

CARDIAC SURGERY: POSTOPERATIVE CARE—CORONARY ARTERY BYPASS GRAFT (CABG), MINIMALLY INVASIVE DIRECT CORONARY ARTERY BYPASS (MIDCAB), CARDIOMYOPLASTY, VALVE REPLACEMENT

The goal of treatment for heart disease is to maximize cardiac output. Surgically this may be done by improving myocardial muscle function and blood flow through procedures such as the traditional CABG (or via less invasive procedures such as MIDCAB, percutaneous transmyocardial revascularization [PTMR], and/or port access requiring four small incisions under the left breast), wrapping the latissimus dorsi muscle around the heart, and/or repair or replacement of defective valves. Of the three types of cardiac surgery—(1) reparative (e.g., closure of atrial or ventricular septal defect, repair of mitral stenosis), (2) reconstructive (e.g., CABG, reconstruction of an incompetent valve), and (3) substitutional (e.g., valve replacement, cardiac transplant)—reparative surgeries are more likely to produce cure or prolonged improvement.

CARE SETTING

Inpatient acute hospital on a surgical or post-ICU step-down unit.

RELATED CONCERNS

Angina
Heart failure: chronic
Dysrhythmias
Myocardial infarction
Hemothorax/pneumothorax
Psychosocial aspects of care
Surgical intervention

Patient Assessment Database

The preoperative data presented here depend on the specific disease process and underlying cardiac condition/reserve.

ACTIVITY/REST

May report: History of exercise intolerance
Generalized weakness, fatigue
Inability to perform expected/usual life activities
Insomnia/sleep disturbance

May exhibit: Abnormal heart rate, BP changes with activity
Exertional discomfort or dyspnea
ECG changes/dysrhythmias

CIRCULATION

May report: History of recent/acute MI, three (or more) vessel coronary artery disease, valvular heart disease, hypertension

May exhibit: Variations in BP, heart rate/rhythm
Abnormal heart sounds: S₃/S₄, murmurs
Pallor/cyanosis of skin or mucous membranes
Cool/cold, clammy skin
Edema, JVD
Diminished peripheral pulses
Abnormal breath sounds: crackles
Restlessness/other changes in mentation or sensorium (severe cardiac decompensation)

EGO INTEGRITY

May report: Feeling frightened/apprehensive, helpless
Distress over current events (anger/fear)

May exhibit: Fear of death/eventual outcome of surgery, possible complications
Fear about changes in lifestyle/role functioning
Apprehension, restlessness
Facial/general tension; withdrawal/lack of eye contact
Focus on self; hostility, anger; crying
Changes in heart rate, BP, breathing patterns

FOOD/FLUID

May report: Change in weight
Loss of appetite
Abdominal pain, nausea/vomiting
Change in urine frequency/amount

May exhibit: Weight gain/loss
Dry skin, poor skin turgor
Postural hypotension
Diminished/absent bowel sounds
Edema (generalized, dependent, pitting)

NEUROSENSORY

May report: Fainting spells, vertigo

May exhibit: Changes in orientation or usual response to stimuli
Restlessness; irritability, exaggerated emotional responses; apathy

PAIN/DISCOMFORT

May report: Chest pain, angina

RESPIRATION

May report: Shortness of breath

May exhibit: Crackles
Productive cough

SAFETY

May report: Infectious episode with valvular involvement or myopathy

TEACHING/LEARNING

May report: Familial risk factors of diabetes, heart disease, hypertension, strokes
Use of various cardiovascular drugs
Failure to improve

Postoperative Assessment

PAIN/DISCOMFORT

May report: Incisional discomfort
Pain/paresthesia of shoulders, arms, hands, legs

May exhibit: Guarding
Facial mask of pain; grimacing
Distraction behaviors; moaning; restlessness
Changes in BP/pulse/respiratory rate

RESPIRATION

May report: Inability to cough or take a deep breath

May exhibit: Decreased chest expansion
Splinting/muscle guarding
Dyspnea (normal response to thoracotomy)
Areas of diminished or absent breath sounds (atelectasis)
Anxiety
Changes in ABGs/pulse oximetry

SAFETY

May exhibit: Oozing/bleeding from chest or donor site incisions

TEACHING/LEARNING

Discharge plan DRG projected mean length of inpatient stay: 4.7 days, acute care (additional days may be

considerations: divided among multiple levels of care)

Short-term assistance with food preparation, shopping, transportation, self-care needs, and homemaker/home maintenance tasks

Refer to section at end of plan for postdischarge considerations.

