

# Certified Hyperbaric and Wound Care Specialist

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1. A patient complains of unrelenting, burning pain 4 hours after the application of a chemical debriding agent. The nurse should understand that wound pain may:

- A. Lead to wound hypoxia, which impairs wound healing and increases infection rates
- B. Stimulate fibroblast production and contribute to granulation tissue formation
- C. Initiate the healing cascade, which leads to contraction and epithelialization
- D. Decrease wound inflammation, which could limit wound phase progression

2. Which of the following is an appropriate intervention for stage I pressure ulcers?

- A. Reposition the patient frequently
- B. Use a donut-type device
- C. Massage the reddened area
- D. Keep the head of the bed elevated

3. How often should a transparent film dressing covering a dermal ulcer be changed?

- A. Every day
- B. Every 8 hours
- C. When fluid collects over the lesion
- D. When fluid extends beyond wound edges

4. A decompression sickness patient with neurological compromise is responding to recompression and oxygen at 60 FSW. However, upon completion of the third oxygen breathing cycle it is noted that resolution of the patient's symptoms is incomplete. The most appropriate management would be to:

- A. Extend the Treatment Table
- B. Complete a Treatment Table 6 and re-treat immediately
- C. Complete a Treatment Table 6 and observe
- D. Recompress to 165 FSW on air

5. Which of the following factors is NOT likely to contribute to developing a postoperative complication of wound dehiscence?

- A. Corticosteroids
- B. Diabetes
- C. Hypertension
- D. Morbid obesity
- E. Smoking

6. Which of the following is the definition of Surface Interval?

- A. The time from the beginning of the first decompression to the end of the second compression
- B. The time from the end of the first decompression to the beginning of the second compression
- C. The time from the beginning of the first compression to the beginning of the second compression
- D. The time from the end of the first compression to the end of the second compression
- E. The time from the end of the first decompression to the end of the second compression

7. Decompression sickness is very rare when diving shallower than:

- A. 130 fsw
- B. 100 fsw
- C. 45 fsw
- D. 30 fsw
- E. 14.7 fsw

8. According to Boyle's Law, assuming a constant temperature, the volume and pressure of a gas are:

- A. Unrelated
- B. Exponentially related
- C. Inversely proportional
- D. Directly proportional
- E. Additive

9. During a routine treatment, a patient complains of chest pain and shortness of breath. The primary response of the chamber operator is to:

- A. Give the patient an air break
- B. Immediately notify the hyperbaric physician of the patient's condition
- C. Begin to decompress the chamber at a rate of 5 psi/min
- D. Call the hospital code team

10. Apligraf® and Dermagraft® are skin substitutes that are similar in that they both contain:

- A. Keratinocytes
- B. Fibroblasts
- C. Stem cells
- D. Langerhans's cells
- E. Macrophages

11. The substance produced by Clostridium organisms which can cause muscle necrosis, hemolysis and shock is called:

- A. Alpha toxin
- B. Beta toxin
- C. Tumor necrosis factor
- D. Betahemolytic strep
- E. Gammaglobulin

12. Documentation that must be completed for every treatment to ensure compliance with reimbursement requirements for an individual receiving hyperbaric therapy include all of the following EXCEPT:

- A. Time of oxygen breathing under pressure
- B. Depth of treatment
- C. Signed consent
- D. Diagnosis
- E. Date of treatment

13. The major risk when trying to force a Valsalva maneuver to clear the ears during descent is?

- A. Nosebleed
- B. Over-pressurization of the sinuses
- C. Inner ear barotrauma
- D. Pneumo-mediastinum
- E. Cerebral arterial gas embolism

14. Thirty three feet of sea water is equivalent to:

- A. 14.7 psig
- B. 2.0 ATA
- C. 29.4 psia
- D. 1.0 ATM
- E. All of the above

15. A periwound TcPO<sub>2</sub> measurement performed inside the hyperbaric chamber at 2.0 ATA provides the best single discriminator between success and failure of hyperbaric oxygen therapy using a cutoff score of:

- A. 50 mmHg
- B. 100 mmHg
- C. 200 mmHg
- D. 500 mmHg

16. A 70-year-old woman with a recent left hip fracture has developed a Stage II pressure ulcer on her right heel. Which of the following best describes her ulcer?

- A. Nonblanchable erythema
- B. Full thickness skin loss
- C. Partial thickness skin loss
- D. Loss of skin and subcutaneous tissue

17. Radiation has a variety of destructive effects on tissue which can negatively impact wound healing. Which of the following is NOT considered a potential compromising side effect of therapeutic radiation therapy?

- A. Endothelial cell injury
- B. Collagen degradation
- C. End arteriole damage
- D. Tissue hypoxia
- E. Damage of cellular DNA

18. A patient with paraplegia has developed a pressure ulcer over the ischial tuberosity. This is the second ulcer that has developed in this exact location within the past year. Which of the following is the most likely explanation for the recurrence of the ulcer?

