7

CHAPTER SEVEN

Caring for the Client with Burns

Terms you'll need to understand:

- ✓ Allograft
- ✓ Autograft
- ✓ Biosynthetic graft
- ✓ Burn shock
- ✓ Consensus formula
- ✓ Contracture
- ✓ Debridement
- ✓ Donor site
- ✓ Emergent phase of burn injury
- ✓ Eschar
- ✓ Heterograft
- ✓ Homograft
- ✓ Intermediate phase of burn injury
- ✓ Jobst garment
- ✓ Lund and Browder method
- ✓ Palm method
- ✓ Parkland formula
- ✓ Rehabilitative phase of burn injury
- ✓ Rule of Nines
- ✓ Total body surface area (TBSA)

Nursing skills you'll need to master:

- ✓ Performing sterile dressing change
- ✓ Administering medications
- ✓ Transfusing blood and blood products
- ✓ Performing tracheostomy suction and care
- ✓ Monitoring central venous pressure
- ✓ Caring for central lines
- ✓ Assessing a burn injury using the Rule of Nines
- ✓ Calculation of IV fluid requirements using the Parkland formula and the Consensus formula

Although the incidence of burn injury has declined, burns still account for about 2,000,000 injuries each year in the United States. According to the American Burn Association (2000), more than 51,000 persons require hospital care each year for treatment of their injuries. Those with burns greater than 25% total body surface area (TBSA) are at risk of dying from smoke inhalation and other complications associated with burns. Young children and the elderly are particularly vulnerable to local and systemic effects of burns because their skin is naturally thinner. Burns are the third leading cause of death in children under age 14 and are in the top 10 of causes of death for all age groups.

Burns generally occur from one of three major sources:

- Thermal injuries (hot liquid, open flame)
- Electrical injuries (household current, lightning)
- Chemical injuries (alkaline or acid liquids or powders)

Radiation injuries are most likely to occur with industrial accidents where radioactive energy is produced or in situations where radioactive isotopes are used. More discussion on radiation injuries can be found in Chapter 18, "Emergency Nursing."

Most burns are thermal injuries that occur in the home. Cooking accidents from hot grease or stove fires result in a significant number of injuries, as do scalds from bath water that is too hot.

CAUTION

To prevent burns, hot water heaters should be set no higher than 120° Fahrenheit.

Carbon monoxide, sulfur oxides, cyanide, chlorine, and other toxins are released from household contents during a fire. Inhalation of these gases damages the lower airway, resulting in the collapse of the alveoli and increasing the possibility of acute respiratory distress syndrome.

Burn Classifications

Before discussing caring for the client with burns, we must first look at how burns are classified. Treatment of the client with burns is dictated by whether the injury is classified as a *minor burn*, *moderate burn*, or *major burn*. These classifications are dependent on the degree of tissue involved and the total body surface area affected by the injury. Burns are further classified in terms of the depth of tissue destroyed or the *thickness* of the burn injury. The following list gives you an idea of the different degrees of burns, the symptoms experienced with the injury, and the expected time of healing:

- **Superficial partial thickness (first degree)**—Tissue damage is confined to the epidermis and possibly a portion of the dermis. This is the type of injury produced by sunburn or a low-intensity flash. The skin appears red but blanches with pressure. Blisters may or may not be present. The client usually complains of tingling, increased skin sensitivity, and pain that is relieved by the application of cool water or lotions containing aloe. The injury heals within a week. Although the skin peels, there is no scarring.
- **Deep partial thickness (second degree)**—Tissue damage involves the epidermis, upper dermis, and portions of the deeper dermis. Deep partial thickness injury is common in scalds and flash flames. The area involved appears blistered with weeping and edema. The client experiences pain and increased skin sensitivity, which increases with exposure to air. The use of sterile sheets and overbed cradles minimizes contact with the air and makes the client more comfortable. Morphine sulfate or other opiate analgesics are given intravenously to control pain.

CAUTION

Pain medication is given intravenously to provide quick, optimal relief and to prevent overmedication as edema subsides and fluid shift is resolving.