DIAGNOSTIC STUDIES (POSTOPERATIVE)

Hemoglobin (Hb)/hematocrit (Hct): A low Hb reduces oxygen-carrying capacity and indicates need for red blood cell replacement. Elevation of Hct suggests dehydration/need for fluid replacement.

Coagulation studies: Various studies may be done (e.g., platelet count, bleeding and clotting time) to determine therapeutic level of anticoagulant therapy when used.

Electrolytes: Imbalances (hyperkalemia/hypokalemia, hypernatremia/hyponatremia, and hypocalcemia) can affect cardiac function and fluid balance.

ABGs: Verifies oxygenation status, effectiveness of respiratory function, and acid-base balance.

Pulse oximetry: Provides noninvasive measure of oxygenation at tissue level.

BUN/creatinine: Reflects adequacy of renal and liver perfusion/function.

Amylase: Elevation is occasionally seen in high-risk patients, e.g., those with heart failure undergoing valve replacement.

Glucose: Fluctuations may occur because of preoperative nutritional status, presence of diabetes/organ dysfunction, rate of dextrose infusions.

Cardiac enzymes/isoenzymes: Elevated in the presence of acute, recent, or perioperative MI.

Chest x-ray: Reveals heart size and position, pulmonary vasculature, and changes indicative of pulmonary complications (e.g., atelectasis). Verifies condition of valve prosthesis and sternal wires, position of pacing leads, intravascular/cardiac lines.

ECG: Identifies changes in electrical, mechanical function such as might occur in immediate postoperative phase, acute/perioperative MI, valve dysfunction, and/or pericarditis.

Cardiac echocardiogram/catheterization: Measures chamber pressures and pressure gradients across valves, identifies occlusions of arteries, impaired coronary perfusion, and possible wall motion abnormalities.

Transesophageal echocardiography: Useful in diagnosing cardiac valve and chamber abnormalities, such as regurgitation, shunting, or stenosis in patients in whom transthoracic approach is not feasible.

Nuclear studies (e.g., thallium-201, DPY-thallium/Persantine): Heart scans demonstrate coronary artery disease, heart chamber dimensions, and presurgical/postsurgical functional capabilities.

NURSING PRIORITIES

1. Support hemodynamic stability/ventilatory function.
2. Promote relief of pain/discomfort.
3. Promote healing.
4. Provide information about postoperative expectations and treatment regimen.

DISCHARGE GOALS

1. Activity tolerance adequate to meet self-care needs.
2. Pain alleviated/managed.
3. Complications prevented/minimized.
4. Incisions healing.
5. Postdischarge medications, exercise, diet, therapy understood.
6. Plan in place to meet needs after discharge.

NURSING DIAGNOSIS: Cardiac Output, risk for decreased

Risk factors may include

Decreased myocardial contractility secondary to temporary factors (e.g., ventricular wall surgery, recent MI, response to certain medications/drug interactions)

Decreased preload (hypovolemia)

Alterations in electrical conduction (dysrhythmias)

Possibly evidenced by

[Not applicable; presence of signs and symptoms establishes an *actual* diagnosis.]

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Tissue Perfusion: Cardiac (NOC)

Report/display decreased episodes of angina and dysrhythmias.

Demonstrate an increase in activity tolerance.

