Chapter

30

Responding to the Needs of the Perioperative Client

Life's not just living, it's living in health.

—Guterman (1960)

COMPETENCIES

1. Discuss the three phases of the perioperative experience in relation to the client's expected outcomes and the major functional roles of the nurse.
2. Assess the physiological, psychological, social, cultural, spiritual, and age-related aspects of the perioperative client's health status.
3. Recognize sociocultural and ethical factors that affect decision making in planning care with the perioperative client.
4. Demonstrate an awareness of age-related functions and values when assessing and teaching clients.
5. Plan, implement, and evaluate the nursing care outcomes for perioperative clients in various health care settings.
6. Document nursing interventions that achieve the individualized expected outcomes for perioperative clients.
7. Describe essential components of discharge teaching for the perioperative client.

KEY TERMS

anesthesia
arthroplasty
continuous passive motion (CPM) device
Cullen's sign
extubation
incentive spirometers
intraoperative
intubation
lock-out interval
malignant hyperthermia
patient-controlled analgesia (PCA)
perioperative
pneumatic compression device
postoperative
preoperative
pulse oximeter
transcutaneous electrical nerve stimulation (TENS)
urgency

Perioperative refers to the management and treatment of the client during the three phases of surgery: preoperative, intraoperative, and postoperative. The three perioperative phases are designated by time intervals, interventions, and settings, using the word roots of *pre*—before; *intra*—during, and *post*—after. **Preoperative** (before surgery) refers to the time interval that begins when the decision is made for surgery until the client is transferred to the operating room (OR). The **intraoperative** (during surgery) phase begins when the client is transferred to the OR and ends with client transfer to a postanesthesia care unit (PACU). When the client leaves the OR and is taken to a PACU, the **postoperative** (after surgery) phase begins; this phase continues until the client is discharged from the care of the surgeon.

Changes have occurred in perioperative services as a result of advances in technology (such as lasers) and limited resources such as cost-containment measures in health care. These changes have challenged health care providers to be more responsive and cost-effective in delivering perioperative services.

Surgery is a major source of a hospital's income. Although major surgical interventions still occur in the hospital setting, the 1980s introduced a trend to perform surgery in ambulatory settings. Many of the services of the hospital's perioperative departments are now performed in outpatient settings. This change has had a positive impact on decreasing health care costs related to surgery. At the same time, health care providers are challenged to work in greater collaboration to decrease the client's length of stay in the hospital, increase satisfaction with the services, and prevent complications.

Ambulatory surgery clinics (free-standing facilities) also began in the 1980s as an outgrowth of federally regulated reforms from the Health Care Financing Administration (HCFA). HCFA's goal in health care reform was to decrease inpatient costs of services. Except for inpatient hospitalization, ambulatory surgery clinics provide all the services offered by hospitals.

In 1989, HCFA developed a listing of urgent and elective surgeries that require preauthorization for Medicare clients. Preauthorization means the surgery must be approved before surgery is performed to ensure that Medicare and other third-party payers will reimburse the facility for incurred surgical costs.

SURGICAL INTERVENTIONS

Surgery is performed to correct an anatomical or physiological defect or to provide therapeutic interventions. Surgeries are categorized according to the degree of **urgency** (timely intervention of surgery):

1. Emergency surgery requires immediate intervention to sustain life.
2. Urgent surgery dictates intervention as necessary to maintain health in situations that are not life-threatening.
3. Elective surgery is usually performed at a time convenient to the client, with the delay presenting no physiological harm.

Once the degree of urgency is established, the reason for performing the surgical intervention is categorized according to the expected outcome (see Table 30-1).

TABLE 30-1
Surgical Interventions Based on Expected Outcomes

Intervention	Expected Outcome
Diagnostic/exploratory	Determine the origin of presenting symptoms and extent of a disease process (e.g., biopsy)
Reconstructive	Correct a disease process or improve cosmetic appearance (e.g., arthroplasty and rhinoplasty)
Curative	Repair or remove a diseased organ or restore normal physiologic functioning (e.g., amputation or aneurysm repair)
Palliative	Decrease the spread of the disease process to prolong life or to alleviate pain (e.g., colostomy or partial tumor removal)
Transplant	Remove diseased tissue or organ and replace with functioning tissue or organ (e.g., kidney)

In a true emergency, saving the client's life is the primary goal. Stat blood work, including a type and crossmatch, is performed while the client and the operating room are prepared for the surgery. Urgent and elective surgeries allow the client and physician time to discuss the setting and scheduling of the surgery.

SETTING

Ambulatory care centers and physician offices are the usual settings for minor surgical procedures, such as removal of skin lesions and laparoscopy for inspection and biopsy. Outpatient surgery areas (one-day surgery centers or free-standing ambulatory clinics) provide the client and physician with alternative services for urgent and elective surgeries.

Outpatient surgical units focus on the needs of the client and strive to expedite the rendering of services with a preadmission visit. Preauthorization documents for Medicare or third-party insurance payers should be processed and approved before the preadmission visit.

During the preadmission visit, the nurse and anesthetist perform the preoperative assessment and initiate teaching. Diagnostic tests are performed in the outpatient surgical unit as opposed to the traditional process of having a client go to the various hospital departments for testing. Performing diagnostic testing in this fashion promotes a sense of caring for the client's needs and decreases the preadmission time.

On the day of surgery, clients who have been preadmitted go directly to an outpatient surgical unit, where they are prepared for surgery. Family members are encouraged to remain with the client while the client awaits transfer to the operative area.

Perioperative care is initiated for the hospitalized client when the decision is made for surgery. The client is reassessed and the nurse collaborates with the client in planning the care. Client and family teaching is begun as soon as possible to allow time to reinforce the teaching.

Preparing a client for a surgical procedure requires the collaboration of many professionals. Specific role responsibilities focus on assessment, client and family teaching, and interventions to promote client achievement of expected outcomes.

PERIOPERATIVE MANAGEMENT OF CARE

Effective perioperative management is directed by a multidisciplinary team in accordance with recognized standards of care and individualized expected client outcomes. Institutional protocol, which defines how procedures will be performed, is initiated in the preoperative phase and continues throughout the othe phases.

Each member of the health care team (surgeon, anesthetist, and nurse) has a specific role and responsibility toward the perioperative client. Collaboration between all health care providers is essential in planning client care. "Collaboration means that people with different areas of expertise are working as equals to define issues, design solutions, and achieve high quality outcome" (Rubenfeld & Scheffer, 1999, p. 352).

Surgeon Responsibilities

Physicians are credentialed by health care facilities to perform surgery. The surgeon is the primary physician the nurse communicates with regarding client care needs. Before surgery, the surgeon:

- Determines the need for the surgical intervention on the basis of the client's medical diagnosis and findings from the medical history and physical examination
- Determines the surgical setting in collaboration with the client
- Orders diagnostic tests only if directly correlated to the procedure or client diagnosis (see the accompanying display)
- Obtains client's consent for the surgical procedure
- Teaches the client about the outcomes and risks of the procedure

COMMON DIAGNOSTIC TESTS

- Urinalysis
- Complete blood count (CBC)
- Prothrombin time (PT) and partial thromboplastin time (PTT): Clients with known or suspected coagulation defects or to establish baseline information
- Chemistry profile: Clients with diseases that can alter electrolytes
- Electrocardiogram (ECG)
- Human immunodeficiency virus (HIV) testing: In accordance with agency policy
- Chest x-ray films: Clients over age 60 years, smokers, or those scheduled for general anesthesia

A major role function of the surgeon is *explaining and documenting evidence that the client understands the nature of the surgical procedure, the risk factors, and expected outcomes of the surgery.* This is done with a surgical consent form, the client's written permission to allow the surgeon to provide surgery. Many states, through statutory provisions, require physicians to perform and document client teaching. Once the client demonstrates understanding, the client signs the form, giving permission for the specific surgical intervention.

Anesthesia Provider Responsibilities

The anesthesia provider (anesthesiologist or certified registered nurse anesthetist) actively participates in each perioperative phase. The main role of the

anesthesia provider is to ensure client safety relative to the administration of anesthesia. The anesthesia provider:

- Obtains informed consent for anesthesia services
- Performs a preanesthesia evaluation that includes a thorough history, such as complications from previous anesthesia, and physical examination (American Association of Nurse Anesthetists [AANA], 1999a)
- Selects anesthetic agents
- Teaches the client regarding the anesthetic medications, their side effects, and risk factors
- Performs **intubation** (the insertion of an endotracheal tube into the bronchus through the nose or mouth to ensure an airway) and **extubation** (the removal of an endotracheal tube)

Most surgical procedures have predetermined anesthetic agents based on policy; if there is a variance from the norm, the anesthetist seeks agreement with the surgeon. The decision to use particular anesthetic agents is based on the client's health status, the surgical procedure, and anticipated duration of the surgery.

During the client interview, the anesthesiologist inquires about previous anesthesia experiences that can place the client at risk such as connective tissue abnormalities that suggest the presence of the autosomal dominant malignant hyperthermia (MH) gene. **Malignant hyperthermia** is a potentially lethal syndrome caused by a hypermetabolic state that is precipitated by the administration of certain anesthetic agents, for example, succinylcholine. When appropriate and feasible, medical records from previous surgeries are reviewed as part of the preanesthesia examination.

Nurse Responsibilities

The Association of periOperative Registered Nurses (AORN), formerly called the Association of Operating Room Nurses, promotes quality client care through the development of guidelines and standards of nursing practice. AORN has also developed the Perioperative Nursing Data Set (PNDS) to standardize nursing terminology regarding the perioperative client experience from preadmission until discharge to promote evidence-based practice. The PNDS is the first nursing language developed by a specialty organization that has been recognized by the American Nurses Association.

Perioperative nurses perform critical functions that vary with specific surgical procedures and the unique needs of individual clients to achieve positive client outcomes (Parker, Mimick, & Kee, 1999). Rubenfeld and Scheffer (1999) identified three guiding principles for implementing care based on professional standards: maintain client safety; provide effective care; and provide care as efficiently as possible. These principles are incorporated into each phase of the perioperative standards of nursing practice.

The nurse coordinates the client's care in a timely fashion to ensure safety and avoid surgical delays. Activities include:

- Scheduling the diagnostic tests
- Verifying that all the necessary documents (e.g., signed consent form) are on the client's medical record
- Reporting abnormal diagnostic results to the surgeon. Depending on the test results, treatment may be instituted to correct any abnormalities or the surgery may be canceled

A major part of the nurse's time is spent in preparing and teaching the client. Preoperative teaching is structured to provide planned educational activities to presurgical clients or family (significant others) according to assessed anxiety and fear levels, as discussed later in this chapter.

As technology becomes more sophisticated and health care resources become more limited, ethical issues have become more complex (Schroeter, 1999). Ethical dilemmas are inherent in perioperative nursing such as lack of respect for the client's dignity, withholding information or lying to clients, inadequate consents, incompetent health care providers, and do-not-resuscitate (DNR) orders. These issues have implications for the management of care in perioperative settings. Schroeter (1999) studied the aspects of informed consent and the impaired or incompetent colleague in the perioperative practice setting, and determined that perioperative nurses can accurately identify ethical situations occurring in the environment and that the majority of the participants reported that they would take action. The ethical competency of perioperative nurses is paramount to ensure that safe, competent, and ethical care is provided to all surgical clients.

ANESTHESIA

Anesthesia means the absence of pain. Anesthetic agents render a person insensible to pain during surgical, obstetric, and therapeutic or diagnostic procedures. Anesthesia requires a balancing of several agents to provide sedation, analgesia, muscle relaxation, and anesthesia for procedures of varying complexity. The types of anesthesia and their effects are listed in Table 30-2.

General Anesthesia

General anesthesia refers to the drug-induced state of analgesia, amnesia, muscle relaxation, and unconsciousness. General anesthesia represents a critical experience for surgical clients. The needs of these clients require that perioperative nurses possess knowledge of the basic principles of general anesthesia.

TABLE 30-2
Effects of Anesthetic Agents

Type of Anesthesia	Effects	
General anesthesia	Expected result	Total unconscious state, placement of a tube into the trachea
	Technique	Intravenous injection or inhalation
	Risks	Mouth or throat pain, hoarseness, injury to mouth or teeth, awareness under anesthesia, injury to blood vessels, aspiration, pneumonia
Regional Anesthesia		
Spinal or epidural analgesic/anesthesia	Expected result	Temporary decreased sensation or loss of feeling and movement to lower part of the body
	Technique	Drug injected through a needle or catheter placed either directly into the spinal canal (spinal or subarachnoid) or immediately outside the spinal canal (epidural)
	Risks	Headache, backache, buzzing in the ears, convulsions, infection, persistent weakness, numbness, residual pain, injury to blood vessels, complete spinal
Major/minor nerve block	Expected result	Temporary loss of feeling or movement of a specific limb or area
	Technique	Drug injected near multiple nerves or a plexus (major) or into or around a nerve or small nerve group (minor) providing loss of sensation to the area of the procedure
	Risks	Infection, convulsions, weakness, persistent numbness, residual pain, injury to blood vessels
Intravenous regional anesthesia	Expected results	Temporary loss of feeling and movement of an extremity
	Technique	Drug injected into veins of arms or leg while using a tourniquet
	Risks	Infection, convulsions, persistent numbness, residual pain, injury to blood vessels

(Adapted with permission from the American Association of Nurse Anesthetists. [1999b]. *Informed consent in anesthesia.* Park Ridge, IL: Author.)

INHALATION GENERAL ANESTHETIC AGENTS

Volatile Liquids

- Halothane (Fluothane, Somnothane)
- Methoxyflurane (Penthrane)
- Enflurane (Ethrane)
- Isoflurane (Forane)

The common routes for administering general anesthetics are inhalation and parenteral; other routes used less frequently are oral and rectal. Inhalation agents are administered in the form of gases or as vapors of volatile liquids through an anesthesia delivery system and a face mask or endotracheal tube. Commonly used inhalation agents that can produce all of the elements of general anesthesia are listed in the accompanying display; these agents are absorbed by the lungs. Nitrous oxide (compressed gas) is both absorbed and eliminated by the lungs, whereas the percentage of volatile liquids varies in their excretion between the lungs and kidneys.

COMMON INTRAVENOUS AGENTS USED FOR GENERAL ANESTHESIA

- Barbiturates: methohexital sodium, thiamylal sodium, thiopental sodium
- Benzodiazepines: diazepam and midazolam
- Narcotics: alfentanil hydrochloride, fentanyl, and sufentanil citrate
- Neuromuscular blocking agents: atracurium bresylate, doxicurium chloride, gallamine triethiodide, metocurine iodide, mivacurium chloride, pancuronium bromide, pipecuronium bromide, succinylcholine chloride, tubocurarine chloride, and vecuronium bromide

Although anesthesia is administered parenterally, it takes several intravenous drugs to produce all of the elements of general anesthesia. Injectable agents used for induction or maintenance of anesthesia are from one of the following drug classifications: barbiturates, benzodiazepines, narcotics, and neuromuscular blocking agents. See the accompanying display for common drugs for each of these classifications.

