Laboratory studies – lipid profile, CRP
– Echocardiogram
– Exercise stress test (physical/pharmacologic)
– Electron Beam CT (EBCT)
– Coronary CT Angiography (CCTA)
Chronic Stable Angina
Nursing/Interprofessional Care: Diagnostic Studies

- Cardiac catheterization/coronary angiography
  - Visualize blockages (diagnostic)
  - Open blockages (interventional)
    - Percutaneous coronary intervention (PCI)
    - Balloon angioplasty
    - Stent

Placement of Coronary Artery Stent Fig 33-5 pg. 718

Pre-PCI and Post-PCI With Stent Placement Fig 33-6 pg. 718
Nursing Management
Acute Coronary Syndrome

- Coronary revascularization: PCI
  - Monitor for recurrent angina
  - Frequent VS, including cardiac rhythm
  - Monitor catheter insertion site for bleeding
  - Neurovascular assessment
  - Bed rest per institutional policy

Acute Coronary Syndrome Fig 33-7 pg. 718

Relationships among coronary artery disease, chronic stable angina, and acute coronary syndrome.

Nursing Management
Chronic Stable Angina

- Acute Intervention
  - Upright position
  - Supplemental oxygen
  - Assess vital signs
  - 12-lead ECG
  - Administer NTG followed by an opioid analgesic, if needed
  - Assess heart and breath sounds
Nursing Management
Chronic Stable Angina

- Ambulatory Care
  - Provide reassurance
  - Patient teaching
    - CAD and angina
    - Precipitating factors for angina
    - Risk factor reduction
    - Drugs

Acute Coronary Syndrome
Etiology and Pathophysiology

- Result
  - Partial occlusion of coronary artery: UA or NSTEMI
  - Total occlusion of coronary artery: STEMI

Clinical Manifestations of ACS
Unstable Angina

- New in onset
- Occurs at rest
- Increase in frequency, duration, or with less effort
- Pain lasting > 10 minutes
- Needs immediate treatment
- Symptoms in women often under-recognized as heart related
Clinical Manifestations of ACS
Myocardial Infarction (MI)

• ST-elevation and non-ST-elevation
• Result of abrupt stoppage of blood flow through a coronary artery, causing irreversible myocardial cell death (necrosis)
  – Preexisting CAD
  – STEMI - occlusive thrombus
  – NSTEMI - non-occlusive thrombus

Myocardial Infarction From Occlusion
(Fig 33-11 pg. 724)

Clinical Manifestations of ACS
Myocardial Infarction

• Severe CP not relieved by rest, position change, or nitrate administration
  • Heaviness, pressure, tightness, burning, constriction, crushing
  • Substernal or epigastric
  • May radiate to neck, lower jaw, arms, back
  – Often occurs in early morning
  – Atypical in women, elderly
  – No pain if cardiac neuropathy (diabetes)
Clinical Manifestations of ACS
Myocardial Infarction

• Catecholamine release and stimulation of SNS
  – Release of glycogen
  – Diaphoresis
  – Increased HR and BP
  – Vasconstriction of peripheral blood vessels
  – Skin: ashen, clammy, and/or cool to touch

Clinical Manifestations of ACS
Myocardial Infarction

• Cardiovascular
  – Initially, ↑ HR and BP, then ↓ BP (secondary to ↓ in CO)
  – Crackles
  – Jugular venous distention
  – Abnormal heart sounds
    • S3 or S4
    • New murmur

Clinical Manifestations of ACS
Myocardial Infarction

• Nausea and vomiting
  – Reflex stimulation of the vomiting center by severe pain
  – Vasovagal reflex

• Fever
  – Up to 100.4° F (38° C) in first 24-48 hours
  – Systemic inflammatory process caused by heart cell death
Unstable Angina and MI
Diagnostic Studies
• 12-lead ECG
  – Compare to previous ECG
  – Changes in QRS complex, ST segment, and T wave
  – Serial ECGs reflect evolution of MI
  – Distinguish between STEMI and NSTEMI/UA for dx and tx purpose

Myocardial Infarction
Healing Process
• Within 24 hours, leukocytes infiltrate the area of cell death
• Proteolytic enzymes of neutrophils and macrophages begin to remove necrotic tissue by fourth day → thin wall
• Necrotic zone identifiable by ECG changes
• Collagen matrix laid down