Participate in activities that maximize/enhance cardiac function.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Hemodynamic Regulation (NIC)</p> <p>Independent</p> <p>Monitor/document trends in heart rate and BP, especially noting hypertension. Be aware of specific systolic/diastolic limits defined for patient.</p> <p>Monitor/document cardiac dysrhythmias. Observe patient response to dysrhythmias, e.g., drop in BP.</p> <p>Observe for changes in usual mental status/orientation/body movement or reflexes, e.g., onset of confusion, disorientation, restlessness, reduced response to stimuli, stupor.</p> <p>Record skin temperature/color and quality/equality of peripheral pulses.</p>	<p>Tachycardia is a common response to discomfort and anxiety, inadequate blood/fluid replacement, and the stress of surgery. However, sustained tachycardia increases cardiac workload and can decrease effective cardiac output. Hypertension can occur (fluid excess or preexisting condition), placing stress on suture lines of new grafts and changing blood flow/pressure within heart chambers and across valves, with increased risk for various complications. Hypotension may result from fluid deficit, dysrhythmias, heart failure/shock.</p> <p>Life-threatening dysrhythmias can occur because of electrolyte imbalance, myocardial ischemia, or alterations in the heart's electrical conduction. Atrial fibrillation/flutter are the most common dysrhythmias occurring around the second or third day post-CABG (older patients or presence of right coronary artery disease increases risk). Decreased cardiac output and hemodynamic compromise that occur with dysrhythmias require prompt intervention. <i>Note:</i> This is the most frequently occurring postoperative complication, often prolonging hospital stay.</p> <p>May indicate decreased cerebral blood flow or oxygenation as a result of diminished cardiac output (sustained or severe dysrhythmias, low BP, heart failure, or thromboembolic phenomena).</p> <p>Warm, pink skin and strong, equal pulses are general indicators of adequate cardiac output.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Hemodynamic Regulation (NIC)</p> <p>Independent</p> <p>Measure/document I&O and fluid balance.</p> <p>Schedule uninterrupted rest/sleep periods. Assist with self-care activities as needed.</p> <p>Monitor graded activity program. Note patient response, vital signs before/during/after activity, development of dysrhythmias.</p> <p>Evaluate presence/degree of anxiety/emotional duress. Encourage the use of relaxation techniques, e.g., deep breathing, diversional activities.</p> <p>Inspect for JVD, peripheral or dependent edema, congestion in lungs, shortness of breath, change in mental status.</p> <p>Investigate reports of angina/severe chest pain accompanied by restlessness, diaphoresis, ECG changes.</p> <p>Investigate/report profound hypotension (unresponsive to fluid challenge), tachycardia, distant heart sounds, stupor/coma.</p>	<p>Useful in determining fluid needs or identifying fluid excesses, which can compromise cardiac output/oxygen consumption.</p> <p>Prevents fatigue/overexhaustion and excessive cardiovascular stress.</p> <p>Regular exercise stimulates circulation/cardiovascular tone and promotes feeling of well-being. Progression of activity depends on cardiac tolerance.</p> <p>Excessive/escalating emotional reactions can affect vital signs and SVR, eventually affecting cardiac function.</p> <p>May be indicative of heart failure (acute or chronic).</p> <p>Although not a common complication of CABG, perioperative or postoperative MI can occur.</p> <p>Development of cardiac tamponade can rapidly progress to cardiac arrest because of the heart's inability to fill adequately for effective cardiac output. <i>Note:</i> This is a relatively rare, life-threatening complication that usually occurs in the immediate postoperative period but can occur later in the recovery phase.</p>
<p>Collaborative</p> <p>Review serial ECGs.</p> <p>Measure cardiac output and other functional parameters as indicated.</p> <p>Administer IV fluids/blood transfusions as needed.</p>	<p>Most frequently done to follow the progress in normalization of electrical conduction patterns/ventricular function after surgery or to identify complications, e.g., perioperative MI.</p> <p>Useful in evaluating response to therapeutic interventions and identifying need for more aggressive/emergency care. <i>Note:</i> Cardiac index, preload/afterload, contractility, and cardiac work can be measured noninvasively by using thoracic electrical bioimpedance (TEB) technique.</p> <p>IV fluids may be discontinued before discharge from the intensive care unit (ICU), or one line (central/peripheral) may remain in place for fluid replacement and/or emergency cardiac medications. Red blood cell (RBC) replacement may be indicated on occasion to restore/maintain adequate circulating volume and enhance oxygen-carrying capacity.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Hemodynamic Regulation (NIC)</p> <p>Collaborative</p> <p>Administer supplemental oxygen as appropriate.</p> <p>Administer electrolytes and medications as indicated, e.g., electrolyte solutions/potassium, antidysrhythmics, beta-blockers, digitalis, diuretics, anticoagulants.</p> <p>Maintain surgically placed pacing wires (atrial/ventricular) and initiate pacing if indicated.</p>	<p>Promotes maximal oxygenation, which can reduce cardiac workload and aid in resolving myocardial ischemia and dysrhythmias.</p> <p>Patient needs are variable, depending on type of surgery, patient's response to surgical intervention, and preexisting conditions (e.g., general health, age, type of heart disease). Electrolytes, antidysrhythmics, and other heart medications may be required on a short-term or long-term basis to maximize cardiac contractility/output.</p> <p>May be required to support cardiac output in presence of conduction disturbances (severe dysrhythmias) that compromise cardiac function.</p>