- A. Insufficient protein intake
- B. Ineffective wound debridement
- C. Insufficient oxygen to lower extremities
- D. Inadequate pressure reduction

19. A 45 year old paraplegic presents with a stage IV pressure ulceration. Exposed bone and muscle is noted. She has a low grade fever but no evidence of cellulitis. Appropriate initial management includes all of the following EXCEPT:

- A. Pressure redistribution
- B. Nutritional support
- C. Antibiotic therapy
- D. Surgical debridement
- E. Admission and tissue flap closure

20. The chamber operator compressed the chamber to 60 FSW at 1 foot per second and secured (closed) the supply and exhaust valves. The chamber pressure leveled for a moment and then slowly began losing pressure. There were no significant leaks in the system. What is the most likely explanation of the pressure change?

- A. Temperature change. Warming the chamber causes a decrease in pressure.
- B. No known reason.
- C. Poor operator technique in selecting an improper descent rate.
- D. Temperature change. Cooling the chamber causes a decrease in pressure.

21. Which of the following are appropriate products that can be used to clean and disinfect the interior of a monoplace chamber?

- A. Normal Saline
- B. Pine-Sol
- C. Tor-HB
- D. Hospital alcohol pads
- E. All of the Above

22. During a routine treatment at 3 ATA the attendant must be decompressed. Using the U. S. Navy Standard Air Decompression Tables, which depth table would be used to determine the decompression obligation?

- A. 60
- B. 66
- C. 70
- D. 100

23. Common findings in patients with lower extremity arterial ulcers include all of the following EXCEPT:

- A. Skin pallor
- B. Paucity of hair
- C. Swelling
- D. Decreased capillary refill
- E. Absent palpable pulses

24. Approximately how long does it take to reach a treatment depth of 3.0ATA if the hyperbaric chamber is compressed at 5psi/minute?

- A. 4 minutes
- B. 5 minutes
- C. 6 minutes
- D. 10 minutes
- E. 15 minutes

25. Which of the following has the most beneficial effect on the healing of venous leg ulcers?

- A. High protein diet
- B. Reduction of edema
- C. Non-selective debridement
- D. Increased calcium intake

26. The rationale for using hyperbaric oxygen in treating patients with a diagnosis of gas gangrene include all of the following EXCEPT:

- A. HBO is bactericidal to other bacteria in wounds
- B. Inhibits production of alpha toxin
- C. Aids in demarcation of healthy from nonviable tissue
- D. Enhances antibiotic effectiveness
- E. Eliminates the need for surgical intervention

27. Which of the following maneuvers provides little help in attempting to equalize the pressure in the ears during compression?

- A. Crying
- B. Yawning
- C. Swallowing
- D. Blowing your nose
- E. Pulling the earlobe downward

28. In bed bound adults the most common location for pressure ulcers formation is:

- A. Scapula
- B. Sacrum
- C. Lateral malleolus
- D. Heel

29. Regarding personal protective equipment and Infection Control Standards, which of the following statements is INCORRECT?

- A. When personal protective equipment is removed, it should be placed in an appropriately designated area or container for storage, washing, decontamination, or disposal.
- B. Surgical or examination gloves may be washed or decontaminated for reuse if the integrity of the glove has not been compromised.
- C. Masks in combination with eye protection devices must be worn whenever splashing of blood or other potentially infectious material is likely.
- D. Personal protective equipment must be worn whenever working with a patient identified as having a wound colonized with MRSA or VRE.

30. All of the following are benefits of hyperbaric oxygen in the treatment of decompression sickness EXCEPT:

- A. Increased counter-diffusion gradient at the bubble
- B. Oxygenation of hypoxic tissues
- C. Enhanced proinflammatory cytokines
- D. Reduction of tissue edema

31. The half-life for CO elimination at normobaric pressure on 100% oxygen is:

- A. 23 minutes
- B. 45 minutes
- C. 1 hour and 20 minutes
- D. 5 hours and 20 minutes

32. A TCPO<sub>2</sub> and a CPP (capillary perfusion pressure) of 50mm Hg are considered:

- A. Adequate for healing
- B. Marginal ischemia or slight impairment
- C. Severe Ischemia
- D. CLI critical limb ischemia
- E. Inconsistent readings and need to be repeated

33. Symptoms that can be related to intracranial abscess include all of the following EXCEPT:

- A. Sudden violent headache
- B. Generalized petechial rash
- C. Nausea and vomiting
- D. Seizures

34. The priority for the safety of individuals involved in a fire in the monoplace hyperbaric chamber should follow this order.

- A. Patient inside the chamber, other patients in the chamber area, hyperbaric staff
- B. Patient inside the chamber, hyperbaric staff, other patients in the chamber area
- C. Other patients in the chamber area, hyperbaric staff, patient inside the chamber
- D. Other patients in the chamber area, patient inside the chamber, hyperbaric staff

35. Which of the following statements is MOST accurate related to collagen synthesis and tissue oxygen tension?

- A. Collagen is produced by fibroblasts at tissue oxygen tensions measuring 15mmHg
- B. Collagen is produced by fibroblasts at tissue oxygen tensions measuring 25mmHg
- C. Collagen is produced by fibroblasts at tissue oxygen tensions measuring 35mmHg
- D. Collagen is produced by osteoblasts at tissue oxygen tensions measuring 25mmHg
- E. Collagen is produced by osteoblasts at tissue oxygen tensions measuring 35mmHg

36. Which person from the hyperbaric department is responsible for overseeing the maintenance procedures and ensuring the chamber is run safely?