Myocardial Infarction
Healing Process
• 10 to 14 days after MI, scar tissue is still weak
• Heart muscle vulnerable to stress
• Monitor patient carefully as activity level increases
Myocardial Infarction
Healing Process
• By 6 weeks after MI, scar tissue has replaced necrotic tissue
  – Area is said to be healed, but less compliant
• Ventricular remodeling
  – Normal myocardium will hypertrophy and dilate in an attempt to compensate for infarcted muscle

Complications of Myocardial Infarction
• Dysrhythmias
  – Most common complication
  – Can be caused by ischemia, electrolyte imbalances, or SNS stimulation
  – VT and VF are most common cause of death in prehospitalization period

Complications of Myocardial Infarction
• Heart failure
  – Occurs when pumping power of heart has diminished
  – Left-sided HF
    • Mild dyspnea, restlessness, agitation, slight tachycardia initially
  – Right-sided HF
    • Jugular venous distention, hepatic congestion, lower extremity edema
Complications of Myocardial Infarction

• **Cardiogenic shock**
  – Occurs because of
    • Severe LV failure, papillary muscle rupture, ventricular septal rupture, LV free wall rupture, right ventricular infarction
  – Requires aggressive management
    • Associated with a high death rate

Complications of Myocardial Infarction

• **Papillary muscle dysfunction or rupture**
  – Causes mitral valve regurgitation
  – Aggravates an already compromised LV → rapid clinical deterioration

• **Left ventricular aneurysm**
  – Myocardial wall becomes thinned and bulges out during contraction
  – Leads to HF, dysrhythmias, and angina

Complications of Myocardial Infarction

• **Ventricular septal wall rupture and left ventricular free wall rupture**
  – New, loud systolic murmur
  – HF and cardiogenic shock
  – Emergency repair
  – Rare condition associated with high death rate
Complications of Myocardial Infarction

- **Acute pericarditis**
  - Inflammation of visceral and/or parietal pericardium
  - Mild to severe chest pain
    - Increases with inspiration, coughing, movement of upper body
    - Relieved by sitting in forward position
  - Pericardial friction rub
  - ECG changes (diffuse ST-segment elevations)

Unstable Angina and MI
Diagnostic Studies

- **Cardiac Biomarkers**
  - Troponin
    - Rises within 4-6 hours, peaks 10-24 hours, detected for up to 10-14 days
  - Creatine kinase (CK)
    - CK-MB cardiac specific
    - Rises in 3-6 hours, peaks in 12-24 hours, returns to baseline within 12-48 hours
  - Serial Cardiac Biomarkers

 Unstable Angina and MI
Diagnostic Studies

**STEMI**

- Usually have a complete coronary occlusion.
- ST elevation is first seen on the 12-lead ECG.
- Within few hours to days, T-wave inversion and pathologic Q waves develop.

**NSTEMI or UA**

- Usually have transient thrombosis or incomplete coronary occlusion.
- These patients often develop ST depression or T wave inversion on the initial ECG.
- They usually do not develop pathologic Q waves.
Unstable Angina and MI Diagnostic Studies

- Coronary angiography
  - For patients with a STEMI
  - Not for patients with UA or NSTEMI
- Pharmacologic stress testing
  - For patients with abnormal but nondiagnostic ECG and negative biomarkers

Interprofessional Care
Acute Coronary Syndrome

- Initial interventions
  - 12-lead ECG
  - Upright position
  - Oxygen – keep O₂ sat > 93%
  - IV access
  - Nitroglycerin (SL) and ASA (chewable)
  - Statin
  - Morphine

- Ongoing monitoring
  - Treat dysrhythmias
  - Frequent vital sign monitoring
  - Bed rest/limited activity for 12–24 hours
- UA or NSTEMI
  - Dual antiplatelet therapy – aspirin, clopidogrel (Plavix), and heparin
  - Cardiac catheterization with PCI once stable
  - Reperfusion therapy
Interprofessional Care
Acute Coronary Syndrome

• Emergent PCI
  – Treatment of choice for confirmed STEMI
  – Goal: 90 minutes from door to catheter laboratory
  – Balloon angioplasty + stent(s)
  – Many advantages over CABG

Interprofessional Care
Acute Coronary Syndrome

• Thrombolytic therapy
  – Only for patients with a STEMI
  • Agencies that do not have cardiac catheterization resources
  – Given IV within 30 minutes of arrival to the ED
  – Patient selection critical due to bleeding complications