Deep partial thickness injury generally heals in two to four weeks, although infection can delay healing. Infection can also take a deep partial thickness injury to a full thickness injury.

- **Full thickness (third degree)**—Tissue damage involves the epidermis and entire dermis. The damage usually extends into subcutaneous tissue, including connective tissue, muscle, and bone. Full thickness burns result from prolonged exposure to hot liquids or open flame, electrical current, or exposure to chemical agents. Depending on the source of the injury, the affected area can appear dry, pale white, edematous, leathery, or charred. Destruction of nerve endings leaves the affected areas relatively pain free. Complicating the care of the client with full thickness injury is the development of hypovolemic burn shock, hyperkalemia, and anemia. Electrical injuries, which appear as whitish areas at the points of entry and exit, can result in changes in heart rhythm or complete cardiac standstill.

CAUTION

The cardiac status of a client with electrical burns should be closely monitored for at least 24 hours following the injury to detect changes in electrical conduction of the heart.

CAUTION

Full thickness burns can damage muscles, leading to the development of myoglobinuria, in which urinary output becomes burgundy in color. The client with myoglobinuria may require hemodialysis to prevent tubular necrosis and acute renal failure.

Burn Measurement with TBSA

A second means of classifying burns is based on the percentage of tissue injured. Three methods are used to determine the total body surface area injured in a burn:

- **The Rule of Nines**—The Rule of Nines assigns percentages of 9 to major body surfaces. The breakdown is as follows: head = 9%, anterior trunk = 18%, posterior trunk = 18%, arms = 9% each, legs = 18% each, and perineum = 1%. The rule is demonstrated in Figure 7.1.

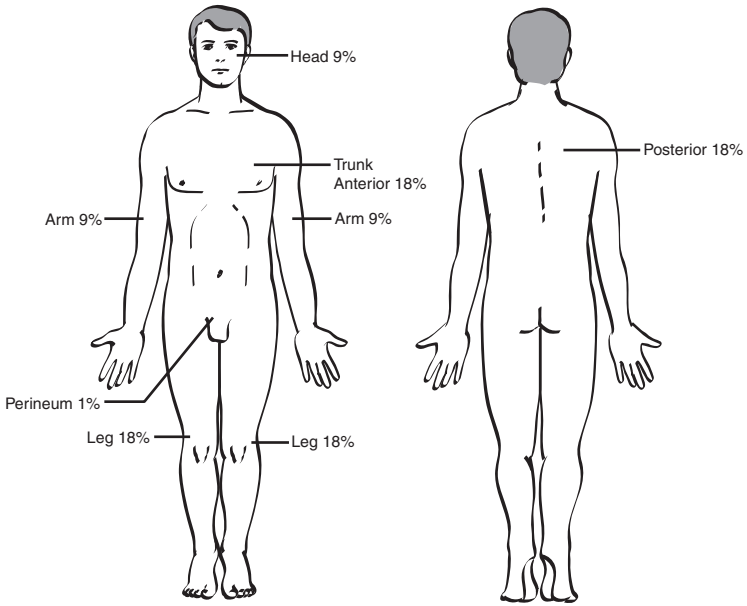

FIGURE 7.1 The Rule of Nines.

- **Lund and Browder method**—The Lund and Browder method of determining TBSA is more precise because it takes into account that anatomic parts, especially the head and legs, change with growth. Special charts divide the body into very small parts and provide for an estimate of the proportion of TBSA burned. The Lund and Browder method is used to estimate TBSA in children.

- **The palm method**—The percentage affected by scattered burns may best be calculated using the palm method. The size of the client's palm represents approximately 1% of the TBSA.

Minor burn injury involves a second degree burn or less than 15% of TBSA in adults and less than 10% in children. Or, it can involve a third degree burn of less than 2% TBSA but not involving areas requiring special care (face, eyes, ears, perineum, and joints of hands and feet). Minor burns do not include electrical burn injury, inhalation injury, those clients with concurrent illness or trauma, or age-related considerations.