Barbiturates provide a rapid induction of short duration and are therefore used for invasive diagnostic and obstetric procedures and minor surgery. When barbiturates are contraindicated, other short-acting agents are used: ketamine or a nonbarbiturate drug (etomidate or propofol). Neuromuscular blocking agents produce muscle relaxation required for select surgical procedures; these drugs vary in their duration of action.

The client's individualized plan for balanced anesthesia may involve the concurrent or sequential use of many agents. For instance, thoracic muscle relaxation that is required for lung surgery can be provided by intravenous administration of a neuromuscular blocking agent. During the surgery, various types of vapors and gases may also be administered with oxygen to provide anesthesia. For abdominal surgery, muscle relaxation can be achieved by injecting a local anesthetic into the cerebrospinal fluid; after the abdominal anesthesia level is established, a short-acting barbiturate may be infused to provide general anesthesia during the surgical procedure.

Although the incidence of drug toxicity in anesthesia is rare, clients need to be informed about these inherent risk factors. General anesthetic agents can induce anaphylactic reactions; the incidence is 1:4,500, with a mortality rate of 6%, according to Khrais and Ouellette (1995).

Regional Anesthesia

The increased use of balanced anesthesia for surgical procedures has made it increasingly important for perioperative nurses to be knowledgeable about regional and local anesthetic agents. Regional anesthesia blocks nerve impulse conduction to a specific area or region of the body to decrease intractable pain or to produce an anesthetic field without the loss of consciousness.

An analgesic/anesthesic state is obtained by injecting a local anesthetic solution along a specific nerve path (see the accompanying display for a list of commonly used local anesthetic agents). Regional anesthesia can be administered with or without sedation (refer to Table 30-2 for the various techniques used in administering regional anesthesia).

Local Anesthesia

Local anesthesia refers to use of an anesthetic agent that disrupts sensation at the nerve endings. The two techniques used for administering local anesthesia are topical and infiltration. Topical anesthesia is the direct application of local anesthetics to tissues in the form of ointments, lotions, solutions, or sprays. After the use of oral anesthetic solutions (e.g., viscous lidocaine), *fluids and foods must be withheld until the gag reflex returns.*

Infiltrate anesthesia refers to intradermal, subcutaneous, or submucosal injection to provide a circumscribed area of anesthesia. This technique provides a local nerve block that is used for suturing lacerations or extracting teeth.

COMMONLY USED LOCAL ANESTHETIC AGENTS

- Bupivacaine hydrochloride (Marcaine, Sensorcaine)
- Chloroprocaine (Nesacaine, Nesacaine MPF)
- Etidocaine hydrochloride (Duranest)
- Lidocaine hydrochloride (Xylocaine)
- Mepivacaine hydrochloride (Carbocaine, Polocaine)
- Procaine hydrochloride (Novocain)
- Tetracaine hydrochloride (Pontocaine)

PREOPERATIVE PHASE

The primary goal of preoperative nursing care is to place the client in the best possible condition for surgery through careful assessment and thorough preparation. Assessment of the client's status before surgery establishes baseline data to direct interventions throughout the perioperative phases. Each member of the health care team has identified functions relating to the assessment of the client's physiological, psychological, social, cultural, and spiritual status. *The findings from the client's assessment must be documented throughout the surgical experience.*

Assessment

Assessment of the perioperative client includes a nursing history and physical examination. A complete assessment is performed on the outpatient client during the preadmission visit. On the day of surgery, the nurse conducts a focused assessment to ensure current, accurate data.

During the assessment process, the nurse evaluates the client's level of anxiety and fear. Bulechek and McClosky (1995) describe these feelings:

- Anxiety is a vague, uneasy feeling whose source is often nonspecific or unknown to the client.
- Fear is a feeling of dread related to an identifiable source that the client validates.

Anxiety also has well-defined physiological changes, such as an increased heart rate, clammy hands, muscular tension (especially in the neck muscles), and behavioral manifestations, such as rapid speech and irritability.

Nursing History

The perioperative nursing history provides information relative to factors that can increase a client's risk or influence the expected surgical outcomes. Pertinent data are obtained from the client interview: medical history including family history of anesthesia complications (malignant hypertension); medications; allergies; age-related factors; social, cultural, and spiritual concerns; and psychologic status. See Chapter 6 for more details.

Nurses should conduct the interview in a quiet room, free from background noise. Many elderly clients have some degree of high-tone hearing loss (Eiseman, 1996), so it is necessary to speak in a strong, clear voice.

Clients who have difficulty comprehending the surgical procedure should have a responsible family member present during the interview. A third person can help clarify precisely what the nurse said and can interpret such instructions to other family members.

Medical History

The nurse reviews the client's medical record. The surgeon's history and physical findings provide pertinent data regarding the reasons for surgery. If the client was previously hospitalized, the nurse obtains the previous medical records to have available on the nursing unit. Hospitalization records are reviewed to gain an overview of the client's health status because preexisting medical conditions can increase the client's surgical risks.

During the interview, the nurse questions the client regarding past illnesses and the main reason for seeking surgical treatment. The client is asked to describe prior surgeries and their dates. Any complications from a previous surgery or anesthesia should be recorded.

It is important to note if the client has had prior blood transfusions or reactions. At this time the nurse can ascertain whether the client has objections to receiving blood or blood products or has made arrangements for blood replacement. Some clients prefer to donate their own blood in advance so that it can be held in reserve if the need for it arises during surgery. Family members or friends may also donate blood to decrease the cost to the client.

Medications

During the nursing history, the nurse needs to assess exactly what drugs the client has been taking. The client's response to questions about the use of alcohol, tobacco, "street drugs," prescription, over-the-counter drugs, and herbs should be documented because these substances have surgical implications.

DRUGS THAT PLACE SURGICAL CLIENTS AT RISK

- Aspirin: May increase bleeding
- Antidepressants: May lower blood pressure during anesthesia
- Bromide in medications (e.g., Sominex): Can accumulate and produce signs and symptoms of dementia
- Drugs with anticholinergic effects: Increase the potential for confusion
- Steroids: Suppress immunity
- Nonsteroidal anti-inflammatory medications: Increase the risk of stress ulcers and displace other drugs from blood proteins

Certain prescription drugs (antihypertensives, tranquilizers, steroids, and diuretics) can increase the client's anesthesia risks. Clients with chronic diseases are likely to be taking numerous medications that can cause complications during the perioperative period (see the accompanying display).

Herbs

Question clients regarding their use of herbal products and supplements as part of the preoperative assessment. Certain herbal products and supplements may place the client at risk if taken before surgery such as *Ephedra sinica* (Chinese ephedra or Ma Huang), St. John's wort, and Feverfew.

Ephedra can produce the same side effects of ephedrine such as increased blood pressure and heart rate, insomnia and anxiety. St. John's wort is used widely as a mild to moderate antidepressant because of its ability to inhibit monoamine oxidase (MAO). MAO inhibitors may interact with various types of anesthetic agents. Feverfew inhibits platelet aggregation and may affect the client's clotting time.

Although some herbal products may place the client at risk during surgery, other herbs such as *Bromelain* can reduce healing time and pain following various surgical procedures. Bromelain is obtained from the pineapple plant and refers to a group of sulfur-containing enzymes that digest protein (proteolytic enzymes or proteases). Murray (1995) addresses a double-blind study of persons undergoing oral surgery; bromelain reduced edema, inflammation, and pain when taken preoperatively.

Allergies

Allergies and sensitivities to foods, drugs, or other substances should be documented on the assessment record. Of special importance is questioning the client about allergies to iodine. Povidone-iodine, a common antiseptic, is used to prepare the skin for surgery. The nurse places a note regarding the client's allergies on the front of the chart to alert perioperative team members.

Age-Related Considerations

Age-related considerations are critical aspects of assessment (Eiseman, 1996). The client's age and developmental stage can influence the ability to cope with surgery. Age-related factors can also influence existing health care problems and the client's response to surgery. For instance, infants are at risk during surgical interventions because their physiological functions are immature. The infant's ability to respond to stress is also altered.

Morbidity and mortality rates for surgical clients over the age of 90 are much higher than for those in the 70 to 75 age group (Hogstel, 2001). Older clients may be fearful of death, especially if this is their first hospitalization or surgery. The risk of surgery for many older clients is complicated by chronic disease processes; more than 100,000 clients over 65 years of age die

postoperatively each year (Corey-Plett, 1995). Age-related risk factors for the older adult should be assessed on an individual basis. Hogstel (2001) contends that age should no longer be a major factor in deciding whether or not surgery should be performed to prolong life or to provide comfort for elderly clients. When elderly clients are adequately prepared for a noncomplicated surgical procedure, they can tolerate many types of surgeries as well as younger clients (Cory-Plett, 1995; Hogstel, 2001). However, studies have shown that, when elderly clients are subjected to emergency surgeries or long, complicated surgeries, their decreased ability to adapt to physical and psychological stress may have a negative surgical outcome (Eiseman, 1996). Since 50% of all emergency surgeries are on clients over 65 years of age (Eiseman, 1996), nurses need to provide psychological support to assist the elderly client in coping with the stress of surgery.

Social and Cultural Considerations

Data relative to the client's social and cultural orientation are incorporated into care. These data assist the nurse in selecting appropriate teaching methods. Many facilities provide interpreters to prevent language from being a communication barrier.

Cultural beliefs can influence a client's perception of surgery. Listen to a client's concerns expressed during the interview. Surgeries that cause changes in body image can alter self-esteem. The client may worry about being sexually attractive or active after surgery. The nurse may initiate discussion regarding sexual outcomes of surgery; encourage the client to verbalize fears in order to increase adaptive coping.

Spiritual Considerations

Clients must be provided the opportunity to express their spiritual values and beliefs. Religious beliefs are discussed and incorporated into the client's plan of care. A client may ask to see a member of the clergy before surgery. The beliefs of the client should be respected. The client has the right to refuse certain types of interventions. For example, some religions do not allow the administration of blood products as treatment. When the client indicates that religious beliefs prevent blood administration, the health care team should identify alternative methods of treatment and discuss these with the client during the preoperative phase. Collaborating with the client preoperatively helps prevent ethical dilemmas from arising during the other perioperative phases in the event that the client loses a large quantity of blood.

Psychosocial Status

A psychosocial evaluation is conducted with the client and family by assessing their degree of understanding and anxiety regarding the surgical procedure (see the accompanying display). Assess the client's knowledge of the surgical procedure and the expected surgical outcomes. It is important that the client express agreement with the surgical plan of care.

ASSESSMENT QUESTIONS: PSYCHOSOCIAL STATUS

- Why are you having surgery?
- When did this problem start?
- What do you think caused this problem?
- Has this caused any problems with your relationships with others?
- Has your problem prevented you from working?
- Are you able to take care of your own needs?
- Are you experiencing any discomfort or pain?
- What are you expecting from this surgery?
- Is there anything that you do not understand regarding your surgery?
- Are you worried about anything?
- Will someone be available to assist you when you return home?

Physical Assessment

The nurse assesses the client's physiological health status by performing either a partial or a complete physical examination. The decision to conduct a partial or complete physical depends on the client's health status relative to the surgical procedure, the setting, and the amount of time available to gather pertinent data.

The nurse in an outpatient setting, on the day of surgery, usually performs a partial examination. The client's medical record should be reviewed to ensure that a complete nursing physical was conducted during the preadmission visit. The nurse should focus on obtaining pertinent assessment data to establish baseline parameters for prioritizing the client's care. The client's neurologic assessment is integrated throughout the interview and physical examination.

THINK ABOUT IT

Responding to Client Altered Self-Image

As a student nurse, how can you assist the client in verbalizing fears about alterations in body image that have sexual implications? A 30-year-old woman is admitted for removal of a cancerous breast. Her mother died at age 30 from breast cancer. The client has been married for 5 years and has a 3-week-old infant. Her husband is with her. You have to admit and interview the client for the nursing history. How would you approach the medical diagnosis? Would you feel comfortable helping this client verbalize her fears?

General Survey

Observe the client's condition starting with the initial contact. For instance, if the client walks into the unit, observe and note the client's gait; note if assistance is needed with ambulation. Does the client need assistance when transferred to a bed? When shaking the client's hand, note the strength and sensation of the hand grasp and the skin temperature. Coldness of the hand may indicate impaired circulation.

During the interview, assess the level of consciousness and orientation. Does the client respond appropriately to your questions? Observe for signs of hearing impairment or loss of vision. Note if the client is wearing glasses.

Head and Neck

While talking with the client, assess if eye contact is maintained. Note the color of the sclera and inspect for drainage from the eyes. Inspect the general condition of the scalp, noting alopecia or seborrheic dermatitis. Inspect the oral cavity, check for any loose teeth, and assess the tongue and mucous membranes (note color and moisture). Observe the client's lips and tongue (especially if client has a history of cardiac disease). Note if the client has dentures.

Inspect the neck and verify the strength of the carotid pulses, one at a time; palpate jugular veins for distension. If the client is a child or has cancer, palpate the cervical lymph nodes. Assess for range of motion.

Upper Extremities

Palpate the client's brachial and radial pulses bilaterally; note the rate and character of each pulse. Check the capillary refill. Assess the skin; note the temperature, texture, and integrity. Assess for range of motion.

Anterior and Posterior Chest and Abdomen

Inspect and palpate the chest wall, noting the breathing pattern and expansion of the chest wall. Auscultate heart sounds and listen to anterior and posterior breath sounds; note crackles, gurgles, or wheezing.

Inspect the abdomen for distension and listen for bowel sounds in all four quadrants. Palpate the abdomen for rigidity, enlarged organs, or rebound tenderness.

Lower Extremities

Assess the length and position of each leg. Palpate the bilateral strength of femoral, popliteal, and pedal pulses, noting the rate and character of each pulse. Assess the skin; note the temperature, texture, integrity, and the presence of edema. Check the capillary refill. Inspect the bony prominences of the ankles and feet. Assess for strength and sensation by having the client bend the leg and push the foot against your hand. Assess for range of motion. Clients scheduled for spinal anesthesia should be assessed for gross motor function and strength.

Nursing Alert

Spinal Anesthesia

Spinal anesthesia causes temporary paralysis of the lower extremities. Preoperative weakness or impaired movement of the lower extremities should be reported to nurses caring for clients recovering from spinal anesthesia; postoperatively this report prevents the recovery nurse from making the wrong decisions when full motor function fails to return.

The nurse documents on the medical record and communicates to the health care team all significant assessment data. This information establishes baseline parameters to direct decision making throughout the perioperative phases.