Interprofessional Care
Acute Coronary Syndrome

• Thrombolytic therapy
  – Draw blood and start 2–3 IV sites
  – Complete invasive procedures prior
  – Administer according to protocol
  – Monitor closely for signs of bleeding
  – Assess for signs of reperfusion
    • Cardiac rhythm – return of ST segment to baseline best sign, VS, cardio/pulmonary and neurological assessment
  • IV heparin to prevent reocclusion
Interprofessional Care
Acute Coronary Syndrome

• Surgical revascularization if:
  – Failed medical management
  – Presence of left main coronary artery or three-vessel disease
  – Not a candidate for PCI (e.g., blockages are long or difficult to access)
  – Failed PCI with ongoing chest pain
  – History of diabetes mellitus, LV dysfunction, chronic kidney disease

Interprofessional Care
Acute Coronary Syndrome

• Traditional coronary artery bypass graft (CABG) surgery
  – Requires sternotomy and cardiopulmonary bypass (CPB)
  – Uses arteries and veins for grafts
    • The internal mammary artery (IMA) is most common artery used for bypass graft
    • Radial artery is another potential graft

Cardiopulmonary Bypass

• Blood diverted from patient’s heart to a machine where it is oxygenated and returned (via a pump) to the patient
• Allows surgeon to operate on a quiet, nonbeating, bloodless heart while perfusion to vital organs is maintained.
Nursing Management
Acute Coronary Syndrome

• Complications related to CPB
  – Bleeding and anemia from damage to RBCs and platelets
  – Fluid and electrolyte imbalances
  – Hypothermia as blood is cooled as it passes through the bypass machine
  – Infections

Internal Mammary Artery and Saphenous Vein Grafts Fig 33-11 pg. 724

Interprofessional Care
Acute Coronary Syndrome

• Minimally invasive direct coronary artery bypass (MIDCAB)
  – For patients with disease of left anterior descending or right coronary artery
  – Technique requires several small incisions between the ribs or a mini thoracotomy
  – Does not involve a sternotomy and CPB
Interprofessional Care
Acute Coronary Syndrome

• Off-pump coronary artery bypass (OPCAB)
  – Sternotomy but no CPB
• Robotic or totally endoscopic coronary artery bypass (TECAB)
• Transmyocardial laser revascularization
  – Indirect revascularization
  – High-energy laser creates channels in heart to allow blood flow to ischemic areas

Nursing Management
Acute Coronary Syndrome

• Coronary revascularization: CABG
  – ICU for first 24–36 hours
  – Pulmonary artery catheter
  – Intraarterial line
  – Pleural/mediastinal chest tubes
  – Continuous ECG
  – ET tube with mechanical ventilation
  – Epicardial pacing wires
  – Urinary catheter
  – NG tube

Nursing Management
Acute Coronary Syndrome

• CABG: postoperative nursing care
  – Assess patient for bleeding
  – Monitor hemodynamic status
  – Assess fluid status
  – Replace blood and electrolytes PRN
  – Restore temperature
  – Monitor for atrial fibrillation (which is common)
Nursing Management
Acute Coronary Syndrome

• CABG: postoperative nursing care
  – Surgical site care
    • Radial artery harvest site
    • Leg incisions
    • Chest incision
  – Pain management
  – DVT prevention
  – Pulmonary hygiene
  – Cognitive dysfunction

Interprofessional Care
Acute Coronary Syndrome

• Drug therapy
  – IV nitroglycerin (NTG)
  – Morphine
  – β-adrenergic blockers
  – ACE inhibitors
  – Antidysrhythmic drugs
  – Lipid-lowering drugs
  – Stool softeners

Audience Response Question

A patient is admitted to the coronary care unit following a cardiac arrest and successful cardiopulmonary resuscitation. When reviewing the health care provider’s admission orders, which order should the nurse question?

a. Oxygen at 4 L/min per nasal cannula
b. Morphine sulfate 2 mg IV every 10 minutes until the pain is relieved
c. Tissue plasminogen activator (tPA) 100 mg IV infused over 3 hours
d. IV nitroglycerin at 5 mcg/minute and increase 5 mcg/minute every 3 to 5 minutes
Interprofessional Care
Acute Coronary Syndrome

- Nutritional therapy
  - Initially NPO—until stable
  - Progress to Cardiac Diet
    - Low salt
    - Low saturated fat
    - Low cholesterol

Nursing Management
Acute Coronary Syndrome

- Acute Care
  - Pain: nitroglycerin, morphine, oxygen
  - Continuous monitoring
    - ECG
    - ST segment
    - Heart and breath sounds
    - VS, pulse oximetry, I and O
  - Rest and comfort
    - Balance rest and activity
    - Begin cardiac rehabilitation