<p>NURSING DIAGNOSIS: Pain, acute/[Discomfort]</p> <p>May be related to</p> <p>Sternotomy (mediastinal incision) and/or donor site (leg/arm incision)</p> <p>Myocardial ischemia (acute MI, angina)</p> <p>Tissue inflammation/edema formation</p> <p>Intraoperative nerve trauma</p> <p>Possibly evidenced by</p> <p>Reports of incisional discomfort/pain; paresthesia; pain in hand, arm, shoulder</p> <p>Anxiety, restlessness, irritability</p> <p>Distraction behaviors</p> <p>Increased heart rate</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Pain Level (NOC)</p> <p>Verbalize relief/absence of pain.</p> <p>Demonstrate relaxed body posture, ability to rest/sleep appropriately.</p> <p>Pain Control (NOC)</p> <p>Differentiate surgical discomfort from angina/preoperative heart pain.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Pain Management (NIC)</p> <p>Independent</p> <p>Note type/location of incision(s).</p>	<p>Newer procedures(MIDCAB) may require only a “mini” chest incision, with minimal pain.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Pain Management (NIC)</p>	
<p>Independent</p>	
<p>Encourage patient to report type, location, and intensity of pain, rating on a scale of 0–10. Note associated symptoms. Ask the patient how this compares with preoperative chest pain.</p>	<p>Pain is perceived, manifested, and tolerated individually. It is important for patient to differentiate incisional pain from other types of chest pain, such as angina or discomfort from chest tubes. Many CABG patients do not experience severe discomfort in chest incision and may complain more often of donor site incision discomfort. Severe pain in either area should be investigated further for possible complications. <i>Note:</i> There is up to a 24% rate of complications when vessel donor site is a lower extremity.</p>
<p>Observe for anxiety, irritability, crying, restlessness, sleep disturbances.</p>	<p>These nonverbal cues may indicate the presence/degree of pain being experienced.</p>
<p>Monitor vital signs.</p>	<p>Heart rate usually increases with pain, although a bradycardiac response can occur in a severely diseased heart. BP may be elevated slightly with incisional discomfort but may be decreased or unstable if chest pain is severe and/or myocardial damage is occurring.</p>
<p>Identify/promote position of comfort, using adjuncts as necessary.</p>	<p>Pillows/blanket rolls are useful in supporting extremities, maintaining body alignment, and splinting incisions to reduce muscle tension/promote comfort.</p>
<p>Suggest use of saltwater gargle, throat lozenges, or spray.</p>	<p>Helps relieve discomfort in throat associated with endotracheal tube.</p>
<p>Provide comfort measures (e.g., back rubs, position changes), assist with self-care activities, and encourage diversional activities as indicated.</p>	<p>May promote relaxation/redirect attention and reduce analgesic dosage needs/frequency.</p>
<p>Schedule care activities to balance with adequate periods of sleep/rest.</p>	<p>Rest and sleep are vital for cardiac healing (balance between oxygen demand and consumption) and can enhance coping with stress and discomfort.</p>
<p>Identify/encourage use of behaviors such as guided imagery, distractions, visualizations, deep breathing.</p>	<p>Relaxation techniques aid in management of stress, promote sense of well-being, may reduce analgesic needs, and promote healing.</p>
<p>Tell patient that it is acceptable, even preferable, to request analgesics as soon as discomfort becomes noticeable.</p>	<p>Presence of pain causes muscle tension, which can impair circulation, slow healing process, and intensify pain.</p>
<p>Medicate before procedures/activities as indicated.</p>	<p>Patient comfort and cooperation in respiratory treatments, ambulation, and procedures (e.g., removal of chest tubes, pacemaker wires, and suture removal) are facilitated by maximum analgesic blood level.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Pain Management (NIC)</p> <p>Independent</p> <p>Investigate reports of pain in unusual areas (e.g., calves of legs, abdomen) or vague complaints of discomfort, especially when accompanied by changes in mentation, vital signs, respiratory rate.</p> <p>Note reports of pain and/or numbness in ulnar area (fourth and fifth digits) of the hand, often accompanied by pain/discomfort of the arms and shoulders. Tell patient that the problem usually resolves with time.</p> <p>Collaborative</p> <p>Administer medications as indicated, e.g., propoxyphene and acetaminophen (Darvocet-N), acetaminophen and oxycodone (Tylox), and/or ketorolac (Toradol).</p>	<p>May be an early manifestation of developing complication, e.g., thrombophlebitis, infection, gastrointestinal dysfunction.</p> <p>Indicative of a stretch injury of the brachial plexus as a result of the position of the arms during surgery. No specific treatment is currently useful.</p> <p>Usually provides for adequate control of pain and inflammation, and reduces muscle tension, which improves patient comfort and promotes healing.</p>