Nursing Process Highlight

ASSESSMENT

Mrs. Broussard, 69, was admitted to an outpatient surgical unit for a total hip replacement (**arthroplasty**). The surgeon explained the surgical procedure during her last office visit. Preauthorization has been granted for the surgery. Diagnostic testing, a comprehensive history and physical examination, and postoperative exercise instructions were performed during the preadmission visit. Mrs. Broussard has been suffering for 10 years with chronic degenerative arthritis. She has experienced increasing pain and loss of mobility in her left hip for the past 6 months.

- In collecting data from Mrs. Broussard during the focused assessment, what types of information are essential for the development of a plan of care for her on the day of surgery?
- Which baseline data should be obtained from Mrs. Broussard during the partial physical examination?
- What further data should be collected at this time?

Diagnosis

The nurse formulates nursing diagnoses based on an analysis of assessment data and the nature of surgery. Physical assessment findings are compared against diagnostic test results; for example, cardiovascular findings are analyzed with blood chemistry and ECG results.

Selection of the most appropriate nursing diagnosis should focus on the specific perioperative phase (see the accompanying display). The diagnosis may be pertinent to all three perioperative phases or to one or more phases.

For instance, as described in the Nursing Process Highlight, Mrs. Broussard is experiencing pain that is caused from the degenerative changes in the hip joint as a result of arthritis. Although the surgeon will remove the diseased joint, Mrs. Broussard will continue to experience pain. In fact, the pain may worsen for several weeks postoperatively (Barrows, 1995). The most appropriate diagnosis for Mrs. Broussard is *Pain*. Preoperatively, the pain is related to the degeneration of the hip joint; postoperatively, the pain is related to swelling at the surgery site.

Common nursing diagnoses for the preoperative client are *Deficient Knowledge* related to the surgery, *Anxiety,* and *Fear.* Clients and families view the perioperative experience differently on the basis of prior experiences and coping skills (Bulechek & McCloskey, 1995). Some clients are threatened; others consider the experience to be a challenge. Some clients are highly anxious, whereas others experience a moderate degree of anxiety. Besides the primary threat of surgery, clients also have to deal with separation from family and loss of independence.

Associated nursing diagnoses address the client's preexisting health condition. For instance, an associated diagnosis for Mrs. Broussard is *Impaired Physical Mobility* related to musculoskeletal impairment. This nursing diagnosis would be initiated preoperatively and throughout the perioperative experience.

Outcome Identification and Planning

The nurse develops goals with client-focused expected outcomes based on relevant nursing diagnoses. Nurses collaborate with other health care team members and the client in establishing the goals and outcomes. The overall goal is to protect the client from injury related to anesthesia and surgery. The plan of care directs the selection of specific nursing interventions that promote the client's achievement of expected outcomes, for example, client teaching.

The current health care system challenges the perioperative nurse to be responsive to surgical clients who may enter and exit the health care setting at various points and with different experiences (Bulechek & McCloskey, 1995). Some clients are admitted to the hospital the day of surgery, some the evening before; some have surgery as an outpatient. Some clients with general anesthesia may be discharged the day of surgery.

Discharge planning needs are incorporated into the plan of care on admission. The following considerations are included in discharge planning:

- Psychosocial and spiritual support systems and community resources
- Financial aspects of the illness
- The degree of illness or disability
- Rehabilitation
- Preventive care
- Client teaching needs

Some clients need the services of a home health agency on discharge. The perioperative nurse usually coordinates home care with the social worker.

Implementation

Preparing the client for surgery requires the nurse to perform multiple interventions within specific time constraints. However, the nurse must remain responsive to the client's needs, demonstrating a caring attitude (see Figure 30-1). Documentation tools are available to assist the nurse in providing safe, timely preoperative care (e.g., the consent form and preoperative checklist). Active planning and intervention are necessary to reduce the risk for complications (Eliopoulos, 1999).

Surgical Consent Form

Although surgeons are responsible for obtaining informed consent, nurses should verify that consent has been obtained before treatment begins. Consent is given only for the extent of action documented on the informed consent. Nurses can identify problems with consent when the client:

- Cannot explain the procedure or identify the risks
- Signed the form more than 30 days before surgery
- Had an unauthorized person sign the consent form
- Did not sign the consent form

Figure 30-1 The nurse prepares a client for surgery. While the nurse was performing preoperative assessment, the client demonstrated pain through facial expression. What implications might the client's pain have on the surgery? What actions should the nurse take, considering the potential effects on the client's perioperative experience?

PERIOPERATIVE NURSING DIAGNOSES

Preoperative Phase

Deficient Knowledge related to:

- Nature and purpose of the surgical procedure
- Preoperative preparation to decrease postoperative risks

Anxiety related to:

- Deficient knowledge of a new experience
- Inherent risk factors of the surgical procedure and anesthesia

Fear related to:

- The unknown
- Effects of surgery on economic and employment status

Intraoperative Phase

Risk for Perioperative Positioning Injury related to:

- Sensory/perceptual disturbances due to anesthesia
- Edema

Risk for Injury related to:

- Physical (equipment or sponge count)
- Environmental
- Positional

Risk for Infection related to:

- Invasive procedure
- Imbalanced nutrition

Hypothermia related to:

- Exposure to cool environment
- Decreased metabolic rate

Postoperative Phase

Ineffective Airway Clearance related to:

- Anesthesia (diminished cough reflex)
- Increased pulmonary congestion

Ineffective Breathing Pattern related to:

- Pain
- Decreased energy/fatigue

Ineffective Tissue Perfusion (Cardiopulmonary) related to:

- Anesthesia
- Position or immobility

Deficient Fluid Volume related to:

- Active fluid volume loss
- Inadequate fluid intake

Imbalanced Nutrition: Less Than Body Requirements related to:

- Anesthesia
- Surgical manipulation of intestines

(continues)

PERIOPERATIVE NURSING DIAGNOSES (continued)

Urinary Retention related to:

- Anesthesia
- Surgical manipulation of the bladder

Acute Pain related to:

- Surgical incision

Risk for Infection related to:

- Impaired skin integrity from surgical wound
- Deficient knowledge of wound or drainage tube care

Situational Low Self-Esteem related to:

- Altered body image, effects of surgery
- Dependence on others during recuperation from surgery

(From North American Nursing Diagnosis Association. [2001]. *Nursing diagnoses: Definitions & classification.* 2001–2002. Philadelphia: Author.)

The nurse should notify the surgeon in the event that any problems with consent are identified.

If the surgeon proceeds without appropriate consent, nursing administration should be notified and the nurse should make personal notations outside the medical record. This practice protects the nurse should the situation be brought to court. If the client reverses a decision and decides against surgery, the nurse is obligated to inform the surgeon in order to prevent unwanted treatment.

Preoperative Checklist

A checklist is a form that allows the nurse to insert a checkmark (√) beside symptoms or to fill in one or two words in answer to a cue or a question. Although some variations exist in how agencies format the preoperative checklist, the forms usually have similar content. Nursing activities are usually designated by time intervals: "night before surgery" and "day of surgery." Time designations help to prevent surgical delays that can increase the client's anxiety and the agency's costs. Table 30-3 presents a sample preoperative checklist.

Although clients in outpatient settings arrive the day of surgery, the nurse prepares the client's medical record the day before for necessary documentation as itemized in Table 30-3. This preparation ensures that assessment, diagnostic tests, and teaching were done on the preadmission visit and allows time to obtain missing information and to assess the need for reinforcement or reevaluation as necessary.

On the day of surgery, the nurse focuses on the immediate physical interventions to prepare the client for surgery. While admitting and preparing the client for surgery, the nurse uses this time to encourage the client to

TABLE 30-3
Preoperative Checklist

	CK (✓)	Comments	Nurse CK (✓)
COMPLETE NIGHT BEFORE SURGERY			
List allergies			
Procedure scheduled			
Surgical permit signed/witnessed			
History/physical on chart and/or dictated			
Pre-anesthetic evaluation done			
Able to state type and purpose of surgery			
Demonstrates ability to perform: Deep breathing, turning and coughing exercises			
Leg exercises			
PM care with shower or bath given			
Nail polish removed and make-up removed			
Old chart requested and obtained			
Type and crossmatch for ____units of blood			
Blood consent signed and witnessed			
Lab work a. CBC _____ b. UA ____			
Tonsillectomy and Adenoidectomy patients: a. __PTT b. ____PT c. ____Platelets			
If ordered by MD: a. EKG _____ b. Chest X-ray _____			
Add other lab work ordered (specify)			
Notify surgeon of abnormal lab work			
New progress note and physician order sheet on chart			
Weight			
NPO after midnight (if applicable)			
Signature of Nurse _____		Date _____	
COMPLETE DAY OF SURGERY			
Jewelry removed and secured with responsible party			
Dental prosthesis and contact lenses removed			
Hospital gown/cap on and undergarments removed			
Voided on call to surgery			
Indwelling catheter ordered and inserted			
Tampon removed			
Identiband and/or bloodband on/checked for accuracy			
Time _____ Pulse _____ Resp _____ B/P _____ Temp. _____			
Pre-op medicine given Medication _____ Time ____ AM PM			
Siderails up and bed to lowest level			
Patient instructed not to get out of bed without nursing assistance			
Addressograph plate/MAR's on chart			
VS 30 minutes after preop (if remains on unit)			
BP _____ P _____ R _____ T _____			
Old chart sent to surgery per request			
Surgical prep done and checked			
To surgery Time _____ Via _____			
Signature of Nurse _____		Date _____	
Holding Room Nurse Signature _____		Date _____	

verbalize any concerns. Allowance should be made for family members or significant others to remain with the client as the client awaits transfer to the operating room.

Client Teaching

Most clients view surgery as a threatening and anxiety-provoking event (Bulechek & McCloskey, 1995). Client teaching reduces anxiety. The risks of surgical complications are decreased when the client knows what to expect and receives instruction in postoperative exercises (Lindeman & Van Aernam, 1971).

Teaching the client and family members (significant others) is the responsibility of the multidisciplinary team. The nurse verifies that the client or family member is able to describe, in his or her own words, the reason for the surgery, what will be done during the surgical procedure, the side effects of the anesthetic agents, and the possible complications of both the surgery and the anesthesia.

The nurse plays a major role in relieving the client's anxiety by facilitating communication between physicians and the client and family and by reinforcing teaching regarding preoperative care. The client's family should be involved in the teaching sessions. Table 30-4 presents an overview to perioperative teaching activities with the client's expected outcomes.

Teaching aids (videotapes and pamphlets) are resources for client instruction during the perioperative processes. The nurse selects teaching materials based on the client's ability to read and understand. The nurse provides accurate, consistent information throughout the teaching process. The teaching aids must reinforce the verbal instructions of the nurse, anesthetist, and surgeon. Informational materials should explain what will happen in each of the perioperative areas (such as the holding area) to foster client cooperation. Refer to Chapter 13 for additional information on client teaching.

Types of Surgical Incisions

Nurses need to be knowledgeable about common surgical incisions to reinforce the surgeon's teaching and to answer the client's questions. Two main factors govern incisions: direction and location. Incisions may be vertical, horizontal, transverse, or oblique. Figure 30-2 illustrates and describes the location of common surgical incisions.

Postoperative Exercise Instruction

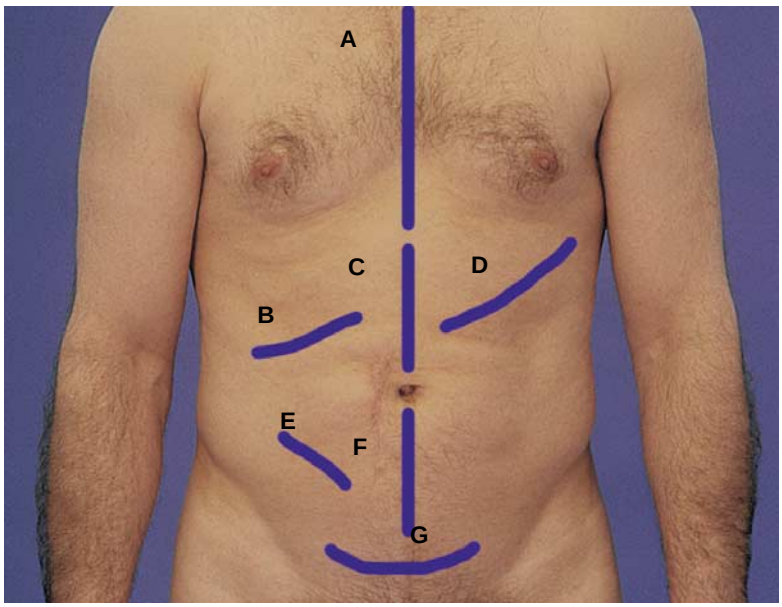
As early as 1941, nurses were challenged to participate in preoperative instruction (Bulechek & McCloskey, 1995). In 1983, Leventhal and his colleagues suggested that the effectiveness of existing preoperative instruction could be increased by assisting clients to assume self-regulation after surgery.

Preoperative teaching of postoperative exercises prepares the client physically and emotionally for the impending surgery (Bulechek & McCloskey, 1995; Eiseman, 1996). Language barriers, identified during assessment, are considered when teaching the client. The goal of instruction is to have the client demonstrate the performance of exercises while verbalizing why the exercises are used during the postoperative phase (Procedure 30-1).

Clients may experience their worst postoperative pain while coughing, deep breathing, and exercising. Clients with abdominal or chest surgery may avoid using muscles

TABLE 30-4
Preoperative Teaching Interventions and Expected Client Outcomes

Intervention	Expected Client Outcomes
Preparation activities	The client can: • Describe in own terms the purpose, risk factors, and outcomes of surgery and anesthesia. • Explain restrictions on food the evening before, identifying the time frame (6–8 hr) when no food and drink are allowed by mouth, NPO • Explain the meaning and purpose of skin and bowel preps. • Identify medications to be taken or omitted the day of surgery. • Describe activities that will occur in each perioperative area: holding area, fluids will be started in a vein; position on the operating room table; stay in recovery until awake, then be transferred to an intensive care unit.
Postoperative exercise instructions	• Demonstrate on two consecutive occasions postoperative exercises: deep breathing, coughing and pillow splinting, turning and proper body alignment; leg and foot exercises; and out-of-bed transfers.
Proper application and usage of medical devices	• For example, demonstrate proper use of incentive spirometer, application of TED hose, and self-medicating pain infusion pump.
Physical or environmental changes following surgery	• Demonstrate knowledge of the rehabilitation process: daily physical therapy for 2 weeks and a home health nurse for 10 days to administer prophylactic antibiotics and to monitor and refill the patient-controlled analgesia pump.



