Overview

A *burn* is a tissue injury that occurs when there is contact between tissue and an energy source such as heat, flame, chemicals, electrical current, or radiation. The severity of a burn is determined by the depth, extent, and location of the burn in addition to the patient risk factors. Severe burns can cause an increase in capillary permeability with resultant fluid and electrolyte shifts, leading to edema and hypovolemic shock. Burns can be classified into three phases. The *emergent (resuscitative)* phase is the period required to resolve the immediate, life-threatening problems resulting from the burn injury. The *acute (wound healing)* phase begins with the mobilization of extracellular fluid and subsequent diuresis. This phase is concluded when the burned area is completely covered by skin grafts or when the wounds are healed. The *rehabilitative (restorative)* phase begins when the patient's burn wounds have healed and the patient is engaging in some level of self-care.

Objectives

- Identify relevant assessment data for a patient with a burn injury.
- Analyze results of diagnostic studies for a patient with a burn injury.
- Prioritize nursing care for a patient with a burn injury.
- Describe interprofessional care of a patient with a burn injury, including fluid replacement therapy and wound management.
- Appropriately delegate nursing care of a patient with a burn injury.

Case Study

P.B., a 56-year-old housewife and grandmother, is admitted to the emergency department by ambulance with burns sustained when her gas furnace exploded while she was relighting a pilot light. She is awake and oriented but very agitated and frightened and cannot remember the accident. She is having severe pain in her face and upper chest. She is shivering and complains of being cold, and her voice is raspy. Her hair and eyebrows are singed, and she has mixed areas of red, fluid-filled vesicles and waxy, white skin involving her face, anterior neck, all her right arm, dorsal aspect of her left arm, and anterior chest and abdomen. Her heart rate is 132 beats/min, respiratory rate is 36 breaths/min, and a thigh blood pressure is 110/52 mm Hg. P.B.'s past medical history is positive for a myocardial infarction at age 50 with resultant chronic heart failure. Her current medications are as follows: quinapril (Accupril) 20 mg daily, furosemide (Lasix) 20 mg daily, and atorvastatin 40 mg daily.

Question 1: As you initiate care for P.B., you realize the importance of prioritizing activities during this emergent phase. Sequence the activities below according to priority. 1 = first, 2 = second, etc.

A. Administer IV morphine.	1.
B. Administer IV fluids.	2.
C. Administer 100% humidified O_2.	3.
D. Administer tetanus prophylaxis.	4.
E. Establish an IV access.	5.
F. Initiate appropriate wound care.	6.
G. Insert an indwelling urinary catheter.	7.
H. Prepare for nasotracheal or endotracheal intubation.	8.
I. Estimate body surface area burned.	9.

Question 2: In the emergency department you carefully assess and observe P.B. Which finding would be *most* concerning?

A. Urine output of 20 mL/hr
B. Edema formation in the upper airway
C. Pulmonary embolism resulting from inhalation injury
D. Development of hypothermia resulting from fluid evaporation from open wounds

Scenario: Fluid replacement is initiated for P.B. using the Parkland formula. She reports that she weighs about 120 lb. To monitor and evaluate her fluid replacement, you review the formula for estimating the rate of fluid replacement.

Question 3: Using the rule of nines chart, you estimate the extent of deep partial-thickness and full-thickness burns as ___%.

A. 22
B. 30
C. 36
D. 44

Question 4: You calculate that P.B. should receive about _____ mL of fluid in the first 8 hours after the time of injury.

A. 1800
B. 3900
C. 4300
D. 7800

Question 5: As fluid therapy is being initiated for P.B., you monitor her condition closely. You prioritize assessment for which complication during this period?

A. Infection
B. Contractures
C. Pulmonary edema
D. Compartment syndrome

Question 6: P.B. rapidly develops edema in burned and nonburned areas. You realize that her edema

A. may lead to hypovolemic shock as a result of intravascular volume depletion.

B. results from hypervolemia that occurs with fluid replacement therapy.

C. is an indication of renal ischemia and acute tubular necrosis caused by sludging.

D. is caused by decreased hydrostatic pressure resulting in fluid retention in the vasculature.

Question 7: After starting fluid replacement via a subclavian central catheter, the health care provider orally intubates P.B. She is transferred to the burn unit where an arterial line and small-bore nasogastric tube are placed. Her facial burns will be treated with the open method while the rest of her burns will be treated with impregnated sterile gauze dressings. Select all the appropriate interventions you would plan for P.B. during this emergent phase of her burns. There are 10 correct answers.