<p>NURSING DIAGNOSIS: Role Performance, ineffective</p> <p>May be related to</p> <p>Situational crisis (dependent role)/recuperative process Uncertainty about future</p> <p>Possibly evidenced by</p> <p>Delay/alteration in physical capacity to resume role Change in usual role or responsibility Change in self/others' perception of role</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Psychosocial Adjustment: Life Change (NOC)</p> <p>Verbalize realistic perception and acceptance of self in changed role. Talk with SO about situation and changes that have occurred. Develop realistic plans for adapting to perceived role changes.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Role Enhancement (NIC)</p> <p>Independent</p> <p>Assess patient role in family constellation. Identify concerns about role dysfunction/interruption, e.g., recuperation, health-illness transitions.</p>	<p>Helps to know patient responsibilities and how illness affects this role. Dependent role of patient provokes anxiety and concern about how patient will be able to manage usual role responsibilities.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Role Enhancement (NIC)</p> <p>Independent</p> <p>Assess level of anxiety, patient's perception of degree of threat to self/life.</p> <p>Note cultural factors affecting role changes.</p> <p>Maintain positive attitude toward patient, providing opportunities for patient to exercise control as much as possible.</p> <p>Assist patient/SO to develop strategies for dealing with changes, e.g., shift responsibilities to other family members/friends or neighbors, acquire temporary assistance (homemaker/yardwork), investigate avenues for financial assistance.</p> <p>Acknowledge reality of grieving process related to change in usual role (even if only temporary) and help patient deal realistically with feelings of anger and sadness.</p>	<p>Information provides baseline for identifying/individualizing plan of care.</p> <p>Cultural expectations regarding male/female illness role can determine how patient/SO reacts to and deals with current situation and may affect future adaptation to perceived changes.</p> <p>Helps patient accept changes that are occurring and begin to realize that control over self/situation is possible.</p> <p>Planning for changes that may occur/be required promotes sense of control and accomplishment without loss of self-esteem.</p> <p>Cardiac surgery constitutes a dramatic point in patient's life, which will never be the same again. These feelings need to be recognized and dealt with by patient/family to move forward.</p>