- A. Program Medical Director
- B. Hyperbaric Safety Director
- C. Fire Marshall
- D. All Chamber Technicians share responsibility

37. Which of the following topical preparation are most commonly used in hyperbaric patients?

- A. Sulfamylon due to its vasodilatory effect
- B. Silver sulfadiazine (Silvadene) due to the fact that it has no vasodilatory effect
- C. Neosporin due to the petroleum base there is less fluid loss through the burned area
- D. All of the above



38. Mr. Smith has a stage IV pressure ulcer with a large amount of necrotic tissue. The best method of debridement for this wound is:

- A. Mechanical
- B. Sharp surgical
- C. Chemical
- D. Autolysis

39. A patient that is breathing 100% oxygen at 2.8 ATA will have an arterial oxygen tension of approximately:

- A. 760 mmHg
- B. 1540 mmHg
- C. 2200 mmHg
- D. 4000 mmHg
- E. Too high for oximeters to measure

40. Which of the following is the most accurate method to assess resuscitation adequacy?

- A. Preburn body weight
- B. Blood pressure
- C. Cardiac output
- D. Urine output

41. The most common side effect of multiplace hyperbaric oxygen therapy when used for the treatment of chronic wounds is:

- A. Claustrophobia
- B. Barotrauma
- C. Oxygen toxicity seizures
- D. Air gas embolism
- E. Vision changes

42. When treating a patient with smoke inhalation, it is important to realize that tracheal mucosal sloughing causing copious secretions could be delayed up to:

- A. 12 to 14 hours
- B. 24 to 48 hours
- C. 48 to 72 hours
- D. No delay

43. All of the following medications are generally considered safe under hyperbaric conditions EXCEPT?

- A. Heparin, Insulin, and Vitamin E
- B. Lidocaine, Alcohol and Non-narcotic analgesics
- C. Cis-Platinum, Doxorubicin, and Bleomycin
- D. Barbiturates, Digitalis, and Steroids

44. A pressure ulcer on the heel presents as a blister filled with yellow fluid. Using the NPUAP staging system, this is best classified as:

- A. Stage I
- B. Stage II
- C. Suspected deep tissue injury
- D. Unstageable
- E. Stage III

45. Tissue damage due to radiation injury is primarily due to:

- A. Dilation of blood vessels
- B. Hypovascular, hypocellular and hypoxic changes
- C. Up regulation of growth factors
- D. Increased cellular mitosis

46. Which of the following statements is BEST practice when caring for a critically ill patient in a multiplace chamber at depths greater than 60 FSW?

- A. The physician outside of the chamber should make medical decisions concerning the patient
- B. The chamber operator should make the medical decisions concerning the patient
- C. The medical attendant inside the chamber should make the medical decisions concerning the patient
- D. The physician should lock into the chamber before making medical decisions

47. What is the maximum concentration of oxygen that can be safely administered for an extended period of time (greater than 24 hours) without incurring clinically significant toxic effects?

- A. 20%
- B. 40%
- C. 60%
- D. 80%
- E. 100%

48. A spherical balloon is inflated to 5 liters volume at 150 fsw. What would be the resulting volume if the unvented balloon is decompressed to 100 fsw?

- A. 3.5 liters
- B. 4.6 liters
- C. 5.7 liters
- D. 6.9 liters
- E. 7.5 liters

49. All of the following conditions may increase the risk of events related to decompression and increased susceptibility toward bends for inside attendants EXCEPT?

- A. Alcohol
- B. Exercise
- C. Fever
- D. Flying before diving
- E. Illness

50. Which of the following is NOT correct regarding evaluation of breath sounds?

- A. Breath sounds should be compared from side to side
- B. Breath sounds should not be auscultated through a patient's clothing since fabric can cause sound distortion
- C. The bell of the stethoscope should be used for listening to the lungs when breath sounds are quiet as the bell best amplifies the sound
- D. It is best to instruct the patient to breathe slowly and deeply through an open mouth
- E. Abnormal breath sounds should be reported to the physician prior to the treatment

51. Which items may be safely be allowed in the monoplace chamber with the patient?

- A. Wristwatch
- B. Eye glasses (without hearing aid)
- C. I-Pod (operating on battery)
- D. Magazines or books
- E. Drinking water

52. Use of compression therapy to treat a venous ulcer is CONTRAINDICATED in a patient with:

- A. Heavy exudate
- B. Fibrin slough
- C. Peripheral edema
- D. Arterial insufficiency

53. What is the recommended maximum safe exposure time for breathing oxygen continuously at 66 FSW?

- A. 15 minutes
- B. 30 minutes
- C. 45 minutes
- D. 90 minutes
- E. 120 minutes

54. During decompression, bubbles form most commonly in which tissue structure?

- a. Arteries
- b. Veins
- c. Adipose
- d. Muscle
- e. Bone & Joints

55. Your patient arrests inside of a monoplace chamber. He is unconscious and in ventricular fibrillation. As chamber operator what precautions must you advise should be taken upon reaching the surface before defibrillating the patient?

- A. Move the patient at least 6 feet from the opening of the chamber
- B. Removing the patient's clothing
- C. Moving the patient off of the chamber stretcher
- D. All of the Above

56. Close monitoring of blood sugar levels should be performed:

- A. In all patients receiving HBOT
- B. In all diabetic patients receiving HBOT
- C. Only in insulin dependent patients receiving HBOT
- D. Only when trying to distinguish between an oxygen toxicity and hypoglycemic seizure
- E. Monitoring is only required when patients HgA1C exceeds 10%

57. During a treatment, the oxygen sensor alarm sounds to indicate an elevated oxygen level inside the multi-place chamber. What is the most likely source of oxygen leak into the chamber?