A. Elevate her arms on pillows in a flexed position.

B. Assess her blood pressure with a thigh cuff q1hr.

C. Monitor her weight daily.

D. Initiate active and passive range-of-motion (ROM) exercises to her arms and neck.

E. Place pillows under her head for comfort.

F. Establish a method of communication for P.B. to express her needs.

G. Use sterile gloves to apply topical antimicrobial agents to the wounds.

H. Administer high-caloric, high-protein enteral tube feedings.

I. Administer IV pain medication 1 to 2 hours before wound care.

J. Monitor her urinary output each shift.

K. Keep the room at 85°F (29.4°C).

L. Instill artificial tears as needed.

M. Wear disposable cap, mask, gown, and gloves when providing direct patient care.

N. Monitor mental status and pulmonary function every 1 to 2 hours.

O. Apply SCDs to lower extremities

Question 8: During the emergent phase when P.B. is intubated, she becomes very agitated and anxious, groping around with her arms. You may alleviate her distress by

A. giving her a familiar object to hold.

B. administering her ordered analgesic.

C. providing her with a pen and paper to be able to write her needs.

D. explaining that she will be able to see when the edema decreases.

Question 9: Twenty-four hours after P.B.'s admission to the burn unit, eschar begins to develop over her burned areas. You monitor the radial pulse in her right arm, recognizing that an escharotomy may be indicated to prevent

A. Contractures

B. Excessive edema

C. Ischemia and necrosis

D. Infection

Question 10: Select the correct answer for each statement.

Lab Findings	**Emergent Phase**	**Acute Phase**
Hct 40%		
Urine specific gravity 1.038		
Serum K 6.1 mEq/L (6.1 mmol/L)		
Serum 3.6 mEq/L (3.6 mmol/L)		
Urine specific gravity 1.018		
Hct 54%		

Question 11: Because of the location of P.B.'s burns and the treatment required, she is taken to the operating room for surgical debridement of her wounds. Most of her chest and arm burns are deep partial-thickness burns, and about 30% of the burns on her face and abdomen are full-thickness burns. The physician applies sheet autografts from her thighs to the areas of full-thickness burns. Which teaching statements would be appropriate for the nurse to tell P.B.? *(Select all that apply.)*

A.	"The skin grafts will help limit scars from forming."
B.	"I will be checking your grafts frequently to make sure there are clots present to prevent bleeding."
C.	"The surgeon scraped all the dead tissue off the burned areas before applying the grafts."
D.	"The new skin grafts will help control your pain."
E.	"The dressings on the donor sites will need to remain in place for 10-14 days."

Question 12: In the acute phase of burn management, P.B. is at risk for stress-related complications. You carefully monitor her for signs and symptoms of [ ] ulcer and an increase in serum [ ] levels.

Calcium Curling's Glucose Pressure

Question 13: You are working with unlicensed assistive personnel (UAP). Which nursing activities included in the plan of care are *best* delegated to UAP? *(Select all that apply.)*

A. Empty and record P.B.'s hourly urine output.

B. Reapply sequential compression devices following P.B.'s bath.

C. Assess P.B.'s pain relief following administration of morphine.

D. Administer subcutaneous insulin based on P.B.'s capillary blood glucose reading.

E. Perform capillary blood glucose monitoring.

F. Perform the dressing changes on P.B.'s graft sites.

Question 14: P.B.'s endotracheal tube is removed as her edema subsides, but she is withdrawn and refuses to participate in activities of daily living (ADLs). She tells you that she would rather die than look like she does. The *best* approach to use in helping P.B. with her grieving is to

A. encourage her to talk about her fears regarding her disfigurement and loss of function.

B. assure her that as the wounds heal, she will have little to no scarring or deformity.

C. encourage her family to visit frequently and tell her that her appearance isn't important.

D. explain that if she doesn't perform the prescribed exercises and activities, contractures will develop that will limit her function even more.

Case Study Conclusion

Thanks to vigilant, competent, and compassionate nursing care, P.B.'s burns are healing without complications. The autografts and donor sites are without infection and demonstrate excellent color and circulation. P.B.'s cardiopulmonary status is stable, and she is able to be out of bed and participate in her activities of daily living (ADLs). P.B. is transferred to an inpatient rehabilitation center for physical and occupational therapy.