<p>NURSING DIAGNOSIS: Breathing Pattern, risk for ineffective</p> <p>Risk factors may include</p> <ul style="list-style-type: none"> Inadequate ventilation (pain/muscular weakness) Diminished oxygen-carrying capacity (blood loss) Decreased lung expansion (atelectasis or pneumothorax/hemothorax) <p>Possibly evidenced by</p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Respiratory Status: Ventilation (NOC)</p> <ul style="list-style-type: none"> Maintain a normal/effective respiratory pattern free of cyanosis and other signs/symptoms of hypoxia with breath sounds equal bilaterally, lung fields clearing. Display complete reexpansion of lungs with absence of pneumothorax/hemothorax.
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ACTIONS/INTERVENTIONS	RATIONALE
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Respiratory Monitoring (NIC)	
Independent	
Evaluate respiratory rate and depth. Note respiratory effort, e.g., presence of dyspnea, use of accessory muscles, nasal flaring.	Patient responses are variable. Rate and effort may be increased by pain, fear, fever, diminished circulating volume (blood or fluid loss), accumulation of secretions, hypoxia, or gastric distension. Respiratory suppression (decreased rate) can occur from excessive use of narcotic analgesics. Early recognition and treatment of abnormal ventilation may prevent complications.
Auscultate breath sounds. Note areas of diminished/absent breath sounds and presence of adventitious sounds, e.g., crackles or rhonchi.	Breath sounds are often diminished in lung bases for a period of time after surgery because of normally occurring atelectasis. Loss of active breath sounds in an area of previous ventilation may reflect collapse of the lung segment, especially if chest tubes have recently been removed. Crackles or rhonchi may be indicative of fluid accumulation (interstitial edema, pulmonary edema, or infection) or partial airway obstruction (pooling of secretions).
Observe chest excursion. Investigate decreased expansion or lack of symmetry in chest movement.	Air or fluid in the pleural space prevents complete expansion (usually on one side) and requires further assessment of ventilation status.
Observe character of cough and sputum production.	Frequent coughing may simply be throat irritation from operative endotracheal tube (ET) placement or can reflect pulmonary congestion. Purulent sputum suggests onset of pulmonary infection.
Inspect skin and mucous membranes for cyanosis.	Cyanosis of lips, nailbeds, or earlobes or general duskiness may indicate a hypoxic condition due to heart failure or pulmonary complications. General pallor (commonly present in immediate postoperative period) may indicate anemia from blood loss/insufficient blood replacement or RBC destruction from cardiopulmonary bypass pump.
Elevate head of bed, place in upright or semi-Fowler's position. Assist with early ambulation/increased time out of bed.	Stimulates respiratory function/lung expansion. Effective in preventing and resolving pulmonary congestion.
Encourage patient participation/ responsibility for deep-breathing exercises, use of adjuncts, and coughing, as indicated.	Aids in reexpansion/maintaining patency of small airways, especially after removal of chest tubes. Coughing is not necessary unless wheezes/rhonchi are present, indicating retention of secretions.
Reinforce splinting of chest with pillows during deep breathing/coughing.	Reduces incisional tension, promotes maximal lung expansion, and may enhance effectiveness of cough effort.
Explain that coughing/respiratory treatments will not loosen/damage grafts or reopen chest incision.	Provides reassurance that injury will not occur and may enhance cooperation with therapeutic regimen.
Encourage maximal fluid intake within cardiac reserves.	Adequate hydration helps liquefy secretions, facilitating expectoration.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Respiratory Monitoring (NIC)</p> <p>Independent</p> <p>Medicate with analgesic before respiratory treatments, as indicated.</p> <p>Record response to deep-breathing exercises or other respiratory treatment, noting breath sounds (before/after treatment), cough/sputum production.</p> <p>Investigate/report respiratory distress, diminished or absent breath sounds, tachycardia, severe agitation, drop in BP.</p> <p>Collaborative</p> <p>Review chest x-ray reports and laboratory studies (ABGs, Hb) as indicated.</p> <p>Assist with use of incentive spirometer.</p> <p>Administer supplemental oxygen by cannula or mask, as indicated.</p> <p>Assist with reinsertion of chest tubes or thoracentesis if indicated.</p>	<p>Allows for easier chest movement and reduces discomfort related to incisional pain, facilitating patient cooperation with/effectiveness of respiratory treatments.</p> <p>Documents effectiveness of therapy or need for more aggressive interventions.</p> <p>Although not a common complication, hemothorax/pneumothorax may occur following removal of the chest tubes and requires prompt intervention to maintain respiratory function.</p> <p>Monitors effectiveness of respiratory therapy and/or documents developing complications. A blood transfusion may be needed if blood loss is the reason for respiratory hypoxemia.</p> <p>Used to maximize lung inflation, reduce atelectasis, and prevent pulmonary complications.</p> <p>Enhances oxygen delivery to the lungs for circulatory uptake, especially in presence of reduced/altered ventilation.</p> <p>Reexpands lung by removal of accumulated blood/air and restoration of negative pleural pressure.</p>