- A. Patient's hood
- B. Inside attendant's mask
- C. Oxygen monitor
- D. Compressor

58. What is considered to be the optimal range of tissue oxygen tensions that allows typical leukocytes function normally?

- A. 80-100 mmHg
- B. 60-70 mmHg
- C. 30-40 mmHg
- D. 10-20 mmHg
- E. 5-10mmHg

59. CNS oxygen toxicity can manifest as all of the following EXCEPT:

- A. Vertigo
- B. Facial twitching
- C. Convulsions
- D. Epistaxis

60. A diver complains of sub-sternal pressure-type pain, nausea, and diaphoresis following a rapid ascent. There is no complaint of shortness of breath. Which of the following conditions is most concerning and likely to be causing the patient distress?

- A. Gastric distention from air over-expansion
- B. Subcutaneous emphysema
- C. Mediastinal emphysema
- D. Pneumothorax
- E. Pneumonia

61. Barotrauma is NOT typically diagnosed in which type of tissue?

- A. Ears
- B. Lungs
- C. Teeth
- D. Sinuses
- E. Bone

62. Which statement best describes the care of surgical drains, foley catheters and nasogastric tubes during hyperbaric therapy?

- A. These devices are not allowed in the hyperbaric chamber
- B. All should be removed before commencing treatment
- C. Should be emptied before treatment and then left open to drain
- D. Must be clamped and sealed tightly to prevent fluids from draining from the patient during HBO treatment

63. A completely filled 71.2 cu. ft. SCUBA bottle contains 3000 psig at 80°F. Left in the sun, the bottle temperature increases to 105°F. What will the new tank pressure be?

- A. 3300 psig
- B. 2861 psig
- C. 3000 psig
- D. 3139 psig
- E. 4095 psig

64. Because of the toxic effects on the central nervous system, pure oxygen breathing is restricted in use to which of the following pressures?

- A. 1 ATA or less
- B. 2 ATA or less
- C. 3 ATA or less
- D. 5 ATA or less
- E. 10 ATA or less

65. The comprehensive publication which addresses fire safety standards for hyperbaric health care facilities is:

- A. CGA-540
- B. CMS Pub 30-10
- C. U.S. Navy Diving Technical Manual
- D. Chapter 20, NFPA-99

66. The key layers of the skin from the external surface to the deeper layers are most accurately listed by which of the following?

- A. Epidermis, basement membrane, dermis and hypodermis
- B. Epidermis, hypodermis, basement membrane and dermis
- C. Epidermis, hypodermis, dermis and basement membrane
- D. Epidermis, basement membrane, hypodermis and dermis

67. Which of the following statements about wound care is TRUE?

- A. Hydrocolloids absorb more exudate than alginate dressings
- B. Transparent dressings are contraindicated in the presence of eschar
- C. Wound fillers can be used to fill undermining and tunnels
- D. Silver-impregnated dressings are indicated when critical colonization is suspected

68. Which of the following statements accurately characterizes colonization of a wound?

- A. Colonization is associated with a fever and local inflammation of the wound
- B. Colonization is manifested by delaying healing
- C. Colonization is diagnosed with a culture result of 10<sup>5</sup> organisms/grams of tissue or more
- D. Colonization is often present and not indicative of an infection

69. Wet to dry, hydrotherapy, irrigation and pulsatile lavage are forms of what type of debridement?

- A. Chemical
- B. Sharp/surgical
- C. Mechanical
- D. Selective debridement

70. Hyperbaric oxygen is effective in wound-healing enhancement due to which of the following physiologic mechanisms?

- A. Stimulates fibroblastic proliferation
- B. Enhances collagen production
- C. Proangiogenic
- D. Stimulates epithelialization
- E. All of the above

71. The condition in the body when the amount of inert gas in the diver's tissues is greater than the amount of inert gas in what he is breathing is called:

- A. Saturation
- B. Over-saturation
- C. Supersaturation
- D. Sub-saturation

72. What process best represents the cellular activity in the early or initial phase of wound healing?

- A. Leukocytes ingest bacteria
- B. Fibroblasts create collagen
- C. Platelets degranulate and release cytokines
- D. Macrophages release vasodilators
- E. Angiocytes from granulation tissue

73. When preparing medications for a patient receiving hyperbaric treatment in a multiplace chamber, it is generally acceptable to use glass containers:

- A. As long as they are greater than 10 ml glass vials.
- B. Even if the integrity of the multi-dose vial has been violated.
- C. As long as the glass bottle has been vented with special vented tubing.
- D. Only if the glass IV bottle has been continually vented to the air space with a long needle during any pressurization changes.
- E. Only if the manufacturer has cleared the bottle for hyperbaric exposures

74. When are the gases containing spaces in the human body at risk for barotrauma during a hyperbaric exposure?

- A. Only during ascent
- B. Only during descent
- C. Only while at depth
- D. Any time the pressure is changing

75. A person with arterial lower extremity ulcers will commonly have a history of which of the following?

- A. Dependent edema
- B. Distal paresthesia
- C. Decreased pain with leg elevation
- D. Intermittent claudication