Moderate burn injury involves second degree burns of 15%–20% TBSA in adults, 10%–20% in children, or third degree burns less than 10% TBSA that do not involve special care areas. Moderate burns, like minor burns, do not include electrical or inhalation injury, nor those with concurrent illness, trauma, or age-related considerations.

Major burn injury involves second degree burns greater than 25% TBSA in adults, 20% in children, or all third degree burns greater than 10% TBSA. Major burns include all burns involving the structures of the head and face, hands, feet, and perineum as well as electrical and inhalation injury, concurrent illness, and trauma regardless of age.

CAUTION

It will be beneficial to review your nursing textbooks for local and systemic reactions to burns because these injuries affect all body systems and cardiovascular and renal function in particular.

Nursing Care for Burn Victims

Caring for a burned client represents a unique challenge to even the most experienced nursing staff because few injuries pose a greater threat to the client's physical and emotional well-being. There are three phases of burn injury, each requiring various levels of client care. The three phases are

- Emergent
- Intermediate
- Rehabilitative

Psychological Care of a Burn Patient

Although interventions are focused on meeting the client's physiological needs during the emergent period, the nurse should keep in mind that the nature of the injury represents a time of extreme crisis for both the client and his family. Every effort should be made to provide emotional support by providing understandable explanations of procedures and making sure that the client is kept as comfortable as possible. When necessary, appropriate referrals should be made to clergy and other professionals. Interventions directed at stabilizing the client's condition as well as the type of emotional support will change as the client moves through the emergent, intermediate, and rehabilitative phases of injury.

The Emergent Phase

The emergent phase begins with the onset of burn injury and lasts until the completion of fluid resuscitation or a period of about the first 24 hours. During the emergent phase, the priority of client care involves maintaining an adequate airway and treating the client for burn shock.

Emergency care of burns at the site of injury includes

- Extinguishing the burn source
- Soaking the burn with cool water to relieve pain and to limit local tissue edema
- Removing jewelry and nonadherent clothing
- Covering the wound with a sterile (or at least clean) dressing to minimize bacterial contamination
- Brushing off chemical contaminants, removing contaminated clothing, and flushing the area with running water

CAUTION

The eyes should be irrigated with water immediately if a chemical burn occurs. Follow-up care with an ophthalmologist is important because burns of the eyes can result in corneal ulceration and blindness.

Major Burns in the Emergent Phase

If the injury is determined to be a major burn injury, the following additional interventions will be taken during the emergent phase of burn care. Assessment of the following needs to take place during this phase:

- Airway
- Breathing
- Circulation

CAUTION

Important steps in treating a burn client include

- **Treat airway and breathing**—Traces of carbon around the mouth or nose, blisters in the roof of the mouth, or the presence of respiratory stridor indicate the client has respiratory damage. Endotracheal intubation with assisted ventilation might be required to achieve adequate oxygenation.
- **Ensure proper circulation**—Compromised circulation is evident by slowed capillary refill, a drop in normal blood pressure, and decreased urinary output. These symptoms signal impending burn shock.

These interventions come next:

- Insertion of a large bore catheter for administering IV fluids
- Calculation of TBSA involved
- Calculation of fluid needs according to one of the fluid resuscitation formulas

CAUTION

It is important to remember that the actual burns might not be the biggest survival issue facing burn clients. Carbon monoxide from inhaled smoke can develop into a critical problem as well. Carbon monoxide combines with hemoglobin to form carboxyhemoglobin, which binds to available hemoglobin 200 times more readily than with oxygen. Carbon monoxide poisoning causes a vasodilating effect, making the client have a characteristic cherry red appearance. Interventions for carbon monoxide poisoning focus on early intubation and mechanical ventilation with 100% oxygen.

In the hours immediately following a major burn injury, loss of capillary permeability allows intravascular fluid to flood into the extracellular space. During the emergent or resuscitative phase, efforts are directed at preventing or reversing burn shock using fluid replacement formulas. Although there are a number of acceptable formulas for calculating fluid requirements, the Parkland formula and Consensus formula are most often used.