INCISION	LOCATION	ORGAN
A. Sternal Split	Begins at the top of the sternum and extends downward to the sternal notch.	Heart
B. Oblique Subcostal	Begins in the epigastric area and extends laterally and obliquely below the lower costal margin.	Right side: Gallbladder, Biliary Left side: Spleen
C. Upper Vertical Midline	Begins below the sternal notch and distally around the umbilicus.	Stomach, Duodenum, Pancreas
D. Thoracoabdominal	Begins midway between the xiphoid process and the umbilicus and extends across the seventh or eighth intercostal space, to the midscapular line.	Thorax, Heart
E. McBurney	Begins below the umbilicus, goes through McBurney's point, and extends toward the right flank.	Appendix
F. Lower Vertical Midline	Begins below the umbilicus, downward toward the symphysis pubis.	Bladder, Uterus
G. Pfannenstiel	Begins 1.5 inches above the symphysis pubis with a curved transverse cut across the lower abdomen.	Uterus, Fallopian tubes, Ovaries

Figure 30-2 Common Surgical Incisions

in the affected areas to take deep breaths or to cough effectively. Deep breathing and coughing facilitate removal of accumulated pulmonary secretions. Certain anesthetic agents depress the central nervous system, causing some clients to experience shallow respirations. Inhaled gases and oxygen have a direct drying effect on the respiratory mucosa, which increases the viscosity of mucus, making the secretions difficult to raise with coughing. These factors place the client at risk for respiratory complications (see the accompanying display).

To prevent respiratory complications, the nurse teaches clients to use a breathing technique in which the client turns, coughs, and deep breathes to achieve sustained max-

COMMON RESPIRATORY COMPLICATIONS AFTER SURGERY AND ANESTHESIA

- Pulmonary embolism: A blood clot that has moved to the lungs, causing pulmonary obstruction
- Atelectasis: Decreased ventilation caused from the pooling of secretions in dependent areas of the bronchiole
- Pneumonia: Inflammation of lung tissue
- Hypoxemia: Lowered oxygen level in the blood

PROCEDURE 30-1

Postoperative Exercise Instruction

Equipment

- Educational materials
- Tissues
- Disposable volume-oriented incentive spirometer
- Pillow
- Nonsterile gloves

Action	Rationale
1. Wash hands and organize equipment.	1. Reduces transmission of microorganisms and promotes efficiency.
2. Check the client's identification band.	2. Facilitates proper identification of client.
3. Place client in a sitting position.	3. Promotes full chest expansion.
4. Demonstrate deep breathing exercise.	4. Shows the client how to breathe deeply.
5. Have the client return demonstrate deep breathing:	5. Fosters learning.
• Place one hand on abdomen (umbilical area) during inhalation.	• Exerts counterpressure during inhalation.
• Expand the abdomen and rib cage on inspiration.	• Promotes maximum chest expansion.
• Inhale slowly and evenly through your nose until you achieve maximum chest expansion.	• Maintains full expansion of the alveoli.
• Hold breath for 2 to 3 seconds.	• Increases the pressure, preventing immediate collapse of the alveoli.
• Slowly exhale through your mouth until maximum chest contraction has been achieved.	• Promotes maximum chest contraction.
• Repeat the exercise three or four times; allow client to rest.	• Enforces learning.
6. The nurse demonstrates splinting and coughing.	6. Shows the client how to raise mucus secretions from the tracheobronchial tree.
7. Don gloves.	7. Reduces transmission of microorganisms.
8. Keep the client in a sitting position, head slightly flexed, shoulders relaxed and slightly forward, and feet supported on the floor.	8. Promotes full expansion of chest cage and use of accessory muscles to produce a deep, productive cough.
9. Have the client return demonstrate splinting and coughing:	9. Fosters learning.
• Have the client slowly raise head and sniff the air.	• Increases the amount of air and helps to aerate the base of the lungs.
• Have the client slowly bend forward and exhale slowly through pursed lips.	• Dries the tracheal mucosa as air flows over it; there is a slight increase in the carbon dioxide level, which stimulates deeper breathing.
• Repeat breathing two to three times.	• Loosens mucus plugs and moves secretions to the main bronchus.
• When the client is ready to cough, have client place a folded pillow against the abdomen;	• Elevates the diaphragm and expels air in a more forceful cough; supports the abdominal

(continues)

PROCEDURE 30-1 Postoperative Exercise Instruction (continued)

Action	Rationale
have the client grasp the pillow against the abdomen with clasped hands (see Figure 30-3).	muscles and reduces pain when coughing if the client has an abdominal incision.
• Have client take a deep breath and begin coughing immediately after inspiration is completed by bending forward slightly and producing a series of soft, staccato coughs.	• Removes secretions from the main bronchus.
• Have a tissue ready.	• Provides a tissue for sputum disposal.

Figure 30-3 Splinting

10. Instruct the client on the use of an incentive spirometer (see Figure 30-4). Have the client:	**10.** Reinflates the alveoli and removes mucus secretions.
• Hold a volume-oriented incentive spirometer upright.	• Promotes proper functioning of the device.

Figure 30-4 Incentive Spirometer

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action	Rationale
• Take a normal breath and exhale, then seal lips tightly around the mouthpiece; take a slow, deep breath to elevate the balls in the plastic tube, hold the inspiration for at least 3 seconds.	• Allows for greater lung expansion; holding the inspiration increases the pressure, preventing immediate collapse of the alveoli.
• The client simultaneously measures the amount of inspired air volume on the calibrated plastic tube.	• Encourages the client to do respiratory exercises.
• Remove the mouthpiece, exhale normally.	• Allows normal expiration.
• Take several normal breaths.	• Provides client the opportunity to relax.
• Repeat the procedure four to five times.	• Encourages sustained maximal inspiration and loosens secretions.
• Have the client cough after the incentive effort; repeat Step 9. Have a tissue ready.	• Facilitates removal of secretions.
• Have client clean mouthpiece under running water and place in clean container (disposable mouthpiece changed every 24 hours).	• Prevents transmission of microorganisms.
11. The nurse explains leg and foot exercises (Figure 30-5).	11. Elicits client cooperation.

A.

B.

C.

Figure 30-5 Leg Exercises

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action	Rationale
12. Instruct client to return demonstrate in bed:	12. Fosters learning of how to improve venous blood return:
• Have the client, with heels on bed, push the toes of both feet toward the foot of the bed until the calf muscles tighten; then relax feet. Pull the toes toward the chin, until calf muscles tighten; then relax feet (see Figure 30-5A).	• Causes contraction and relaxation of the calf muscles.
• With heels on bed, lift and circle both ankles, first to the right and then to the left; repeat three times, relax.	• Causes contraction and relaxation of the quadriceps muscles.
• Flex and extend each knee alternately, sliding foot up along the bed; relax (see Figure 30-5B, C).	• Causes contraction and relaxation of the quadriceps muscles.
13. The nurse shows the client how to turn in bed and get out of bed.	13. Elicits client cooperation.
14. Instruct the client who will have a left-sided abdominal or chest incision to turn to the right side of bed and sit up as follows:	14. Fosters learning how to turn and get out of bed without putting pressure on the incision line.
• Flex the knees.	
• With the right hand splint the incision with hand or small pillow.	
• Turn toward right side by pushing with the left foot and grasping the shoulder of the nurse or partial foot rail of the bed with the left hand.	
• Raise up to a sitting position on the side of the bed by using the left arm and hand to push down against the mattress (see Figure 30-6).	

Figure 30-6 Out-of-Bed Transfers

(continues)

PROCEDURE 30-1

Postoperative Exercise Instruction (continued)

Action	Rationale
15. Reverse instructions (use left side instead of right) for the client with a right-sided incision according to step 14.	15. Same as step 14.
16. Instruct clients with orthopedic surgery (e.g., hip surgery) how to use a trapeze bar.	16. Facilitates movement in bed without putting pressure on a leg or hip joint.

imum inspiration (SMI). SMI promotes the reinflation of the alveoli and the removal of mucus secretions.

Several devices help encourage clients to perform SMI exercises. The breathing devices, called **incentive spirometers**, measure the client's ventilatory volume and provide the user with a tangible reward for generating an adequate respiratory flow. Devices range from simple types, a Ping-Pong ball in a plastic tube, to sophisticated models (see Figure 30-4). When the client takes a deep breath, the ball moves upward and the amount of air is measured, making the results visible to the client.

Turning, deep breathing, coughing, and using spirometry prevent respiratory complications by:

- Promoting pulmonary circulation
- Promoting the exchange of gases by increasing lung compliance
- Facilitating the removal of mucus secretions from the tracheobronchial tree

Postoperatively the client is encouraged to move in bed and perform leg exercises as explained in Procedure 30-1. These exercises assist in preventing circulatory complications that can arise from anesthetic agents that depress the metabolic and heart rates; see the accompanying display. Early ambulation also increases respiratory function and the return of peristalsis.

COMMON CIRCULATORY COMPLICATIONS AFTER SURGERY AND ANESTHESIA

- Thrombophlebitis: Inflammation of a vein with the formation of a blood clot
- Thrombus: A blood clot in the circulatory system
- Embolus: A blood clot or air that moves in the circulatory system from its place of origin

Other Devices

Besides exercises, other devices are used to prevent postoperative circulatory complications, namely, antiembolism stockings and pneumatic compression. Another device, continuous passive motion (CPM), increases range of motion for immobilized clients after surgery. The CPM device also stimulates healing of articular cartilage by reducing swelling and adhesions.

Pain is managed with devices such as transcutaneous electrical nerve stimulation (TENS) and patient-controlled analgesia (PCA). The client needs to be informed about the use of such devices preoperatively to promote achievement of postoperative pain outcomes. All medical devices require a physician's order.

Antiembolism Stockings

Antiembolism stockings are elastic hose that compress leg veins to facilitate the return of venous blood. Depending on the surgical site, these stockings can be applied either preoperatively (e.g., abdominal surgery) or postoperatively (e.g., cardiac catheterization).

Elastic stockings are available in a variety of lengths, colors, and sizes to accommodate specific needs. One type of hose goes from the foot to the knee; another type goes from the foot to midthigh. Some stockings have partial openings on the foot to expose either the toes or heel so that the nurse can assess circulation.

The physician usually specifies the size and style of the hose and the frequency of application. If the physician does not indicate the size, the nurse uses a tape to measure the circumference of the calf and thigh and the length of the client's leg from the heel to the gluteal furrow. Stockings are removed for 20 to 30 minutes three times a day to allow for assessment and hygienic care. Assessment should include inspection for redness, palpation for tenderness or increased temperature, and testing for Homans' sign.

NURSING TIP

Client Safety

Instruct the client with antiembolism stockings to wear slippers or shoes to avoid slipping.

Pneumatic Compression Device

A **pneumatic compression device** provides intermittent compression cycles to the veins of the extremities to promote circulation. The device consists of either vinyl surgical sleeves that slide over each calf or Velcro-secured vinyl compression hoses that are applied under the thigh and leg with a knee-opening site that is placed over each popliteal area (see Figure 30-7). Both types of vinyl appliances have tube connectors that attach to an air pump machine. Observe the client applying the stockings, connecting the tubes to the air pump, and setting the correct pressure.

The air pump has an on-off switch and a dial to set the desired pressure. Turning on the pump initiates compression cycles, which cause the vinyl sleeves to automatically inflate and deflate. The nurse assesses the circulation to the extremities and placement of the stockings every 2 to 3 hours. The stockings are removed three times a day for 20- to 30-minute intervals to allow for hygiene care. Instruct the client on how to clean the vinyl stockings by disconnecting the stockings from the air pump and wiping off with tepid, soapy water.

Continuous Passive Motion Device

The **continuous passive motion (CPM) device** increases range of motion and stimulates healing of the articular cartilage by decreasing swelling and the formation of adhesions. It is used for clients with a nursing diagnosis of either *Impaired Physical Mobility* related to the surgical intervention or *Altered Tissue Perfusion* related to surgical intervention and immobility. The goal is to increase tolerance to the CPM device. The expected client outcome is to maintain maximum mobility of the joint.

Before initiating CPM, the nurse:

- Assesses the client's neurovascular status (skin color and temperature, pulses, capillary refill, sensation, and movement) of the extremity
- Applies the disposable soft goods to the CPM device according to the manufacturer's instructions

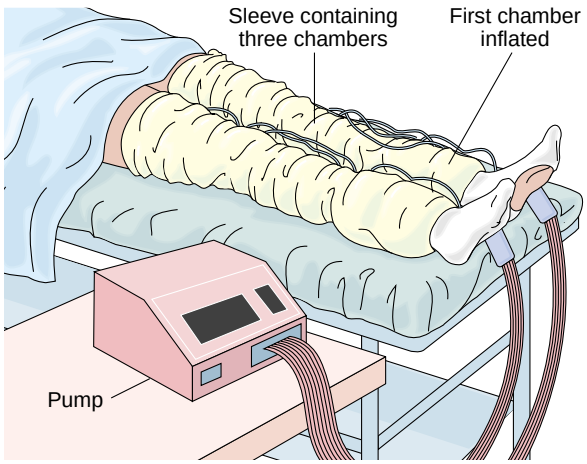


Figure 30-7 Pneumatic Compressed Device

NURSING CHECKLIST
Application of Antiembolism Stockings

- Wash hands and obtain the stockings, making sure the type and size are correct.
- Check the client's identification band.
- Show the client the stockings and explain the procedure to elicit cooperation. Make sure the client knows that the stockings are to be removed routinely and washed daily according to package directions.
- Provide for privacy. The client should be in a comfortable position to observe your technique while you apply one of the stockings.
- Wash, rinse, and dry the legs; stockings should only be applied to clean, dry skin.
- Talcum powder can be applied to the feet and legs to allow the stocking to move more easily over the skin.
- Turn the stocking inside out, except the foot portion.
- Place the foot of the stocking over the client's toes and on the foot; with your nondominant hand supporting the client's ankle, use your dominant hand to pull the heel pocket over the client's heel (see Figure 30-8).

Figure 30-8 When applying antiembolism stockings, support client's ankle while pulling stocking up.

- Slide the stocking up the leg, straightening as you apply; make sure that kinks and wrinkles are smoothed out to provide even pressure.
- Knee-length stockings should end 1 inch (2.5 cm) below the knees.
- If the stocking goes to midthigh, have the client flex the knee while you pull the stocking over the knee and thigh; the stocking should be 1 to 3 inches (2.5 to 7.5 cm) from the groin.
- The top of the stockings should not be folded over because additional constriction can occur.
- Have the client apply the other stocking, and assess the client's learning.
- Document client learning.

- Sets the machine to provide the degree of flexion and extension according to the physician's orders (e.g., 0° extension and 35° flexion)
- Adjusts the speed to control movement

When the device is readied, the client is positioned in the middle of the bed to accommodate the CPM unit. The nurse places the client's legs in the padded CPM device, making sure that the knees are at the hinged joint of the machine. The nurse measures the angle of flexion with a goniometer when the device has reached its greatest height. The client is taught how to operate the "go/stop" button and is instructed to report any discomfort or pain that occurs with motion.

Transcutaneous Electrical Nerve Stimulation Unit

A **transcutaneous electrical nerve stimulation (TENS)** unit controls pain by delivering electrical impulses to nerve endings that block the passage of pain signals from entering the dorsal spinal root. The TENS unit is effective in reducing pain and the amount of pain medication required to maintain comfort after surgery. The unit consists of a transmitter, lead wires, and electrodes (see Figure 30-9).