76. The progressive destruction of the bones and joints in the foot leads to fractures. Over time, the arch collapses and a rocker bottom appearance to the foot develops. This is called:

- A. Hammer toe
- B. Diabetic neuropathy
- C. Charcots joint
- D. Claw toe

77. Which statement is MOST accurate regarding blood pressure measurements at 3 ATA inside of a hyperbaric chamber?

- A. Can only be recorded with an indwelling arterial catheter
- B. The reading reflects the difference between arterial and ambient pressure
- C. Is the same arterial pressure as measured at 1 ATA
- D. Are unreliable because of the additional chamber pressure
- E. Are unreliable because of the increased gas density

78. Which of the following is a component of the Braden Scale?

- A. Patient age
- B. Moisture
- C. Diabetic control
- D. Wound infection
- E. Arterial assessment

79. Prior to initiating hyperbaric therapy a patient gives a history of severe claustrophobia. When monitoring this patient during the treatment which of the following symptoms would NOT be characteristic of claustrophobia?

- A. Anxiety
- B. Emotional distress
- C. Diaphoresis
- D. Hyperventilation
- E. Somnolence

80. The risk of delayed radiation injury primarily depends upon which of the following?

- A. Total dose of radiation
- B. Type of neoplasm treated
- C. Concurrent chemotherapy administration
- D. Age of patient at time of treatment



81. A patient with a pressure ulcer of the right lateral malleolus is seen in the wound clinic. Examination during prior visits showed wound erythema, undermining of wound edges, and exudate. Findings at the time of the current visit show that the wound is contracting with healthy granulation tissue, reduced undermining and neodermis at the margins. Which of the following stages of wound healing BEST describes the wound today?

- A. Hemostasis
- B. Inflammation
- C. Proliferation
- D. Remodeling

82. Which of the following is NOT a step in TCOM site preparation?

- A. Shave area if necessary
- B. Mechanically remove loose, dry skin
- C. Cleanse to remove oils
- D. Apply a barrier ointment to protect skin
- E. All are appropriate steps

83. Normal sea level atmospheric pressure is?

- A. 14.7mmHg
- B. 120 mmHg
- C. 573 mmHg
- D. 600 mmHg
- E. 760 mmHg

84. Dalton's Law describes the relationship between the total pressure and the partial pressure of gases in a mixture. What is the partial pressure of oxygen in air at 2 ATA?

- a. 2.00 ATA
- b. 1.00 ATA
- c. 0.10 ATA
- d. 0.21 ATA
- e. 0.42 ATA

85. Based on the principle of Boyle's Law, changing depth is most dangerous:

- A. In fresh water as opposed to salt water
- B. Near the surface
- C. Deeper than 33 fsw
- D. Between 6 ATA and 5 ATA
- E. Between 165 fsw and 132 fsw

86. The presence of replicating microorganisms adherent to the wound in the absence of injury to the host is referred to as:

- A. Wound contamination
- B. Wound colonization
- C. Wound local infection
- D. Wound systemic infection
- E. Critical colonization

87. During multiplace chamber operations, oxygen concentration inside the chamber should not exceed:

- A. 33%
- B. 29%
- C. 23%
- D. 40%
- E. 20%

88. A female patient with metastatic breast cancer is admitted with a fungating mass that measures 12 cm x 10cm in the left breast. To assist with palliative care and pain management, the nurse should recommend applying:

- A. Wet-to-Dry dressing
- B. Petroleum-impregnated gauze
- C. Betadine gauze
- D. Enzymatic debridement ointment

89. Which of the following statements describes the operator's BEST course of action if a cardiac arrest should occur in the monoplace chamber in a non-intubated patient?

- A. Hold the patient at pressure until help arrives, no matter how long it takes. Then decompress in short bursts.
- B. Decompress immediately and as rapidly as possible. Begin CPR immediately upon surfacing. Check for signs of embolism.
- C. Decompress slowly over a ten minute period so that the patient does not develop a pneumothorax. Administer CPR.
- D. Await for the arrival of the physician to direct the patient management.

90. Which of the following is the most significant factor in healing an ischemic ulcer?

- A. Topical therapy
- B. Perfusion
- C. Nutrition
- D. Adequate debridement

91. Leukocytosis plays a key role during which of the following phases of wound healing?

- A. Inflammatory
- B. Hemostasis
- C. Proliferative
- D. Remodeling

92. The risk of hyperbaric exposure for patients with a history of asthma relates to:

- A. Local air trapping and pulmonary overpressure accident on ascent
- B. Increased toxicity of bronchodilators related to oxygen
- C. Precipitation of asthma attacks due to anxiety
- D. Pulmonary hypertension
- E. Increased risk of pneumonia

93. All of the following are appropriate indications for performing transcutaneous oxygen evaluation on a hyperbaric patient EXCEPT:

- A. Assess perfusion at the patient's wound
- B. Provide additional revenue for the hyperbaric department
- C. Evaluation of tissue response to 100% oxygen
- D. Determine the level of amputation

94. Relief valves are usually set based upon chamber's treatment depth. Which of the following best describes this setting?