The Parkland Formula

The Parkland formula provides a large volume of IV fluid in the first 24 hours to prevent deepening hypovolemic shock and further acidosis. After the first 24 hours, the amount of fluid infused should be titrated according to the urinary output, with the goal of maintaining the output between 30 ml and 50 ml per hour.

The following example steps you through a calculation of TBSA using the Rule of Nines and the fluid requirements using the Parkland formula:

A client receives full thickness burns of the arms, chest, back, and head at 0600 hours. The client weighs 180 pounds. Using the Parkland formula, how much fluid should the client receive by 1400?

Parkland formula:

Ringer's Lactate 4 ml × kg body weight × % TBSA

Half of the amount is to be infused in the first 8 hours.

The remainder is to be infused over the next 16 hours.

With this information, what steps should you follow? The steps given below will help you calculate this if you have difficulty:

1. Calculate the TBSA using the Rule of Nines:

   arms (9% each arm) = 18% + chest (18%) + back (18%) + head (9%) = 63%

2. Convert the client's weight from pounds to kilograms:

   180 pounds ÷ 2.2 pounds (2.2 pounds = 1 kg) = 81.8 kg (round to 82 kg)

3. Calculate using the Parkland formula for fluid resuscitation:

   4 ml × 82 kg × 63 = 20,664 ml in 24 hours

   According to the Parkland formula, half the calculated volume of Lactated Ringer's solution is to infuse in the first 8 hours; one fourth is to infuse in the second 8 hours; and one fourth is to infuse in the remaining 8 hours.

4. The injury occurred at 0600; the first 8 hours will end at 1400. Therefore, the client should receive one half the total amount or 10,332 ml.

The Consensus Formula

Here's how you use the Consensus formula (for comparison with use of the Parkland formula):

Consensus formula:

Ringer's Lactate or other balanced saline solution 2 ml–4 ml × kg body weight × % TBSA

Half of the amount is to be infused over the first 8 hours.

The remainder of the amount is to be infused over the next 16 hours.

CAUTION

Fluid replacement formulas are calculated from the time of injury rather than from the time of arrival in the emergency room.

With this information, what steps should you follow? The steps given here will help you calculate this if you have difficulty:

1. Calculate the TBSA using the Rule of Nines:

   arms (9% each arm) = 18% + chest (18%) + back (18%) + head (9%) = 63%

2. Convert the client's weight from pounds to kilograms:

   180 pounds ÷ 2.2 pounds (2.2 pounds = 1 kg) = 81.8 kg (rounded to 82 kg)

3. Calculate using the Consensus formula for fluid resuscitation:

   2 ml × 82 × 63 = 10, 332 ml

   4 ml × 82 × 63 = 20,664 ml

   On the low end (2 ml), the amount to infuse over 24 hours would be 10,332 ml, with half to be infused in the first 8 hours and the remainder to be infused over the next 16 hours.

   On the high end (4 ml), the amount to infuse over 24 hours would be 20,664 ml, with half to be infused in the first 8 hours and the remainder to be infused over the next 16 hours.

Additional Interventions

These additional interventions are taken after assessment of airway and establishing IV access for fluid replacement. Airway and maintaining fluid volume take priority over all the other interventions:

- Administering a tetanus booster
- Inserting a urinary catheter for determining hourly output
- Inserting a nasogastric tube attached to low suction to minimize aspiration

NOTE

Enteral feedings are usually instituted within the first 24 hours to meet the client's increased caloric needs and maintain the integrity of the intestinal mucosa thereby minimizing systemic sepsis.

- Elevating burned extremities to lessen edema formation

The Intermediate Phase

The intermediate phase of burn care begins about 48–72 hours following the burn injury. Changes in capillary permeability and a return of osmotic pressure bring about diuresis or increased urinary output. If renal and cardiac functions do not return to normal, the added fluid volume, which prevented hypovolemic shock, might now produce symptoms of congestive heart failure. Assessment of central venous pressure provides information regarding the client's fluid status.