NURSING CHECKLIST
Instructing the Client on the Use of the TENS Device

- Place electrodes on the skin in the area of pain (e.g., on both sides of an incision).
- Connect the lead wires to the electrodes and portable battery-powered transmitter.
- Turn on and regulate for comfort by working with one lead at a time, beginning with a zero setting.
- Gradually increase the level of stimulation until the client feels discomfort, indicating that maximum stimulation has been achieved to block pain sensation; then reduce the volume slightly to prevent continued contraction of muscles.
- Repeat the same process with the other lead; this time allow the client to perform the actions.
- Ensure that the client knows to apply the electrodes to clean, unbroken skin.

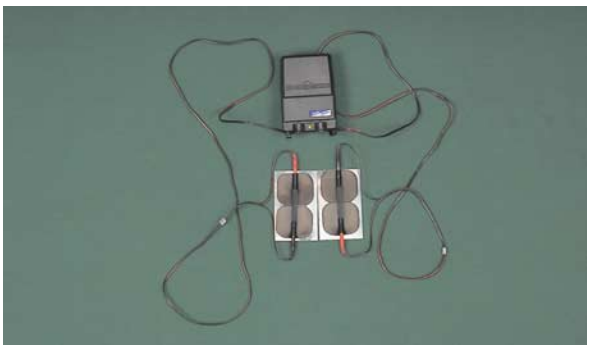


Figure 30-9 Transcutaneous Electrical Nerve Stimulation (TENS) Unit

Patient-Controlled Analgesia Pump

The **patient-controlled analgesia (PCA)** pump is a device that allows the client to control the delivery of intravenous or subcutaneous pain medication in a safe, effective manner. The client self-regulates the delivery of the medication. Several different types of PCA devices are available; the manufacturers provide instructions for setting up the infusion pump. The pain medication is contained within an infusion pump and set according to the physician's order: type and concentration of pain medication, loading dosage, and **lock-out interval** (minimum time allowed between doses for the client to self-medicate).

Before initiating the PCA pump, the nurse assesses the client's level of consciousness, orientation, reading ability, and ability to learn and comprehend. PCA is used most frequently in adolescents and adults. Family members are also taught how to recognize the signs of drug overdose in home-bound clients. Instruct the client on the PCA unit:

- To self-administer the medication as needed
- That the amount of the drug the machine delivers within a particular time frame is regulated to prevent overdose
- On the use of the control button

The advantages of a PCA unit are rapid pain relief, increased client satisfaction, and often the use of less medication than with the traditional intramuscular analgesia method.

Physical Preparation

Nursing activities related to the physical preparation of the client must be performed. These nursing functions are individualized to the client's needs as determined by health status and the type of surgical procedure scheduled. Activities such as restricting fluids, bowel preparation, or the removal of nail polish are done the evening before, regardless of the setting. Other activities occur the day of surgery in various perioperative settings.

Skin Preparation

The skin and hair follicles harbor microorganisms that can contaminate a surgical wound. The skin around the operative site is prepared to reduce the number of organisms present and to inhibit rebound growth. Preparation of the skin to reduce contamination of the surgical wound occurs in two phases. The evening before or the day of surgery, the client washes the area involved in the surgical procedure with an antimicrobial soap. The client is usually instructed to wash the surgical area vigorously several times to decrease the chance of wound infection.

Most agencies follow the recommendation of the Centers for Disease Control and Prevention (CDC) and the Association of periOperative Registered Nurses regarding the second phase. During the second phase, the skin is surgically prepared by removing hair in the operative site. The CDC and AORN recommend that this be done in the operating room. Shaving with a razor may cause cuts and nicks in the skin that promote the growth of microorganisms; therefore, performing this function immediately before surgery in the operating room, which is basically a controlled and germ-free environment, reduces the risk of wound contamination. Methods used to prep the skin are discussed in the intraoperative phase.

Nutrition

Nutrition and fluid considerations are determined by the client's health status and the nature of the surgical procedure and anesthesia. Clients scheduled for surgical procedures requiring only local anesthetic agents may be allowed a light breakfast or clear liquids the day of surgery. However, clients scheduled for regional or general anesthesia are instructed not to eat or drink (NPO) for 6 to 8 hours before surgery. Restricting food and fluids decreases the risk of aspiration of gastric contents into the lungs during anesthesia.

Clients at risk for dehydration are infants, the elderly, those with preexisting nutritional imbalances, and those having surgical procedures that cause extensive loss of blood and other body fluids. These clients are usually given intravenous fluids preoperatively to maintain fluid and electrolyte balances. Measurement of intake and output allows the nurse to monitor the client's fluid and electrolyte status.

Gastrointestinal Preparation

Gastrointestinal surgeries usually require special procedures to prepare the stomach or intestines.

Nasogastric Tube Some clients may require a nasogastric tube to facilitate stomach decompression to prevent postoperative abdominal distension. Insertion of a nasogastric tube causes client discomfort and can increase apprehension regarding surgery; therefore, the tube is usually inserted during the intraoperative phase when the client is under anesthesia. Inform clients that the tube can cause irritation to the nasal mucosa and may result in a sore throat.

Bowel Preparation The surgeon prescribes the type of bowel preparation on the basis of the surgical procedure. Enemas and laxatives are not routinely administered unless the client is having abdominal surgery. Intestinal surgeries require a bowel preparation to cleanse the intestines of fecal material by administering either a cathartic or enema to empty the bowel. Antibiotics are given to reduce the bacterial content. Cleansing the bowel is necessary because surgical manipulation of the intestines interrupts normal peristalsis. Also, incision of any portion of the gastrointestinal tract places the client at risk for peritonitis if fecal material enters the abdominal cavity.

The client is usually instructed to eat a light meal the evening before, avoiding high-fat foods, and is given a laxative. The morning of surgery, enemas may be given. If the surgeon orders "enemas until clear" (no fecal return), refer to the agency's policy. Administering enemas until clear can place the NPO client at risk for fluid and electrolyte imbalances. The client's stress response may already be compromised by the fear of surgery; administering repeated enemas may further decrease the client's coping mechanisms.

Urinary Elimination

The client is instructed to void before receiving the preoperative medication or being transferred to the operating room. The bladder needs to be empty to prevent distension and incontinence during the surgery.

Some surgeries can require continuous decompression of the bladder; the operating room nurse usually inserts a Foley catheter before or during surgery. See Chapter 39 for details on catheterization. If this occurs, the client should be informed about the catheter and how long the catheter will be left in place. Inform the client that a Foley catheter causes a sensation of pressure and an urge to urinate.

THINK ABOUT IT

Nursing Intervention

What should a nurse do if a client refuses a treatment? You are caring for a 16-year-old boy who was in an automobile accident and is scheduled for bladder surgery. The parents are present for perioperative teaching. You explain what will happen during the surgical procedure and that the boy will have a catheter after surgery. The boy gets upset, saying he does not want a tube. What type of age-related teaching materials might you use in this situation?

Safety Precautions

Outpatient clients are instructed to leave their jewelry at home and to avoid the use of makeup the day of surgery for safety reasons. Jewelry and other metal objects can cause burns when electrocautery is used during surgery. Rings can compromise circulation. Hairpins can injure the scalp when the head is positioned for anesthesia. Makeup and nail polish can interfere with the practitioner's assessment of oxygenation.

Unnecessary prosthetic devices should also be left at home to prevent client injury or loss. Outpatient areas have limited space to secure valuables. Contact lenses should always be removed and stored before surgery to avoid corneal ulceration and displacement. Partial dentures and other orthodontic devices must be removed to prevent displacement into the throat during anesthesia.

If the client feels helpless without certain devices, such as glasses and hearing aids, it should be documented on

the preoperative checklist that the client is wearing such devices. The operating room nurse removes such devices immediately before or after anesthesia induction.

Hospitalized clients are usually instructed to give their valuables to a family member before surgery. Otherwise these items are removed from the client's room and placed in a safe area according to hospital policy. The nurse documents on the preoperative checklist the disposition of valuables and prosthetic devices.

Medications

Efforts are made to continue routine medications throughout the perioperative experience. The physician instructs outpatient clients on which medications to take the day of surgery. The nurse is responsible the day of surgery to document which medications were taken and to notify the surgeon when drugs were omitted.

Clients scheduled to receive only local anesthesia are usually instructed to wait until after the procedure to take their medications unless there may be a time delay that could have a negative effect on the client. The following medications that increase a client's risk are withheld:

- Anticoagulants, ibuprofen, and aspirin: May increase blood loss. Clients routinely taking oral anticoagulants are given subcutaneous heparin to ensure prompt reversal with intravenous protamine sulfate should the need arise; oral anticoagulants are not reversed by protamine sulfate.
- Monoamine oxidase inhibitors: May interact with anesthetic agents and are discontinued 2 weeks before surgery.
- Aminoglycosides: Potentiate the effect of neuromuscular blockers.
- Oral hypoglycemic agents: Are continued until the evening before surgery except for chlorpropamide, which is discontinued 48 hours before surgery; to prevent intraoperative fluctuations in blood sugar, an intravenous infusion of glucose and insulin is begun before surgery.

The medication dosage can be adjusted preoperatively for certain drugs. For instance, corticosteroid therapy should be continued when clients have been maintained on the drug for 2 months or more; the dose to be given the day of surgery depends on the client's daily therapy.

Medications to reduce anxiety and facilitate the induction of anesthesia are administered as prescribed. To prevent client discomfort with traditional intramuscular preanesthetic injections, facilities with a "holding area" use this setting to initiate intravenous therapy and administer the pre-anesthetic drugs intravenously.

Evaluation

Evaluation of actual and expected outcomes of the perioperative client is done over the three phases. Preoperative evaluation focuses on the client's ability to verbalize and demonstrate the exercises. The outcome is evaluated when the client successfully performs the exercises after surgery. Measurement of the client's ability to perform postoperative exercises should first be assessed during the teaching session and again an hour later to evaluate learning. If the client needs coaching to perform the exercises, reinforce teaching until the client demonstrates the exercises appropriately.

Assessment of the client's knowledge regarding the nature, purpose, and risks of the surgical procedure is measured preoperatively. Likewise, the nurse listens to the client's comments and monitors physiological indicators (e.g., vital signs) to measure fears and anxieties regarding the surgery.

The evaluation of a client's preoperative preparation for surgery should include understanding of the procedure, verbalization and return demonstration of postoperative exercises, and postoperative expectations resulting from the surgery. Refer to the accompanying Nursing Process Highlight to understand how the nurse evaluates achievement of client expected outcomes.

Documentation

Documentation of preoperative activities must be entered in the client's medical record on the appropriate forms. The preoperative checklist is used to document accurate completion of preoperative activities. Documentation on this form means that all aspects of care have been performed as ordered. When the operating room (OR) personnel come to transfer the client, the preoperative nurse signs the checklist, entering the time and mode of transportation to the OR (e.g., by stretcher).

Nursing Process Highlight

EVALUATION

In evaluating the nursing care of Mrs. Broussard during the preoperative phase of her total hip replacement surgery, the following questions should be considered:

- What methods can be used to determine whether Mrs. Broussard understands the events that will occur during the surgery?
- What postoperative exercises should Mrs. Broussard be asked to demonstrate for the evaluation of her ability to perform these measures?
- What types of information should Mrs. Broussard be able to share about the postoperative course of treatment?
- What methods can be implemented to elicit Mrs. Broussard's concern or anxiety about the surgery itself or the expectations for her recovery?

INTRAOPERATIVE PHASE

The intraoperative phase begins when the client is transferred to the OR and ends with the client's discharge from the OR. The goal of nursing care during this phase is to ensure client safety. Maintaining a safe environment includes protecting the client from injury, infection, and complications arising from anesthetic agents, hazards, and the surgical procedure (see the accompanying Research Focus).

Surgical Environment

The surgical area usually consists of three zones: unrestricted, semirestricted, and restricted. The unrestricted area is designed for personnel to enter in street clothes: receiving desk, holding area, and locker rooms. Surgical attire (scrub clothes, disposable shoe covers, and caps) is required in the semirestricted and restricted zones. Hallways and storage areas constitute the semirestricted area. Restricted zones (controlled and germ-free areas) include the OR and rooms where sterile instruments are prepared.

Holding Area

The holding area is a unit where the surgical team prepares the client for surgery (Figure 30-10). The anesthetist usually starts the intravenous infusion and administers the preoperative intravenous medication. The nurse confirms that aspects of care on the preoperative checklist have been performed. A family member is usually encouraged to remain with the client while the client awaits transfer to the OR.

Surgical Team

The surgical team consists of the surgeon, anesthetist, OR nurses, surgical assistants, and other members of the health care team. The roles and responsibilities of the

Figure 30-10 Holding Area. What is this nurse doing to prepare this client for surgery?

RESEARCH FOCUS

Title of Study
"Clinical Decision-Making Process in Perioperative Nursing"

Authors
Parker, C., Minick, P., & Kee, C.

Purpose
The purpose of this phenomenological study was to reveal the processes of clinical decision-making by expert perioperative nurses.

Methods
Six expert nurses from five different hospitals in a large southern metropolitan area participated in the study. Expert nurses were defined as having worked a minimum of 5 years and considered themselves to be expert circulating nurses in the OR. Based on an interview guide, the participants were asked to describe any perioperative clinical situation in which they intervened on the patient's behalf and affected the patient's outcome by doing so. The interviews were transcribed verbatim; data were loaded into a software program to categorize, sort, and manage the data.

Findings
The predominant pattern contributing to the clinical decision-making process among the expert nurses was "seeing the big picture: engendered through caring." Multiple decisions were identified within each nurse's practice, and within each decision, certain characteristics were identified and categorized into themes. Data analysis identified three themes as requisite for expert clinical decision-making: connecting with patients; advocating for patients; and embodied knowing.

Implications
This study demonstrates that positive patient outcomes depend on the ability of the perioperative nurse to integrate all nursing knowledge, make rapid decisions, and constantly advocate for the patient. These data also suggest that nurses and nursing students would both benefit if personal care experiences were shared so that the taken-for-granted knowledge of clinical practice could be examined and caring practices could be made explicit.

Parker, C., Minick, P., & Kee, C. (1999). Clinical decision-making process in perioperative nursing. *AORN Journal, 70*(1), 45–62.

surgeon and anesthetist have already been discussed. The OR team usually consists of:

- Surgeon: Scrubbed and in surgical attire to perform the surgery
- Anesthesia provider: Masked and in clean scrub attire to administer the anesthesia
- Surgical assistant (first assistant): Can be another physician, a nurse, or physician's assistant (PA) who is scrubbed, in sterile attire, and assists the surgeon to ligate, suction, and suture
- Scrub nurse or technician: Scrubbed and in sterile attire; prepares the instrument tray and passes the instruments, sponges, needles, and sutures to the surgeon
- Circulating nurse: In clean scrub attire and mask; obtains supplies, delivers materials, pours solutions, handles specimens, positions the client and surgical drapes, and disposes of soiled items

Both the scrub and circulating nurses are responsible for counting the number of used instruments, needles, and sponges. Before the surgeon closes the incision, these items are counted to ensure that nothing is being left in the operative site.