Nursing Management
Acute Coronary Syndrome

- Acute Care
  - Anxiety reduction
    - Identify source and alleviate
    - Patient teaching important
  - Emotional and behavioral reaction
    - Maximize patient’s social support systems
    - Consider open visitation
Nursing Management
Chronic Stable Angina and ACS

• Nursing Assessment: Subjective Data
  – Health history
    • CAD/chest pain/angina/ MI
    • Valve disease
    • Heart failure/cardiomyopathy,
    • Hypertension, diabetes, anemia, lung disease, hyperlipidemia
  – Drugs
  – History of present illness

• Nursing Assessment: Objective Data
  – Anxious, fearful, restless, distressed
  – Cool, clammy, pale skin
  – Tachycardia or bradycardia
  – Pulsus alternans
  – Pulse deficit
  – Dysrhythmias
  – S_3_, S_4_, ↑ or ↓ BP, murmur
Nursing Management
Chronic Stable Angina and ACS

• Nursing Diagnoses
  – Decreased cardiac output
  – Acute pain
  – Anxiety
  – Activity intolerance
  – Ineffective health management

Nursing Management
Chronic Stable Angina and ACS

• Planning: Overall goals
  – Relief of pain
  – Preservation of heart muscle
  – Immediate and appropriate treatment
  – Effective coping with illness-associated anxiety
  – Participation in a rehabilitation plan
  – Reduction of risk factors

Nursing Management
Acute Coronary Syndrome

• Ambulatory Care
  – Cardiac rehabilitation
  – Patient and caregiver teaching
  – Physical activity
    • Gradually increased
    • Monitor heart rate
    • Low-level stress test before discharge
    • Isometric vs isotonic activities
Nursing Management
Acute Coronary Syndrome

• Ambulatory Care
  – Resumption of sexual activity – moderate energy activity equivalent to climbing 2 flights of stairs
  – Teach when discuss other physical activity
  – Erectile dysfunction drugs contraindicated with nitrates
  – Prophylactic nitrates before sexual activity
  – When to avoid sex
  – Typically 7–10 days post MI or when patient can climb two flights of stairs

Nursing Management
Acute Coronary Syndrome

• Evaluation
  – Stable vital signs
  – Relief of pain
  – Decreased anxiety
  – Realistic program of activity
  – Effective management of therapeutic regimen

Sudden Cardiac Death (SCD)

• Unexpected death from cardiac causes – almost 400,000 annually
• Abrupt disruption in cardiac function, resulting in loss of CO and cerebral blood flow
• Most commonly caused by
  – Ventricular dysrhythmias
  – Structural heart disease
  – Conduction disturbances
Sudden Cardiac Death (SCD)

• Due to CAD fall into two groups:
• Did not have an acute MI —no warning signs or symptoms if no MI
• Did have an acute MI —prodromal symptoms if associated with MI
  — Chest pain, palpitations, dyspnea
  — Death usually within 1 hour of onset of acute symptoms

Sudden Cardiac Death Nursing/Interprofessional Care

• Diagnostic workup to rule out or confirm MI
  — Cardiac biomarkers
  — ECGs
  — Treat accordingly
• Cardiac catheterization
• PCI or CABG

Sudden Cardiac Death Nursing/Interprofessional Care

• 24-hour Holter monitoring
• Exercise stress testing
• Signal-averaged ECG
• Electrophysiologic study (EPS)
• Implantable cardioverter-defibrillator (ICD)
• Antidysrhythmic drugs
• LifeVest
Sudden Cardiac Death
Nursing/Interprofessional Care

- Patient teaching
- Psychosocial adaptation
  - “Brush with death”
  - “Time bomb” mentality
- Additional issues
  - Driving restrictions
  - Role reversal
  - Change in occupation

Audience Response Question
The most significant factor in long-term survival of a patient with sudden cardiac death is
a. Absence of underlying heart disease.
b. Rapid institution of emergency services and procedures.
c. Performance of perfect technique in resuscitation procedures.
d. Maintenance of 50% of normal cardiac output during resuscitation efforts.

Audience Response Question
The nurse is caring for a patient who survived a sudden cardiac death. What should the nurse include in the discharge instructions?
a. “Because you responded well to CPR, you will not need an implanted defibrillator.”
b. “The most common way to prevent another arrest is to take your prescribed drugs.”
c. “Your family members should learn how to perform CPR and practice these skills regularly.”
d. “Since there was no evidence of a heart attack, you do not need to worry about another episode.”