NOTE

The central venous pressure (CVP) is read with the client in a supine position with the manometer level with the fourth intercostal space midaxillary line (often referred to as the *phlebostatic axis*). The normal CVP varies but the general range is between 5–12 mm H_2O. Increased CVP indicates fluid volume overload; decreased CVP indicates fluid volume deficit.

Additional complications found during the intermediate phase include infections, the development of Curling's ulcer, paralytic ileus, anemia, disseminated intravascular coagulation, and acute respiratory failure.

NOTE

Infections represent a major threat to the post-burn client. Bacterial infections (*staphylococcus, proteus, pseudomonas, escherichia coli,* and *klebsiella*) are common due to optimal growth conditions posed by the burn wound; however, the primary source of infection appears to be the client's own intestinal tract. As a rule, systemic antibiotics are avoided unless an actual infection exists.

During the intermediate phase, attention is given to removing the eschar and other cellular debris from the burned area. *Debridement*, the process of removing eschar, can be done placing the client in a tub or shower and gently washing the burned tissue away with mild soap and water or by the use of enzymes, substances that digest the burned tissue. Santyl (collagenase) is an important debriding agent for burn wounds.

CAUTION

Enzymatic debridement should not be used for burns greater than 10% TBSA, for burns near the eyes, or for burns involving muscle.

Following debridement, the wound is treated with a topical antibiotic and a dressing is applied (more on dressings is covered in the next section). Commonly used topical antibiotics include

silver sulfadiazine (Silvadene); mafenide acetate (Sulfamylon); and silver nitrate, which can be used in an aqueous solution of 0.5% or Acticoat, a prepared dressing impregnated with silver nitrate. Silver nitrate has bacteriostatic properties that inhibit bacterial growth. Mafenide acetate, although painful, is useful in preventing *Pseudomonas* infections. Silvadene cools and soothes the burn wound but does not prevent infection.

Dressings for Burns

Dressings for burns include standard wound dressings (sterile gauze) and biologic or biosynthetic dressings (grafts, amniotic membranes, cultured skin, and artificial skin).

Standard Wound Dressings

The use of standard wound dressings makes the client more comfortable by preventing exposure of the wound to air. These dressings are usually applied every shift or once a day.

Biologic or Biosynthetic Dressings

Biologic dressings are obtained from either human tissue (homograft or allograft) or animal tissue (heterograft or xenograft). These dressings, which are temporary, are used for clients with partial thickness or granulating full thickness injuries. The type of biologic dressing used depends on the type of wound and availability of the graft.

Homografts or allografts are taken from cadaver donors and obtained through a skin bank. These grafts are expensive and there is a risk of blood-borne infection. Heterografts or xenografts are taken from animal sources. The most common heterograft is pigskin because of its compatibility with human skin.

CAUTION

Certain religious and ethnic groups would be offended if offered a porcine (pigskin) graft.

Amniotic membrane is used for full thickness burns because it adheres immediately to the wound. It is also an effective covering for partial thickness burns until reepithealization occurs. Amniotic membrane is low in cost, and its size allows for coverage of large wounds.

Cultured skin can be obtained by using a biopsy of epidermal cells taken from unburned portions of the client's body. The cells are grown in a laboratory and grafted to generate permanent skin. The process is long and costly, and extreme care is needed to prevent damage and loss of the graft.

Artificial skin (Integra) made of synthetic material and animal collagen becomes a part of the client's skin. The graft site is pliable, there is less hypertrophic scarring, and its use is helping

to eliminate the need for compression dressings like the Jobst garment during the rehabilitative phase of care.

Permanent grafts include the autograft or skin transferred from an unburned area of the client's body to the burn wound. The client generally experiences more pain from the donor site than from the burn wound because the donor site has many pain receptors. The client should receive pain medication, and both the donor site and graft site should be carefully monitored for signs of infection.

The Rehabilitative Phase

The last stage in caring for a client with burn injury is the rehabilitative stage. Technically, this stage begins with closure of the burn and ends when the client has reached the optimal level of functioning. In actuality, it begins the day the client enters the hospital and can continue for a lifetime. In the emergent and intermediate phases, the focus is on establishing and maintaining physiological equilibrium. In the rehabilitative phase, the focus is on helping the client return to preinjury life. If that is not possible, the focus is on helping the client adjust to the changes the injury has imposed.