- A. Set at the Maximum Treatment Depth
- B. Set at 5% below the Maximum Treatment Depth
- C. Set at 10% above the Maximum Treatment Depth
- D. Set at 25% above the Maximum Treatment Depth

95. Which of the following gas mixtures BEST describes the composition of ambient air?

- A. 50% N<sub>2</sub>, 21% O<sub>2</sub>, 29% Ar
- B. 50% N<sub>2</sub>, 50% O<sub>2</sub>
- C. 80% N<sub>2</sub>, 20% O<sub>2</sub>
- D. 78% N<sub>2</sub>, 21% O<sub>2</sub>, 1% Ar

96. What is the best agent to use when extinguishing a fire inside of a multiplace hyperbaric chamber?

- A. Heavy blankets
- B. Halogen
- C. Water
- D. Dry chemical

97. Which one of the following Braden Scale total scores would most definitely indicate that a person needed implementation of a pressure ulcer prevention protocol?

- A. 23
- B. 21
- C. 19
- D. 17
- E. 14

98. According to CMS policy, all of the following criteria must be met prior to the initiation of HBOT in the management of the diabetic foot ulcer EXCEPT?

- A. Vascular status is optimized
- B. Diabetic control is maximized
- C. Nutritional status is addressed
- D. Amputation is inevitable
- E. Off-loading has been achieved

99. A patient having a seizure should be brought out of the chamber:

- A. Immediately
- B. After the tonic phase is over, the patient is breathing normally and the physician orders the treatment terminated
- C. After the standard course of treatment
- D. At the discretion of the chamber operator

100. Several conditions have data supportive for the use of HBOT but are nonetheless considered investigational by CMS. Which condition is NOT considered investigational?

- A. Acute Myocardial Infarction
- B. Cerebral Palsy
- C. Hypoxic Wounds
- D. Intracranial Abscess
- E. Traumatic Brain Injury

101. To assess for sensory neuropathy, the wound nurse should:

- A. Observe how the patient walks
- B. Conduct a monofilament testing of the plantar surface of the foot
- C. Trace the outline of the patient's foot on a sheet of paper and compare it to the outline of their shoe
- D. Examine the foot for deformities such as hammer or claw toes

102. Which of the following is a NOT relative contraindication to hyperbaric treatment?

- A. Sinusitis
- B. Headache
- C. Fever
- D. High FiO<sub>2</sub>
- E. Cancer

## CHWS PHOTO EXAMINATION

Photo 1



**PQ 1 (Photo 1 – Refer to this Photo to answer the question)**

While working in the Wound Care Center you see this placard on the outside of an examination room. The patient has been placed in the room by the nurse and the door is closed. What should you do next?

- A. Notify security to gain access
- B. Do not enter the room for any reason
- C. Knock on the door before entering
- D. Put on a protective gown and gloves before entering
- E. Wait for housekeeping to clean the room before entering

**Photo 2**



**PQ 2 (Photo 2 – Refer to this Photo to answer the question)**

The patient you are caring for is being debrided by the physician. For the purposes of documentation and billing, what is the MOST appropriate description of the procedure being performed?

- A. Selective Mechanical debridement of necrotic tissue
- B. Non Selective Mechanical debridement of fibrin
- C. Sharp Excisional debridement of necrotic tissue
- D. Sharp Selective debridement of necrotic tissue
- E. Sharp Excisional debridement of fibrin

**Photo 3**



**Photo 4**



**Photo 5**



**Photo 6**



**PQ 3 (Photo 3, 4, 5, 6 – Refer to these Photos to answer the question)**

Please select the photo that is the best example of a Venous Ulcer.

- A. Photo 3
- B. Photo 4
- C. Photo 5
- D. Photo 6

**PQ 4 (Photo 3, 4, 5, 6 – Refer to these Photos to answer the question)**

Please select the photo that is the best example of a Pressure Ulcer.

- A. Photo 3
- B. Photo 4
- C. Photo 5
- D. Photo 6



**PQ 5 (Photo 3, 4, 5, 6 – Refer to these Photos to answer the question)**

Please select the photo that is the best example of a Diabetic Ulcer.

- A. Photo 3
- B. Photo 4
- C. Photo 5
- D. Photo 6

**PQ 6 (Photo 3, 4, 5, 6 – Refer to these Photos to answer the question)**

Please select the photo that is the best example of an Arterial Ulcer.

- A. Photo 3
- B. Photo 4
- C. Photo 5
- D. Photo 6

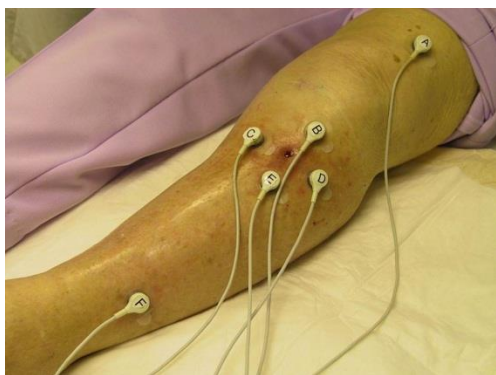
**Photo 7**



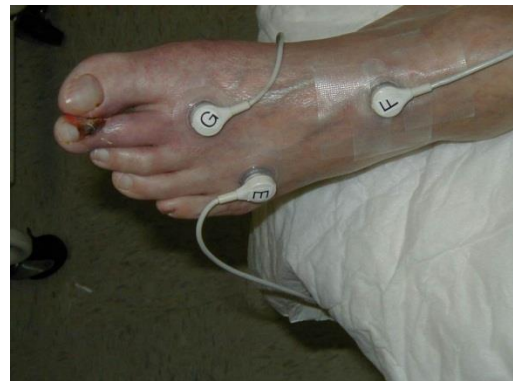
**Photo 8**



**Photo 9**



**Photo 10**



**PQ 7 (Photos 7, 8, 9, 10 – Refer to these Photos to answer the question)**

You are the supervising a new technician who has just completed her Transcutaneous Oxygen Training. Which of the following photos show good technique and placement of the electrodes?