Occupational Hazards

Perioperative personnel are at risk of exposure to harmful pathogens and other dangers. Dangers of a particular concern to perioperative nurses are latex allergies, needlesticks, eye splashes, back injuries, and indoor pollution. Precautions should be in place that are in compliance with Occupational Safety and Healthcare Administration (OSHA) standards regarding blood-borne pathogens, medical waste and hazards materials, including personal protection devices, disposal of needles and syringes, and contaminated supplies. See Chapter 31 for a complete discussion of latex allergy and OSHA's standards.

Health care agencies need to have a process in place to document compliance with OSHA requirements. Akdumann (1999) studied the compliance of OR personnel with universal precautions during surgical procedures in four subspecialties: orthopedic, gynecologic, cardiothoracic, and general surgery. Personnel were informed in advance about data collection regarding the use of protective equipment. The study revealed that only 39% of the personnel wore protective goggles, 5% wore face shields, 32% wore regular glasses, and nearly one-fourth wore no eye protection. Although double-gloving was higher in orthopedics than other areas, only 28% of the observed personnel double-gloved. A 22% rate of exposure was observed during 76 cases with three percutaneous injuries (two scalpel, one needle-stick) and 14 cutaneous blood and bodily fluid exposures. The study proposed the need for consistent training in and reinforcement of OSHA's guidelines.

Slattery (1998) refers to the hospital environment as a "chemical soup" and addresses the agents that compromise the quality of indoor air. Pollution in the OR is caused by fumes from high levels of disinfectants, surgical smoke from tissue being cut, vaporized, or coagulated, and waste gases from anesthetic agents. Disinfectants such as glutaraldehyde used to sterilize instruments are not regulated, and the fumes may cause serious respiratory and dermatologic problems. OR nurses are also at risk with respect to laser plume or surgical smoke, which can lead to respiratory problems, burning, watery eyes, nausea, and viral contamination and regrowth. To decrease the exposure to these dangerous pollutants, agencies should have policies in place that require clients and personnel to wear high-filtration masks and to provide the rooms with smoke evacuators.

Assessment

The first activity of assessment for the OR nurse is to check the client's identification band and confirm the surgical site. Agency protocol and standards of care from the AORN establish the focus areas of assessment for the client and the environment.

Assessment of proper positioning to ensure comfort and safety includes:

- Checking for client alterations that can affect positioning during the procedure, such as previous skeletal or joint surgery, presence of a joint or vascular prothesis, poor nutrition, and skin integrity
- Making sure the OR bed is prepared to receive the client: for example, warming mattress on bed, proper orientation of bed, bed wheels locked
- Ensuring that accessories are clean and readily available for a specific position: for example, Wilson frame, chest rolls, pillows, headrest

Throughout the surgical procedure, the nurse assesses for pressure areas of the extremities, joints, or any body surface; skin discoloration; and temperature. Whenever the client's position is changed during surgery, the nurse reassesses for signs of circulatory impairment from positioning and equipment in contact with the skin.

Nursing Diagnoses

Common intraoperative nursing diagnoses promote client comfort, safety, and support during the surgical procedure. See the previous display of nursing diagnoses in the section on Perioperative Nursing Diagnoses.

Outcome Identification and Planning

The focus of intraoperative care planning is on nursing activities that promote the client's achievement of expected intraoperative outcomes (see the accompanying display).

COMMON INTRAOPERATIVE CLIENT OUTCOMES

- The client demonstrates knowledge related to the physical environment and surgical intervention.
- The client's needs are met while in a dependent state from the anesthesia.
- The client is maintained in a safe germ-free environment during the surgical procedure.
- The client is free from infection 72 hours postoperatively.
- The client's skin integrity is maintained by proper positioning on the operating room table.
- The client is maintained in proper body alignment to prevent injury from positioning.
- The client is free from injury related to exposure from heat loss.
- The client is free from injury related to chemical, electrical, and physical hazards.
- The client's fluid and electrolyte balance is maintained.

These outcomes are directed at placing the client in a safe environment free from injury. The OR team monitors the client throughout the surgical procedure for complications.

Specific nursing care is planned to encompass the surgeon's specifications for positioning and to alleviate or prevent any individual client problem. Surgeons have preference cards that identify the type of equipment and instruments for various surgical procedures (e.g., indications and use of electrical equipment). Planning also involves determining the appropriate mode of client transfer, determining equipment and positioning aids, or determining the need for ancillary personnel to accomplish the positioning. The plan of care should be individualized to include needs relative to the client's health status such as diabetes, malnourishment, or paralysis.

THINK ABOUT IT

Nursing Care and Client Populations

What options are available to nurses who have personal objections to caring for certain client populations?

A Special Committee on Ethics of the AORN conducted a study to elicit the acquired immunodeficiency syndrome (AIDS)-related knowledge, attitudes, and practices of perioperative nurses. The findings revealed that:

> Nurses continue to be reluctant to provide care to HIV-positive patients if given a choice. Sixty percent of perioperative nurse respondents said they "somewhat agreed" or "strongly agreed" with this sentiment compared with 62% of the respondents in the original study. One AORN respondent said, "I don't believe anyone should be legally required to care for any patient with any illness/disease (Reeder, Hamlet, Killen, King, & Uruburu, 1994, p. 456).

What is your reaction to the AORN respondent? Read the American Nurses Association Code of Ethics in reviewing your own values toward HIV-positive clients.

Interventions

Nursing interventions are selected to facilitate caring and to achieve the expected outcomes, such as the client is free from infection 72 hours postoperatively. Because anesthesia inhibits the client's ability to protect self, the OR staff implements surgical asepsis, safe positioning, and other interventions that promote client safety (e.g., the client is never left unattended).

Nursing care includes communication skills to reduce the client's anxiety. The OR staff communicates a caring attitude, functioning under the assumption that anesthetized clients will be able to recall comments made during surgery.

Surgical Asepsis

Surgical asepsis is used to decrease the client's risk for an infection. Surgical asepsis refers to handwashing, wearing surgical attire, handling sterile instruments and equipment, and establishing and maintaining sterile fields. The sterile field is free of microorganisms and only sterile items can be placed inside the field. See Chapter 31 for a complete discussion of surgical asepsis.

Surgical handwashing is performed to remove soil and microorganisms from the skin. The skin on the hands and arms should be intact (free of lesions). Agency policy determines how the scrub is to be performed (e.g., method and timing).

Once the scrub nurse is properly attired for surgery, strict adherence to aseptic principles guides all actions. The hands and arms are held above the waist at all times. Only attire from the waist to the gown's collar and the anterior surface of the sleeves is considered sterile. The scrub nurse sets up the instrument table, using sterile drapes and instruments. Only the tops of instrument tables are considered sterile. Items placed within a sterile field are opened, dispensed, and transferred using technique to maintain the item's sterility. Soiled or contaminated articles are removed immediately from the room by the circulating nurse.

Skin Preparation

Skin preparation (prep) is performed to decrease the risk for infection by reducing the resident microbial count on the skin and inhibiting rebound growth of microbes when the skin is incised during surgery. The second phase of the surgical skin preparation is usually done by OR personnel before surgery to prevent the growth of microorganisms.

Guidelines for when and where the skin is to be prepped for the surgical procedure differ according to agency policy, surgeon's preference, and incision site. The preference card usually indicates the type of preparation. The OR nurse ensures that the operative site is clean.

The skin preparation should comply with the CDC recommendations to avoid unnecessary hair removal

and to shave immediately before an operation. Hair can be removed by clipping, depilatory, and shaving with a razor. A dry shave refers to the removal of hair by clipping or the use of a depilatory. Shaving with a razor and a warm, antiseptic solution is often called a wet shave. Figure 30-11 designates the body surfaces to be prepared for surgical procedures involving the head, neck, ear, and upper thorax. Preparation of the upper extremities, chest, and abdomen are illustrated in Figure 30-12.

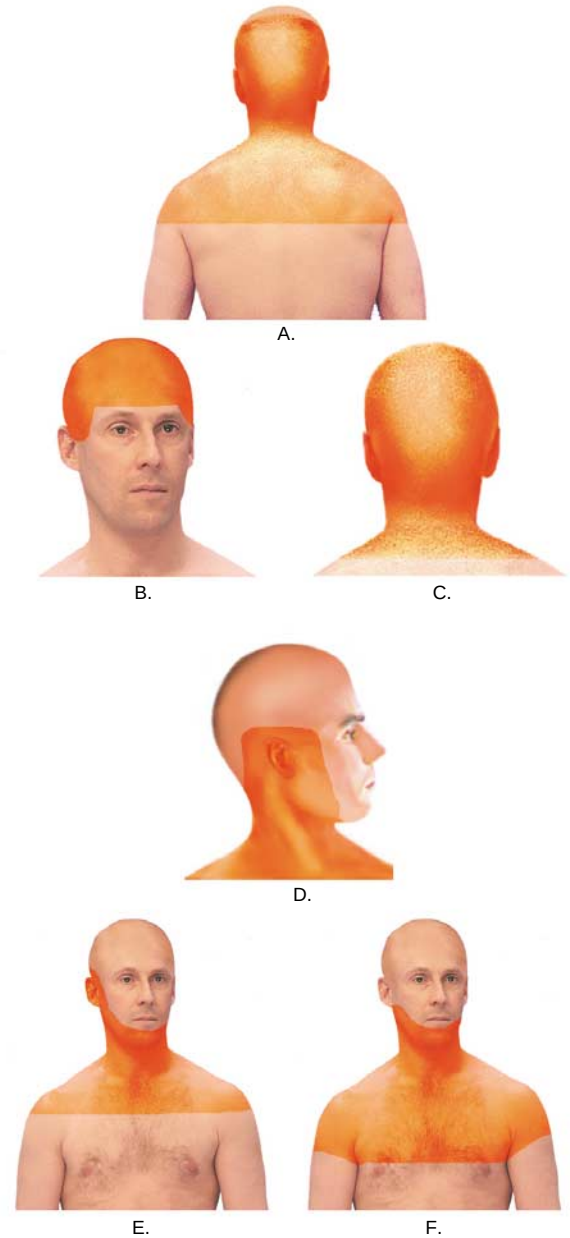


Figure 30-11 Preparation of the Head for Surgery: A.–C. Head for a Craniotomy; D. Neck for Otological Surgery; E., F. Upper Thorax for Thyroidectomy

Figure 30-12 Surgical Preparation of Upper Extremities and Trunk for Surgery, Anterior and Posterior Views

NURSING ALERT

Chemical Burns

After the skin preparation, remove all solution that has pooled under the client; chemical skin burns can result from prolonged exposure to antiseptic solutions.

When performing a skin prep, the nurse should provide the client with an explanation of the procedure, privacy, comfort, and safety. Common agents for prepping the skin include povidone-iodine, chlorhexidine, alcohol, and hexachlorophene. If the client has any adverse reactions to the prep, the nature of the reaction should be documented and the physician notified.

Positioning and Draping

The surgical client is usually sedated or anesthetized and therefore is unable to communicate any discomfort. Proper positioning ensures client comfort and safety, preserves vascular supply, and prevents neuromuscular damage to tissue. At the same time, positioning also provides access to the surgical site, airway, intravenous lines, and all monitoring devices.

All sharp surfaces in contact with the client's skin are padded to prevent injury from positioning. Bony prominences (e.g., sacrum and heels) are padded to avoid excessive pressure on these points. The nurse ensures that skin surfaces are insulated from metal bed attachments (e.g., padded arm boards, headrest, stirrups). Appropriate devices are made available to support extremities to prevent compression of vital structures, such as the ulnar nerve or Achilles tendons.

The circulating nurse ensures that at least four persons are available for positioning clients under general anesthesia. Restraints (or belts) are available to secure the client to the operating bed; sufficient soft padding is used to maintain anatomical alignment of the head and neck with the spine.

Once the client is positioned properly and the site has been prepped, the circulating nurse applies the sterile drapes. OR drapes are designed to expose specific operative sites. The staff keeps the sterile drapes dry and in place.

Electrical Hazards

During surgery the client can be exposed to an electrical surgical generator (electrocautery device to eliminate bleeding and reduce contamination). Electricity cannot flow unless a circuit is complete; thus, electricity introduced into the body has to find a pathway back to the generator. A ground pad is provided for that purpose.

Proper grounding technique is essential for the safe and effective use of the generator. The circulating nurse ensures that the selected ground site is free of skinfolds, scar tissue, erythema, skin lesions, or bony protuberances. The site should be as close as possible to the operative area. Throughout the surgery, the circulating nurse inspects the ground pad site for any unusual skin discoloration, burns, or skin reaction.

Lasers provide another method for cutting and coagulating tissue during the surgical procedure. Lasers deliver high energy-beams directly onto the tissue and reduce tissue damage and scarring that can inhibit healing. To prevent injury to the skin and eyes, the staff and conscious clients wear special high-filtration masks when the laser produces smoke.

Heat Loss

Injury from hypothermia is prevented by measures implemented to minimize heat loss. During surgery, body heat is lost by positioning on a cold OR table (conduction); administration of cold gases (convection); exposure of large operative sites, such as thoracic and abdominal areas (evaporation); and exposure to cold OR temperatures (radiation). Anesthetic agents can also alter thermoregulation and lower metabolism. Body temperature is maintained by applying warming mattresses or warmed blankets, warming and humidifying inhaled gases, warming irrigating and intravenous solutions, and increasing room temperature when the client is exposed, for example, for skin preparation and positioning.

Monitoring Physiological Functioning

After intubation and induction of anesthesia, the client is monitored for:

- Ventilation and circulation
- ECG and oxygen analyzer alterations
- Fluid intake, urinary output, and calculated blood loss
- Behavioral changes
- Body temperature
- Diagnostic testing (collection of specimens and cultures, x-rays and fluoroscopy)
- Placement of medical devices (ground pad, position support, drains, catheters, implants, packings, and dressings)

These measures assist in identifying and correcting any serious problems before they can result in client injury.

Evaluation

Before the client is transferred to the recovery room, the OR nurse evaluates and documents achievement of client outcomes. Evaluation is based on reassessment findings of the client during and after surgery. The nurse documents the specific data on the OR record,

which usually reflects AORN standards of intraoperative care and other direct care issues pertinent to client outcomes.

Transfer to Postanesthesia Care Unit

While the surgeon is closing the incision, the OR nurse gives a telephone report to a recovery room or PACU nurse regarding the client's health status, surgical outcomes, special equipment needs, and nursing interventions. This information allows the PACU staff time to prepare to receive the client.

Planning for personnel and equipment needed to safely transfer the client is usually handled by the circulating nurse. Moving the semianesthetized client from the OR table to the PACU stretcher for transport requires coordinated effort of at least four persons. Assurance is made that a sufficient number of staff are available to move the client while maintaining proper body alignment and preventing the dislodgement of any tubes, drains, or monitoring devices.