Diagnostic Tests for Review

The following are routine tests done on most all hospital admissions. For this client, it is a way of monitoring the hemodynamic changes (development of anemia and so on) as well as changes in renal function. The chest x-ray lets the nurse know whether there has been an inhalation injury, a development of pneumonia, changes associated with ARDS, and so on. The complete metabolic panel gives information on electrolyte status, guiding the type of IV fluid to use, as well as whether additional electrolytes are needed. Here are the tests that should be performed:

- CBC
- Complete metabolic panel
- Urinalysis
- Chest x-ray

Pharmacology Categories for Review

A client with burn injuries is particularly vulnerable to infection because he has lost the first line of defense, the skin. In fact, post-burn infection is a major cause of morbidity and mortality; therefore, it is helpful to review topical antibiotics used to treat those with burns. Other

complications of burns include anemia and stress ulcers. A review of medications used to treat anemia as well as medications to prevent ulcers and the bleeding that can occur will be helpful. Narcotic analgesics—particularly opiate derivatives—are used in controlling pain and providing sedation during the emergent and intermediate phases of burn care. A review of these categories, as seen in the following list, will better prepare you to care for a client with burns:

- Topical antibiotics
- Antianemics
- Antacids
- Narcotic analgesics

Exam Prep Questions

1. The nurse is caring for a client with an electrical burn. Which structures have the greatest risk for soft tissue injury?

   ❍ **A.** Fat, tendons, and bones

   ❍ **B.** Skin and hair

   ❍ **C.** Nerves, muscle, and blood vessels

   ❍ **D.** Skin, fat, and muscle

2. Which laboratory result would be expected during the emergent phase of a burn injury?

   ❍ **A.** Glucose 100 mg/dl

   ❍ **B.** Potassium 3.5 mEq/l

   ❍ **C.** Sodium 142 mEq/l

   ❍ **D.** Albumin 4.2 gm/dl

3. An African American client is admitted with full thickness burns over 40% of his body. In addition to the CBC and complete metabolic panel, the physician is likely to request which additional bloodwork?

   ❍ **A.** Erythrocyte sedimentation rate

   ❍ **B.** Indirect Coombs

   ❍ **C.** C reactive protein

   ❍ **D.** Sickledex

4. A client weighing 76 kg is admitted at 0600 with a TBSA burn of 40%. Using the Parkland formula, the client's 24-hour intravenous fluid replacement should be:

   ❍ **A.** 6,080 ml

   ❍ **B.** 9,120 ml

   ❍ **C.** 12,160 ml

   ❍ **D.** 15,180 ml

5. On the third post-burn day, the nurse finds that the client's hourly urine output is 26 ml. The nurse should continue to assess the client and notify the doctor for an order to:

- ❍ **A.** Decrease the rate of the intravenous infusion.
- ❍ **B.** Change the type of intravenous fluid being administered.
- ❍ **C.** Change the urinary catheter.
- ❍ **D.** Increase the rate of the intravenous infusion.

6. A Jewish client requires grafting to promote burn healing. Which graft is most likely to be unacceptable to the client?

- ❍ **A.** Isograft
- ❍ **B.** Autograft
- ❍ **C.** Homograft
- ❍ **D.** Xenograft

7. During the rehabilitative phase, the client's burns become infected with *pseudomonas*. The topical dressing most likely to be ordered for the client is:

- ❍ **A.** Silver sulfadiazine (Silvadene)
- ❍ **B.** Poviodine (Betadine)
- ❍ **C.** Mafenide acetate (Sulfamylon)
- ❍ **D.** Silver nitrate

8. The CVP reading of a client with partial thickness burns is 6 mm H_2O. The nurse recognizes that the client:

- ❍ **A.** Needs additional fluids
- ❍ **B.** Has a normal CVP reading
- ❍ **C.** May show signs of congestive failure
- ❍ **D.** Would benefit from a diuretic

9. The physician has prescribed Protonix (pantoprazole) for a client with burns. The nurse recognizes that the medication will help prevent the development of:

- ❍ **A.** Curling's ulcer
- ❍ **B.** Myoglobinuria
- ❍ **C.** Hyperkalemia
- ❍ **D.** Paralytic ileus

10. The nurse has just completed the dressing change for a client with burns to the lower legs and ankles. The nurse should place the client's ankles in which position?