- A. Photo 7
- B. Photo 8
- C. Photo 9
- D. Photo 10

**Photo 11**



**Photo 12**



**Photo 13**



**Photo 14**



**PQ 8 (Photos 11, 12, 13, 14 – Refer to these Photos to answer the question)**

The wound care order reads “Apply Foam Dressing to Wound Base”. You are asked to apply the dressing. Please indicate which one of the above categories of dressings should you use?

- A. Photo 11
- B. Photo 12
- C. Photo 13
- D. Photo 14

**PQ 9 (Photos 11, 12, 13, 14 – Refer to these Photos to answer the question)**

The wound care order reads “Apply Hydrocolloid Dressing to Wound Base”. You are asked to apply the dressing. Please indicate which one of the above categories of dressings should you use?

- A. Photo 11
- B. Photo 12
- C. Photo 13
- D. Photo 14

**PQ 10 (Photos 11, 12, 13, 14 – Refer to these Photos to answer the question)**

The wound care order reads “Apply Alginate Dressing to Wound Base”. You are asked to apply the dressing. Please indicate which one of the above categories of dressings should you use?

- A. Photo 11
- B. Photo 12
- C. Photo 13
- D. Photo 14

**PQ 11 (Photos 11, 12, 13, 14 – Refer to these Photos to answer the question)**

The wound care order reads “Apply Hydrogel to Wound Base”. You are asked to apply the dressing. Please indicate which one of the above categories of dressings should you use?

- A. Photo 11
- B. Photo 12
- C. Photo 13
- D. Photo 14

**Photo 15**



**PQ 12 (Photo 15 – Refer to this Photo to answer the question)**

You are assisting in the evaluation and documentation of wound assessment of this patient. What finding is being illustrated?

- A. Wound Tunneling
- B. Necrotic Tissue
- C. Wound Depth
- D. Wound Undermining
- E. Wound Measurement

**Photo 16**



**PQ 13 (Photo 16 – Refer to this Photo to answer the question)**

A patient presents to the Wound Care Clinic for initial consultation. The above wound has been present for 4 years, but recently has significantly increased in size. This wound would BEST be classified into what group of wound etiologies?

- A. Necrotic
- B. Arterial
- C. Atypical
- D. Diabetic
- E. Pressure

**PQ 14 (Photo 16 – Refer to these Photos to answer the question)**

You are motivated by efficiency and want to “have everything ready for the doctor”. Based on your evaluation and assessment of this patient, what would you anticipate will be needed in the room by the physician after she has evaluated the patient?

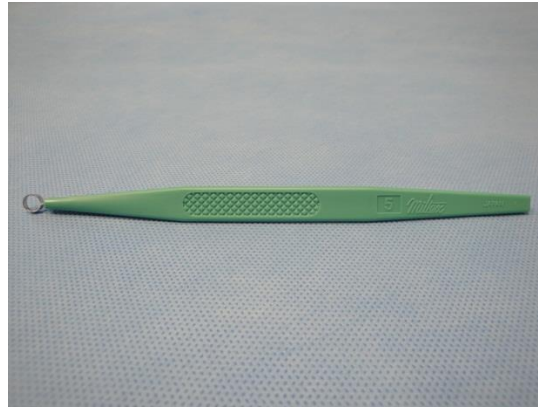
- A. Hyperbaric Oxygen teaching video
- B. Scalpel and surgical tray
- C. Transcutaneous oxygen unit
- D. Biopsy tool and set-up
- E. Admission paperwork



**Photo 17**



**Photo 18**



**Photo 19**



**Photo 20**



**PQ 15 (Photos 15, 16, 17, 18, 19, 20 – Refer to these Photos to answer the question)**

After evaluating the patient illustrated in Photo 15, the physician determines that wound debridement is appropriate. Which of the illustrated instruments is NOT typically used for debridement of necrotic soft tissues?

- A. Photo 17
- B. Photo 18
- C. Photo 19
- D. Photo 20

**PQ 16 (Photo 15 – Refer to this Photo to answer the question)**

Examination of the wound following debridement of the patient illustrated in Photo 15, the physician states that the sacral bone is now palpable. The MOST appropriate diagnosis of this wound would be?

- A. Sacral Pressure Ulcer Deep
- B. Sacral Pressure Ulcer Unstageable
- C. Sacral Pressure Ulcer Stage IV
- D. Sacral Pressure Ulcer Stage III
- E. Sacral Pressure Ulcer Wagner Stage IV

**Photo 21**



**PQ 17 (Photo 21 – Refer to this Photo to answer the question)**

A patient presents to the Wound Care Clinic for a follow up evaluation. After removing the dressing and cleansing the wound, you are asked to describe the appearance of the wound. How would this wound be BEST described?