Safety measures are implemented to prevent injury to both client and staff members. The staff uses good body mechanics and assistive devices, such as draw sheets or body rollers, to allow proper weight distribution of the client. The stretcher wheels are locked to prevent movement. The client is always lifted from the table, as opposed to being dragged or pulled with draw sheets, to prevent skin irritation or shearing. The nurse applies stretcher belts (restraints) prior to transport. Also, the head of the stretcher is elevated, side rails are raised, and the placement of tubes and drains is confirmed.

NURSING CHECKLIST
Preparing the Postanesthesia Report

- Brief history of client's health status: preexisting conditions and medical diagnoses requiring surgery
- Baseline and OR vital signs
- Results of diagnostic testing (e.g., blood gases)
- Administration of anesthetic agents and other medications
- Estimated blood loss
- Total volume of output from all tubes and drains
- Total volume of infused intravenous fluids and blood products
- Presence and status of devices (e.g., tubes, drains, antiembolism hose)
- Any other problems treated during the surgery or other special nursing interventions

Once on the stretcher, the client is quickly transported by a nurse and anesthetist to the PACU. The client at this time is at high risk for injury related to the effects of residual anesthesia: airway distress, vomiting and aspiration, and circulatory alterations. The anesthetist stays with the client while the OR nurse gives a report to the PACU nurse assigned to the client. The report should include all pertinent anesthesia and surgery information (refer to the Nursing Checklist).

After giving the report, the OR nurse documents the time of discharge, method and disposition of transfer, and a general statement regarding the client's status. The client usually remains on the same PACU stretcher throughout the stay in the unit.

POSTOPERATIVE PHASE

The primary goal of nursing care during the immediate postoperative phase is to maintain the "A-B-Cs": airway, breathing, and circulation. Ongoing care is directed toward restoring the client to the preoperative health status. Clients receiving local anesthetics, without sedation, are usually transferred to the outpatient ambulatory care setting for observation while awaiting discharge. Their postoperative care is usually nonemergent in nature and is discussed later in the section titled Ongoing Postoperative Care.

General anesthesia requires intubation. Extubation is performed by the anesthetist before the client leaves the OR or in the PACU when assessment data confirm adequate gas perfusion. Clients with heart and other major surgeries are not extubated immediately. The endotracheal tube is usually removed on the first postoperative day. Intubated clients are usually transferred to intensive care units for 2 or 3 days.

Assessment

Following the initial assessment of the client's respiratory status, the nurse performs a total assessment (see Table 30-5). The postoperative nursing care protocol, based on AORN's standards of care, is initiated. The protocol identifies those areas requiring immediate assessment and reassessment as discussed in Table 30-5. Focused assessment is performed relative to the surgical procedure as discussed in the Nursing Process Highlight.

Nursing Diagnosis

Refer to the earlier display of perioperative nursing diagnoses. Clients with preexisting conditions, identified during the preoperative period, will continue to require special nursing care. Depending on the individual client's needs, other nursing diagnoses can be included in the plan of care.

Nursing Process Highlight

ASSESSMENT

During surgery Mrs. Broussard was placed in a lateral position and given a general anesthetic. She was extubated before leaving OR with an oral airway in place on arrival to PACU. Following assessment and management of the "A-B-Cs" the nurse assessed: alignment of the left hip; the client's level of pain; incision dressing for drainage, inspecting posteriorly where drainage can pool; and circulatory, motor, and sensory status below the site of surgery.

- What immediate assessment parameters must the nurse address to ascertain the status of the postoperative client?
- What priority areas must the nurse assess?
- What measures should be implemented to determine the client's level of pain?
- What are the nurse's priorities when inspecting the incision?
- What signs or manifestations should the nurse be alert for regarding the incision?

Some surgeries have unpleasant outcomes. The loss of an extremity or other body part or function can cause the client and family to experience ineffective coping. These situations require compassion and consideration to assist those involved to work through and express their feelings. Support needs to be given not only to the client but also to the family. Physical healing can occur before emotional or spiritual healing does. Learning to cope with a loss sometimes extends beyond the postoperative phase. See Chapters 11 and 21 for more information.

Outcome Identification and Planning

Planning the care for postanesthesia clients addresses the development of nursing interventions to achieve the client's expected outcomes during recovery from anesthesia and surgery. Care planning is done in two parts: immediate care rendered in the PACU area and ongoing post-PACU care. Nursing care in PACU usually lasts 1 to 3 hours and is directed toward returning the client to a safe physiological level of functioning after anesthesia. Care is prioritized according to the type of anesthesia and surgical interventions through the assistance of appropriate agency protocols (e.g., care of the client following extubation).

TABLE 30-5
Initial Postoperative Assessment: Normal and Abnormal Findings

Area of Assessment	Normal Findings	Abnormal Findings
Airway and Respiratory Status • Adequacy of airway and return of gag, cough, and swallowing reflexes • Type of artificial airway • Rate, rhythm, and depth of respirations • Symmetry of chest wall movements and use of accessory muscles • Breath sounds • Color of mucous membranes • Pulse oximeter readings • Amount and method of oxygen administration • If awake, ability to deep breathe and cough	The client is able to: • Expel an oral airway; gag reflex has returned • Breathe deeply and cough freely with normal rate for age, even, without use of accessory muscles, and chest wall symmetry; breath sounds present in all lobes; mucous membranes pink • Pulse oximeter reading between 95% and 100% • If awake, demonstrates proper use of incentive spirometer	• Upper airway obstruction: stridor, retractions, asymmetrical chest movement • Laryngospasm: high-pitched squeaky sounds • Dyspnea: shortness of breath or difficulty in breathing • Diminished breath sounds, wheezing, rales, or rhonchi • Residual neuromuscular blockage: weak inspiratory effort, inability to lift head, or inadequate muscle strength
Circulatory Status • Apical and peripheral pulses • Blood pressure (BP) • Nail bed and skin color and temperature • Capillary refill • Homans' sign Monitoring devices: • Cardiac monitor (ECG)	The client has: • Normal apical rate and peripheral pulses • BP within 20 mm of baseline measurements • Pink nail beds; skin warm and dry • Capillary refill <3 seconds • Negative Homans' sign • Normal ECG rhythm	• Hypotension: BP <20 mm of baseline; rapid, weak pulse; nail beds bluish; capillary refill >3 seconds • Hemorrhage/hypovolemic shock: rapid, weak pulse; increasing respirations; restlessness; hypotension; cold, clammy skin; pallor; urinary output <30 ml/hr

(continues)

TABLE 30-5 (continued)
Initial Postoperative Assessment: Normal and Abnormal Findings

Area of Assessment	Normal Findings	Abnormal Findings
• Pressure readings (arterial blood pressure or central venous pressure)		• Positive Homans' sign (calf pain present on dorsiflexion of foot) • ECG pattern: dysrhythmias; signs of cardiac ischemia
Neurologic Status • Level of consciousness (Glasgow Coma Scale) • Eye opening • Verbal response • Motor response	The client: • Spontaneously opens eyes • Is orientated • Obeys commands (Glasgow Coma Scale of 15, highest rating)	Glasgow Coma Scale <15 indicates some alteration in consciousness; a score of 7 is considered coma
Fluid and Metabolic Status • Intake and output • Palpate for bladder distention • Patency of intravenous (IV) infusion (type, rate, and amount) • Signs of dehydration (skin integrity and turgor) or overload (edema) • Patency, amount, and character of drainage (catheters, drains, or tubes) • Inspect operative dressing (type, color and amount of drainage) • Auscultate for bowel tones in all four quadrants and inspect for abdominal distension	Fluid intake balanced with total output, electrolytes within normal limits, considering replacement of blood volume lost during surgery: • IV fluids infusing per surgeon's order • Absence of bladder distension • Good skin turgor • Absence of edema • Drains and other tubing patent and intact • Dressing dry and intact • Bowel tones faint or absent during the immediate recovery phase • Absence of nausea and vomiting	• Signs of deficient fluid volume (thirst, poor skin turgor, low-grade temperature, tachycardia, respirations ≥30, a 10–15 mm decrease in systolic blood pressure, slow venous filling, urinary output <25 ml/hr) • Bright red blood on operative dressing • Signs of excess fluid volume (increased central venous pressure and edema, pulmonary or peripheral)
Level of Discomfort or Pain • Location, intensity, and duration • Type, amount of analgesia administered and client's response	Client free from pain	Pain not relieved by analgesia
Wound Management • Inspect the dressing • Note type and amount of drainage • If drainage is present, reassess in 15-minute intervals	Dressing dry and intact	Clot dislodged: bright red drainage on the dressing

After discharge from PACU, the nurse ensures that the client is knowledgeable about home care. Post-PACU care is begun for outpatients in the ambulatory setting. The nursing interventions reinforce client safety and teaching for discharge. For clients who are hospitalized postoperatively, the nursing care plan encompasses both inpatient and discharge needs.

Interventions

Care in the recovery unit is directed by standards of care and protocols. These tools assist the nurse in determining the most effective interventions for specific client populations, type of anesthesia, and surgical procedure. Postoperative nursing interventions are based on assessment and reassessment findings.

Safety measures are initiated immediately on arrival into the recovery unit (see Figure 30-13). Intubated clients require the constant attendance of a nurse at the bedside. The head of the stretcher is maintained in a high Fowler's position. Stretcher belts and side rails are left in place from transfer; wheels on the stretcher are locked. Lifesaving equipment is at the client's bedside.

Maintaining Respiratory Status

On arrival to the recovery area the client is placed on high-humidity oxygen and attached to a **pulse oximeter** (sensor device to measure the oxygen saturation level of the blood). The client is at risk for ineffective breathing patterns resulting from the anesthesia. At least every 15 minutes the nurse monitors the reading on the pulse

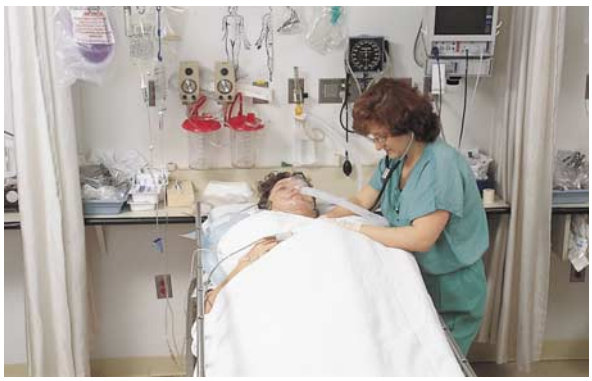


Figure 30-13 Postanesthesia Care Unit (PACU). What is the most essential action the nurse should implement with the client in this situation?

oximeter along with respirations. A patent airway can be maintained with an endotracheal tube, nasal or oral airways, and suctioning when needed. See Chapter 32 for a complete discussion of airway devices.

If the client is extubated and experiences difficulty in breathing, reestablish the upper airway: bring the chin forward, hyperextend the neck, and turn the head to the side. If the obstruction is unrelieved, insert either a nasal or an oral airway and suction. If these measures fail to relieve the obstruction, notify the anesthetist. The anesthetist is responsible for treating any physiological impairments related to anesthesia.

The nurse tapes the endotracheal tube on intubated clients to ensure proper placement. The client is maintained in a high Fowler's position to optimize breathing and lung expansion, unless contraindicated. Bronchial secretions are removed by suctioning the intubated client. Suctioning is performed on the basis of assessment findings:

- Rhonchi (low-pitched gurgling sounds in large airways)
- Low-pitched, musical wheezes despite bronchodilator therapy
- Increased peak airway pressure in clients receiving mechanical ventilation

The lungs are usually hyperinflated and hyperoxygenated before, between, and after suctioning to prevent hypoxemia and cardiac dysrhythmias. The nurse observes the ECG monitor while suctioning to observe for signs of hypoxemia.

Hypoxemia can be caused by inadequate lung ventilation from the depressant effects of anesthesia or narcotics. The PACU client is at risk for hypoxemia from the effects of general anesthesia, which reduces the inspiratory effort, and the presence of pain, which reduces ventilatory effort. Older or obese clients are especially vulnerable to postoperative hypoxemia (McCaffigan, 1996).

The early symptoms of hypoxemia are drowsiness and confusion. These symptoms are usually present in PACU clients recovering from anesthesia. A blood oxygen level measurement less than 95% is an indication of hypoxemia.

Extubation

The agency's protocol is implemented to determine the parameters for extubation, such as the client being able to lift the head for 5 seconds and produce strong bilateral hand grasps. The nurse obtains a tidal volume, negative inspiratory force, and vital capacity (if the client can cooperate) before extubation. See Chapter 32 for further discussion. The anesthetist is notified when the oxygen saturation percent is within safe limits to allow extubation.

The nurse confirms the presence of bilateral breath sounds immediately before and after extubation by auscultation. The procedure is explained to elicit client cooperation and to allay anxiety. Before extubation, the pharynx and trachea are suctioned. The client is instructed to inhale deeply while the anesthetist deflates the cuff and removes the endotracheal tube at maximal lung inflation to encourage initial gas flux outward, allowing the forceful exhaling of secretions.

The client is placed immediately on humidified oxygen for at least 30 minutes and monitored with a pulse oximeter for an hour after extubation. Ventilation is maintained by encouraging deep breathing, coughing, turning, and taking deep breaths every 5 to 10 minutes.

Maintaining Circulatory Status

The client is monitored carefully for the signs of hypotension (Table 30-5), which can occur from the myocardial depressant effects of residual anesthesia or hypovolemia. The cardiac monitor displays the client's heart rhythm; it is used to detect and treat tachycardia, bradycardia, dysrhythmias, and cardiac ischemia.

Hypovolemic shock (marked reduction in circulating blood volume) is caused from hemorrhage. The symptoms of hemorrhage are presented in Table 30-5. A rapid pulse rate can indicate pain, bleeding, dehydration, or shock. Impaired capillary refill indicates inadequate tissue perfusion to extremities.

Passive range of motion and the application of antiembolism hose or other devices promote circulation of the intubated or semiconscious client. Postoperative leg exercises are begun as soon as the client recovers from the effects of anesthesia. These measures prevent circulatory complications such as thrombophlebitis, thrombus, and embolus formation.

Maintaining Neurologic Status

Monitoring the client's level of consciousness is done in relation to how the airway is maintained:

- The unconscious client with an absence of the cough and gag reflex will have an endotracheal tube or airway.

- The semiconscious client with partial return of all reflexes will have an oral or nasal airway.
- The conscious client with full return of all reflexes will breathe without assistance from an artificial airway.

The Glasgow Coma Scale is used to measure the client's level of response. See Chapter 36 for a description of the Glasgow Coma Scale.

The nurse monitors clients who had spinal anesthesia for return of reflexes, sensation, and movement of extremities below the level of anesthesia. Extremities are assessed for color, temperature, and pedal pulses.