<p>NURSING DIAGNOSIS: Skin Integrity, impaired</p> <p>May be related to Surgical incisions, puncture wounds</p> <p>Possibly evidenced by Disruption of skin surface</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Wound Healing: Primary Intention (NOC) Demonstrate behaviors/techniques to promote healing, prevent complications. Display timely wound healing.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Incision Site Care (NIC)</p> <p>Independent</p> <p>Inspect all incisions. Evaluate healing progress. Review expectations for healing with patient.</p> <p>Suggest wearing soft cotton shirts and loose-fitting clothing, leaving incisions open to air as much as possible, covering/padding portion of incisions as necessary.</p> <p>Have patient shower in warm water, washing incisions gently. Tell patient to avoid tub baths until approved by physician.</p> <p>Encourage elevation of legs when sitting up in chair.</p> <p>Review normal signs of healing, e.g., itching along wound line, bruising, slight redness, scabbing. Instruct to watch for/report to physician places in incision that do not heal; reopening of healed incision; any drainage (bloody or purulent); localized area that is swollen with redness, feels increasingly painful, and is hot to touch; temperature greater than 101.5°F (38.6°C) for longer than 24 hr.</p> <p>Promote adequate nutritional and fluid intake.</p>	<p>Healing begins immediately, but complete healing takes time. Chest incision heals first (minimal muscle tissue), but donor site incision (when saphenous vein is used) requires more time (more muscle tissue, longer incision, slower circulation). As healing progresses, the incision lines may appear dry, with crusty scabs. Underlying tissue may look bruised and feel tense, warm, and lumpy (resolving hematoma).</p> <p>Reduces suture line irritation and pressure from clothing. Leaving incisions open to air promotes healing process and may reduce risk of infection.</p> <p>Keeps incision clean, promotes circulation/healing. <i>Note:</i> “Climbing” out of tub requires use of arms and pectoral muscles, which can put undue stress on sternotomy.</p> <p>Promotes circulation, reduces edema to improve tissue healing.</p> <p>Helps patient understand expected progression of healing and recognize signs of complications/nonhealing requiring further evaluation/intervention. <i>Note:</i> Incisional problems rank second behind chest pain as cause of readmission post CABG. Leg wound complications most often occur on or about the 10th postoperative day.</p> <p>Helps maintain good circulating volume for tissue perfusion and meets cellular energy requirements to facilitate tissue regeneration/healing process.</p>
<p>Collaborative</p> <p>Obtain specimen of wound drainage as indicated.</p>	<p>If infection occurs, local and systemic treatments may be required, e.g., peroxide/saline/Betadine soaks, antibiotic therapy.</p>

NURSING DIAGNOSIS: Knowledge, deficient [Learning Need] regarding condition,

postoperative care, self-care, and discharge needs

May be related to

Lack of exposure/recall
Information misinterpretation

Possibly evidenced by

Questions/requests for information
Verbalization of problem, statement of misconception
Inaccurate follow-through of instructions

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Knowledge: Disease Process (NOC)

Participate in learning process.
Assume responsibility for own learning.
Begin to look for information/ask questions.
Verbalize understanding of condition, prognosis, and potential complications.

Knowledge: Treatment Regimen (NOC)

Describe reasons for therapeutic actions.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Teaching: Disease Process (NIC)</p> <p>Independent</p> <p>Reinforce surgeon’s explanation of particular surgical procedure, providing diagram as appropriate.</p> <p>Incorporate this information into discussion about short- and long-term recovery expectations.</p> <p>Cardiac Care: Rehabilitation (NIC)</p> <p>Reinforce continuation of breathing exercises, incentive spirometry, and coughing with splinting incision.</p> <p>Discuss routine/prophylactic medications and OTC drug use. Stress importance of checking with physician before taking any drugs.</p>	<p>Provides individually specific information, creating knowledge base for subsequent learning regarding home management.</p> <p>Length of rehabilitation and prognosis are dependent on type of surgical procedure, preoperative physical condition, and duration/severity of complications. <i>Note:</i> Encephalopathy resulting in memory loss, psychosis, and cognitive impairment, is reported in up to 30% of patients following the use of cardiopulmonary bypass pump. Symptoms may persist for 6–7 months.</p> <p>Promotes alveolar ventilation, reducing risk of lung congestion.</p> <p>Dependent on type of valve replacement (i.e., synthetic) and presence of atrial fibrillation, anticoagulant therapy may be indicated. Also, antibiotic agent may be required when dental care is provided. Potential for drug interactions must be considered before adding therapeutic agents to regimen. <i>Note:</i> Using herbal products (e.g., ginkgo biloba, garlic, vitamins) can alter coagulation and have an adverse effect when taken with anticoagulants.</p>