- ❍ **A.** Internal rotation
- ❍ **B.** Abduction
- ❍ **C.** Dorsiflexion
- ❍ **D.** Hyperextension

Answer Rationales

1. Answer A is correct. Fat, tendon, and bone have the most resistance. The higher the resistance, the greater the heat generated by the current, thereby increasing the risk for soft tissue injury. Answer B has intermediate resistance, so it is incorrect. Answer C is incorrect because it has very low resistance. Answer D has low to intermediate resistance, so it is incorrect.

2. Answer A is correct. Glucose levels rise as a result of the stress response during the emergent phase. Answers B, C, and D are within normal range. K+ and Na+ would be elevated, whereas albumin would be lowered during the emergent period due to increased permeability.

3. Answer D is correct. Sickle cell anemia and sickle cell trait are more prevalent in African American clients. The Sickledex test detects the presence of sickle cell anemia and sickle cell trait. Trauma can trigger a sickle cell crisis, which would complicate the treatment of the client. Answers A and C indicate inflammation, so they are incorrect. Answer B is incorrect because it detects circulating antibodies against RBCs.

4. Answer C is correct. The Parkland formula is 4 ml × kg × TBSA = 24-hr. fluid requirement, or 4 × 76 × 40 = 12,160 ml. Answer A is the fluid requirement for the first 8 hours after burn injury, so it's incorrect. Answer B is incorrect because it's the fluid requirement for 16 hours after burn injury. Answer D is an excessive amount given the client's weight and TBSA, so it's incorrect.

5. Answer D is correct. The urinary output should be maintained between 30 ml and 50 ml per hour. The first action should be to increase the IV rate to prevent increased acidosis. Answer A would lead to diminished output, so it is incorrect. There is no indication that the type of IV fluid is not appropriate as is suggested by answer B, making it incorrect. Answer C would not increase the client's output and would place the client at greater risk for infection, so it is incorrect.

6. Answer D is correct. Xenografts are taken from nonhuman sources. The most common sources are porcine, or pigskin, which would be offensive to both Jews and Muslims. Answer A refers to a graft taken from an identical twin, making it incorrect. Answer B

is incorrect because it refers to a graft taken from the client's own skin. Answer C refers to a graft taken from a cadaver, making it incorrect.

7. Answer C is correct. Sulfamylon is effective in treating wounds infected with *pseudomonas*. The client should receive pain medication prior to dressing changes because the medication produces a burning sensation when applied to the wound. Answers A, B, and D are incorrect because they are used in the treatment of burns but are not effective against *pseudomonas* infections.

8. Answer B is correct. The normal CVP reading is 5–12 mm H_2O. Answer A is incorrect because the client does not need additional fluids. Answers C and D would be appropriate only if the CVP reading were greater than 12 mm H_2O.

9. Answer A is correct. Curling's ulcer, a stress ulcer, is a common occurrence in clients with burns. Protonix, a proton pump inhibitor, is effective in preventing ulcer formation. Answers B, C, and D are common in clients with burns but are not prevented by the use of Protonix, so they are incorrect.

10. Answer C is correct. Placing the ankles in dorsiflexed position helps prevent contractures. Answers A, B, and D will lead to contractures that may require surgical intervention, so they are incorrect.

Suggested Reading and Resources

- Ignatavicius, D. and Workman, S. *Medical Surgical Nursing: Critical Thinking for Collaborative Care*, 5th ed. Philadelphia: Mosby, 2006.
- Brunner, L. & Suddarth, D. *Textbook of Medical Surgical Nursing*, 10th ed. Philadelphia: Lippincott Williams & Wilkins, 2006.
- Burn Recovery Center: www.burn-recovery.org.