Nursing care of clients with spinal anesthesia includes the prevention of a postspinal headache. The postspinal headache is thought to be caused by the leakage of cerebrospinal fluid from the puncture site in the dura. Measures to prevent a headache include strict bed rest for 24 to 48 hours, adequate hydration with intravenous saline, and injection of 5 to 20 ml autologous blood into the epidural space at the puncture site.

Maintaining Fluid and Metabolic Status

During the immediate postoperative phase, gastrointestinal and genitourinary assessment and interventions are considered from a fluid and metabolic perspective. The client is maintained on intravenous infusions as prescribed by the surgeon. The goal of intravenous therapy is to maintain the circulating fluid volume. Infusion sites are inspected for patency immediately when the client arrives in the PACU. Frequent inspection of these sites is necessary throughout recovery; intravenous access must be maintained in the event of complications (e.g., hemorrhage) that warrant emergency administration of intravenous fluids or medications. Secretions from tubes, drains, and the incision site are measured to determine output. The client's total output is compared against the volume of intravenous replacement fluids.

After surgery, the muscle tone of the bladder is compromised by analgesic or anesthetic agents. Assess for bladder distension by palpating the contour of the lower abdomen for a rounded mass above the symphysis pubis. When clients cannot void within 8 hours, the surgeon is notified for an order to catheterize. If the client has a Foley catheter, it should flow freely with urine.

Nursing Alert

Abdominal Distension

When clients with abdominal surgery develop abdominal distension, inspect the tape over the incision dressing; tension on the tape can cause disruption of skin integrity (irritation and blisters). This can also increase the client's risk for a wound infection.

Postoperative nausea and vomiting can be caused by multiple factors. Anesthetic agents and opiates can stimulate the chemoreceptors of the inner ear and the vomiting center in the brain. Deficient fluid volume, electrolyte imbalances, drugs, and general anesthesia by mask technique can also cause nausea and vomiting. Nausea and vomiting are treated with antiemetics.

Anesthetic agents can decrease peristalsis, resulting in diminished or absent bowel tones. Manipulation of the intestines further decreases the loss of bowel tones. The nurse auscultates for bowel tones and inspects for abdominal distension. A nasogastric tube is usually in place for clients with abdominal surgery and clients at risk for nausea and vomiting postoperatively.

With abdominal surgery, the nurse also monitors for abdominal distension to detect internal hemorrhage. **Cullen's sign** (a bluish discoloration around the umbilicus in postoperative clients) can indicate intra-abdominal or perineal bleeding.

Clients are kept on an NPO status until the gag reflex returns, they are free from nausea, and the presence of bowel tones is detected. Certain drugs (analgesic/anesthetic agents) have a drying effect on the oral mucous membranes. Dehydration from loss of body fluids also causes dryness and thirst. Oral hygiene is performed frequently to promote comfort and prevent infections.

Managing Pain

Nurses assess for pain by allowing the client to rate the intensity of pain. Studies comparing nurses' and clients' ratings of pain have found little similarity between the two (Pasero, 1996). One study compared the pain ratings of 119 postoperative clients and their nurses. The ratings matched only 35% of the time; nurses underassessed pain in 45% of the cases and overassessed pain in 20% of the cases.

Pain management is monitored and treated by intravenous narcotics in titrated doses until the client is fully conscious. Once the client is fully conscious, pain is managed according to physician order: PCA, continuous epidural anesthesia, intravenous or intramuscular injection, TENS.

The nurse should institute comfort measures such as splinting the incision line and positional changes to decrease the client's pain repsonse. Besides incisional pain, the client can experience pain for other reasons, such as positioning during surgery, presence of tubes (endotracheal, nasogastric, chest, or Foley), and tight dressings or casts. Skin care and back rubs are done to promote comfort and circulation.

The Agency for Health Care Policy and Research (AHRQ) has clinically relevant practice guidelines for the management of postoperative pain. Three interdisciplinary panels, chaired by nurses, developed guidelines to inform the public on pain management:

- The provider should anticipate the pain.
- It is least therapeutic to be medicated when in pain.
- There are alternatives to pharmacologic management of pain.

Relaxation techniques, distraction, environmental manipulation, massage, and positioning are optional therapies. See Chapter 14 for additional information on complementary therapies for pain management.

Evaluation and Discharge from the PACU

The anesthetist is responsible for releasing the client from the PACU. Agencies have specific standards of care that have to be met before discharge. These standards address achievement of specific client outcomes with inherent parameters for evaluation, such as:

- The client is conscious, oriented, and can move all extremities.
- The client demonstrates full return of reflexes.
- The client can clear the airway and cough effectively.
- Vital signs have been stable or within baseline ranges for 30 minutes.
- Intake and urinary output are adequate to maintain the circulating blood volume.
- The client is afebrile, or a febrile condition has been treated accordingly.
- Dressings are dry or have only minimal drainage.

The surgeon manages the client's treatment throughout the remainder of the postoperative phase.

Ongoing Postoperative Care

The postoperative phase continues until the client is released from the surgeon's care. The primary goal during this phase is to restore physiological functioning, promote healing, and prevent complications. When the client is discharged from the PACU, the client goes either directly to an inpatient hospital bed or to the outpatient ambulatory unit for observation. The surgeon will later decide whether to admit the client to an inpatient 24-hour observation room or to discharge the client. When clients are discharged to their residence, they often require the services of a home health nurse to assist with their postoperative care. The home health nurse will continue to assess and provide necessary care until the client achieves the expected outcomes.

Postoperative nursing care after discharge is based on the nursing diagnoses and expected outcomes that still have not been met (see the accompanying display). Clients who are discharged without the services of a home health agency assume their own care or have a family member or significant other serve as the care provider. In this situation, specific written discharge instructions are explained to the client or care provider.

DISCHARGE TEACHING

Client Expected Outcomes

Before discharge, the client can:

- List the symptoms to be reported to the physician on occurrence.
- Describe limitations in activity.
- Explain dietary limitations.
- Explain the meaning and purpose of medications.
- Explain potential food or drug interactions.
- Describe the use of Standard Precautions as appropriate.
- Demonstrate aseptic technique in changing dressings.
- Demonstrate use or application of prescribed medical devices (identify appropriate device).

Ineffective Airway Clearance

Ineffective Airway Clearance during this phase can result from a diminished cough reflex or increased pulmonary congestion. The nurse monitors skin color and respiratory rate and depth and auscultates breath sounds to determine the adequacy of oxygenation and to identify complications (e.g., atelectasis). Deep breathing and coughing and the use of the incentive spirometer are continued until the client demonstrates achievement of respiratory outcomes.

Ineffective Tissue Perfusion

Ineffective Tissue Perfusion (Cardiopulmonary) related to inadequate circulation is a possible nursing diagnosis. The nurse monitors pulse rate and quality, blood pressure, skin and nail bed color and condition, and temperature for indications of decreased oxygenation at the cellular level. Capillary refill and peripheral pulses are checked for adequate circulation to the extremities. The nurse monitors the lower extremities for signs of superficial vein thrombosis (local warmth, swelling, pain, redness) and deep vein thrombosis (a positive Homans' sign).

Postoperative leg exercises are performed until the client is able to ambulate and resume activities of daily living. Antiembolism hose are usually worn until the client returns for the first office visit. At that time the surgeon assesses the need to continue use of the hose.

Other devices, pneumatic compression, and CPM are maintained according to the physician's order. Clients are encouraged to ambulate while these devices are in place to promote respiratory, circulatory, and gastrointestinal functions. The CPM device is used until signs of incision swelling have decreased, healing is evident, and range of motion is achieved.

Deficient Fluid Volume

Deficient Fluid Volume can be related to active fluid volume loss, inadequate fluid intake from being NPO, or nausea and vomiting. The client is monitored for intake and output that includes secretions from drainage tubes, drains, and dressings. If oral fluids are restricted, the client is

maintained on intravenous infusions as ordered by the surgeon. The nurse monitors the patency of the intravenous line, observes for signs of infiltration, and records the amount and type of fluids infused. The nurse assesses for signs of dehydration or fluid overload. See Chapter 37 for a discussion of fluid balance.

Home health clients with continuous intravenous therapy are maintained on an infusion pump. The caregiver is taught how to add infusions to the line under sterile technique. The home health nurse visits the client daily to assess for intravenous patency. A nurse is usually on call 24 hours for clients receiving continuous infusions.

Imbalanced Nutrition

Imbalanced Nutrition: Less Than Body Requirements is usually related to anesthesia or surgical manipulation of the intestines. Until peristalsis returns and nausea, anorexia, or vomiting subsides, the client is maintained on intravenous therapy to maintain fluid and electrolyte balance. Nasogastric tube drainage is measured, and color and consistency are documented. See Chapter 38 for more information.

Clients with abdominal surgery can take up to 2 to 3 days or longer for return of normal gastrointestinal function. The nurse auscultates the abdomen for gurgling and rumbling sounds in all four quadrants to indicate return of peristalsis. Early ambulation promotes the return of peristalsis. When bowel tones return and nausea subsides, the client's diet is progressive: first ice chips, then clear to full liquids; if tolerated, the diet is progressed to soft or regular. Some clients are on a regular diet within hours after surgery. See Chapter 38 for a discussion of types of modified diets.

Urinary Retention

Urinary Retention is related to anesthesia or surgical manipulation that causes temporary loss of bladder tone. Efforts are made to promote urination (e.g., male clients are more prone to void if they can stand). If the client does not void within 8 hours after surgery, assess for bladder distension and notify the surgeon. The surgeon can order a straight or Foley catheter. *Clients must void before they can be released from the ambulatory setting.*

Acute Pain

Position changes and splinting are continued to relieve pain. Clients can be discharged to home with a PCA pump. Before discharge the nurse ensures that the client is able to correctly self-administer using the PCA. Efforts are made to provide adequate rest by scheduling procedures that do not interfere with sleep.

Risk for Infection

The client with a surgical incision is at risk for infection. Wound healing begins as early as 2 hours after surgery. The nurse ensures that the dressing is clean, dry, and intact; dressings promote rapid re-epithelialization and protect against infection. Various types of dressings are used: conventional absorbent nonocclusive, semiocclusive hydroactive, and occlusive hydrocolloid.

In a study of 250 heart surgery clients, Wikblad and Anderson (1995) found that hydroactive dressings were not as effective as occlusive hydrocolloid and absorbent nonocclusive dressings in preventing wound infections. Hydroactive dressings were difficult to remove and painful to the client. An earlier study by Bolton and van Rijswijk (1991) showed that epithelialization can be delayed by repeated trauma or removal of dressings that have aggressive adhesives.

Nurses use Standard Precautions when caring for clients and sterile technique when changing a dressing. The incision line is assessed when the nurse changes the dressing. For some clients, the surgeon usually orders prophylactic antibiotics and removes any catheters or drains as soon as possible to prevent an infection. If the client were to develop a deep wound infection, it could necessitate prosthesis removal.

To monitor for signs of an infection, the nurse notes the type and amount of drainage on the dressing and the stage of wound healing. Vital signs are measured, recorded, and analyzed against laboratory results, especially the white blood cell count and differential. The client is taught to care for the wound and to observe for the complications of wound healing: hemorrhage, hematoma formation, infection, dehiscence, and evisceration. See Chapter 35 for a discussion of these complications.

NURSING CHECKLIST
Postoperative Documentation

- The client's respiratory function has returned to baseline level within 1 week after surgery as demonstrated by respirations 16 to 20/minute, deep and regular, skin color pink, lungs sounds clear on auscultation; oxygen saturation greater than 95%.
- The client's cardiopulmonary function has returned to baseline level within 1 week after surgery as demonstrated by: blood pressure with 10 to 20 mm Hg of baseline measurement; absence of dysrhythmias; pulse rate 60 to 90 beats per minute; skin pink, warm, and dry; capillary refill less than 3 seconds; peripheral pulses present; negative Homans' sign; output is within 500 ml of intake.
- The client is free from signs of a wound infection within 72 hours after surgery as demonstrated by: afebrile; pulse and respirations at baseline level; sutures intact; incision line without swelling, redness, or purulent exudate; scab sloughing.

Evaluation

Evaluation is based on client-specific postoperative nursing diagnoses and achievement of outcomes. The time frame for the client's achieving the outcomes can vary with the client's health status, surgical procedure, and other factors, such as age. The nurse documents achievement of outcome criteria data (see the Nursing Checklist on the previous page).

KEY CONCEPTS

- The major role of nursing functions in caring for the perioperative client is to foster the achievement of expected outcomes of care.
- Outpatient surgical clinics decrease the client's length of stay in the hospital and health care costs.
- Management of the perioperative client occurs in various health care settings.
- Effective perioperative management is directed by a multidisciplinary team on the basis of recognized standards of care, protocols, and individualized expected client outcomes.
- Assessment of the client's status before surgery establishes baseline data to direct interventions throughout the perioperative phases.
- Interventions of the health care team focus on decreasing the perioperative client's risks for complications.
- Documentation of the client's response to interventions and achievement of expected outcomes provides the framework for evaluation.
- Coordination of discharge care begins in the preoperative phase and is reinforced throughout the other two phases.

CRITICAL THINKING ACTIVITIES

1. Mrs. G is a 45-year-old wife and mother who needs an emergency hysterectomy; however, she has no health insurance. Where should Mrs. G seek surgical intervention? With emergency surgery there is little time for client teaching. How does the nurse handle this challenge? What type of support should the family receive?
2. An 11-year-old child is hospitalized for surgical repair of an ankle injury. The child lives with a single parent, a 5-year-old brother, and a 3-year-old sister. What age-related considerations need to be incorporated into planning the discharge care of the child, keeping in mind the implications on the family unit?
3. Mr. S is an 86-year-old inpatient client scheduled for heart surgery. The evening before surgery he requests the sacrament of Anointing of the Sick. What nursing activities should the nurse institute?
4. Although the primary activity of perioperative nursing is client-centered care, nurses must also have an awareness of inherent "cost" challenges. Discuss how nurses can have a positive or negative impact on health care costs related to surgery.
5. You are working the evening shift on a surgical unit. You assess a client on his second postoperative day; he is receiving morphine, 2 to 4 mg/hr, with a PCA pump. He has had 17 mg morphine during the past 6.5 hours. During your assessment you observe that he is nodding and unable to tell you the day of the week, his color is pale, the vital signs are: T-37°C, P-94, R-12, BP 144/92. What nursing actions should you initiate to determine if the client's symptoms are caused from a lack of sleep, the morphine, or hypoxemia?
6. Identify the ongoing postoperative nursing diagnoses, expected outcomes, interventions, and evaluation criteria in planning the discharge care for Mrs. Broussard from the hospital the second postoperative day.

WEB RESOURCES

Agency for Health Care Policy and Research (AHRQ)
www.ahrq.gov

Association of periOperative Registered Nurses
www.aorn.org

Occupational Safety & Health Administration, U.S. Department of Labor
www.osha.gov