ACTIONS/INTERVENTIONS	RATIONALE
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<p>Cardiac Care: Rehabilitation (NIC)</p> <p>Independent</p> <p>Review prescribed cardiac rehabilitation/exercise program and progress to date. Assist patient/SO to set realistic goals.</p> <p>Encourage participation in home routines, e.g., self-care, cooking. Suggest alternating rest periods with activity and light tasks with heavy tasks. Avoid heavy lifting, isometric/strenuous upper-body exercise.</p> <p>Problem-solve with patient/SO ways to continue progressive activity program during temperature extremes and high wind/pollution days, e.g., walking predetermined distance within own house or local indoor shopping mall/exercise track.</p> <p>Schedule rest periods and short naps several times a day.</p> <p>Reinforce physician's time limitations about lifting, driving, returning to work, resuming sexual activity, and exercising that involves upper extremities.</p> <p>Discuss issues concerning resumption of sexual activity, e.g., comparison of stress of sexual intercourse with other activities:</p> <p>Position recommendations;</p> <p>Expectations of sexual performance;</p> <p>Appropriate timing, e.g., avoid sexual intercourse following heavy meal, during periods of emotional distress, when patient is fatigued/exhausted;</p>	<p>Individual capabilities and expectations depend on type of surgery, underlying cardiac function, and prior physical conditioning. <i>Note:</i> Obesity is a predictor of hospital readmission and may require additional interventions.</p> <p>Prevents excessive fatigue/overexhaustion. <i>Note:</i> Strenuous use of arms can place undue stress on sternotomy.</p> <p>Having a plan forestalls giving up exercise because of interferences such as weather.</p> <p>Rest and sleep enhance coping abilities, reduce nervousness (common in this phase), and promote healing.</p> <p>These restrictions are present until after the first postoperative office visit for assessment of sternum healing.</p> <p>Concerns about sexual activity often go unexpressed, but patients usually desire information about what to expect. In general, patient can safely engage in sex when activity level has advanced to point at which patient can climb two flights of stairs (which is about the same amount of energy expenditure).</p> <p>Patient should avoid positions that restrict breathing (sexual activity increases oxygen demand and consumption). Patient with sternotomy should not support self or partner with arms (breastbone healing, support muscles stretched).</p> <p>Impotence appears to occur with some regularity in postoperative cardiac surgery patients. Although etiology is unknown, condition usually resolves in time without specific intervention. If situation persists, may require further evaluation.</p> <p>Timing of activity may reduce occurrence of complications/angina.</p>
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<p>ACTIONS/INTERVENTIONS</p> <p>Cardiac Care: Rehabilitation (NIC)</p>	<p>RATIONALE</p>
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<p>Independent</p> <p>Pharmacological considerations.</p> <p>Identify services/resources available after discharge. Provide telephone contact number/schedule follow-up calls as appropriate. Include referral names for home care services, as indicated.</p>	<p>Some patients may require antianginal medications (prophylactically) before sexual activity.</p> <p>Facilitates transition to home; provides for ongoing monitoring, continuation of prescribed therapies, opportunity to discuss concerns and alleviate anxiety.</p>
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following discharge from care setting (dependent on patient's age, physical condition/presence of complications, personal resources, and life responsibilities)

Activity intolerance—generalized weakness, sedentary lifestyle.

Skin/Tissue Integrity, impaired—surgical incisions, puncture wounds.

Home Maintenance, impaired—altered ability to perform tasks, inadequate support systems, reluctance to request assistance.

Infection, risk for—broken skin, traumatized tissue, invasive procedures, decreased hemoglobin.

Self-Care deficit—decreased strength and endurance, discomfort.

Role Performance, ineffective—situational crisis/recuperative process, uncertainty about future.