- A. Necrotic, Fibrin
- B. Necrotic, Granular
- C. Healthy, Marginal
- D. Healthy, Granular
- E. Proliferative, Fibrin

**Photo 22**

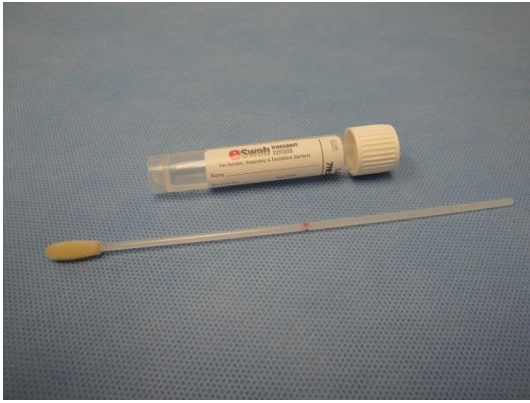


**PQ 18 (Photo 22 – Refer to this Photo to answer the question)**

A patient presents to the Wound Care Clinic for a follow up evaluation. She is being treated with the product illustrated above. Which of the following BEST describes the classification of the wound and the type product being used?

- A. Pressure Ulcer, Moist Gauze
- B. Pressure Ulcer, Dermal Substitute
- C. Diabetic Ulcer, Moist Gauze
- D. Diabetic Ulcer, Dermal Substitute
- E. Diabetic Ulcer, Skin Graft

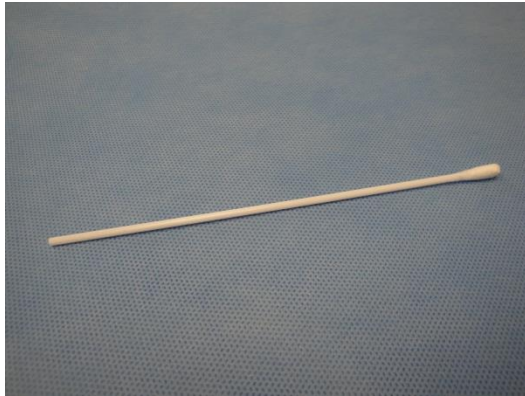
**Photo 23**



**Photo 24**



**Photo 25**



**Photo 26**



**PQ 19 (Photos 23, 24, 25, 26 – Refer to these Photos to answer the question)**

A patient presents to the wound care clinic for initial consultation after being seen in the Emergency Department last night for increasing wound pain and low grade fever. You evaluate the wound and notice erythema and odor. To prepare the room for the physician, you anticipate needing which of the above items?

- A. Photo 23
- B. Photo 24
- C. Photo 25
- D. Photo 26

**Photo 27**



**PQ 20 (Photo 27 – Refer to this Photo to answer the question)**

You are evaluating the patient's wound illustrated above. The BEST terminology to describe the appearance of this wound would be:

- A. Fibrin
- B. Granular
- C. Eschar
- D. Infected
- E. Macerated

**Photo 28**



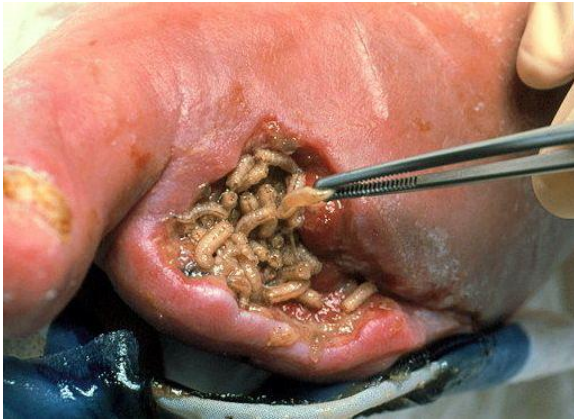
**PQ 21 (Photos 28 – Refer to this Photo to answer the question)**

You are evaluating the patient's wound illustrated above. The BEST terminology to describe the appearance of this wound would be:

- A. Fibrin
- B. Granular
- C. Eschar
- D. Infected
- E. Macerated



**Photo 29**



**Photo 30**



**Photo 31**



**Photo 32**



**PQ 22 (Photos 29, 30, 31, 32 – Refer to these Photos to answer the question)**

The therapy that would most likely be used in the management of a surgical wound is shown in which photo?

- A. Photo 29
- B. Photo 30
- C. Photo 31
- D. Photo 32

**PQ 23 (Photos 29, 30, 31, 32 – Refer to these Photos to answer the question)**

The therapy that would most likely be used in the management of a necrotic wound is shown in which photo?

- A. Photo 29
- B. Photo 30
- C. Photo 31
- D. Photo 32

**PQ 24 (Photos 29, 30, 31, 32 – Refer to these Photos to answer the question)**

The therapy that would most likely be used in the management of a venous ulcer is shown in which photo?

- A. Photo 29
- B. Photo 30
- C. Photo 31
- D. Photo 32

**PQ 25 (Photos 29, 30, 31, 32 – Refer to these Photos to answer the question)**

The therapy that would most likely be used in the management of a superficial diabetic foot ulcer is shown in which photo?

- A. Photo 29
- B. Photo 30
- C. Photo 31
- D. Photo 32