Name:_____ Class:_____ Date:_____

Chapter 02: Medical Gas Therapy Equipment

1. Oxygen therapy is indicated in the acute care setting for adults with:

I. PaO_2 < 60 mmHg

II. SpO_2 < 90%

III. suspected hypoxemia

IV. acute myocardia infarction

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: d

2. Oxygen therapy is indicated in the sub-acute or home setting for adults with:

I. PaO_2 < 55 mmHg

II. SpO_2 < 88%

III. hypoxemia in association with cor pulmonale

IV. pulmonary hypertension

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: d

3. A high-flow oxygen delivery device:

a. is operated at flows greater than 10 L/min

b. provides part of a patient's inspiratory needs

c. operates from 100% oxygen only

d. provides all of a patient's inspiratory needs

ANSWER: d

4. A low-flow oxygen delivery device:

a. is operated at flows greater than 10 L/min

b. provides part of a patient's inspiratory needs

c. operates from 100% oxygen only

d. provides all of a patient's inspiratory needs

ANSWER: b

5. Most high-flow oxygen systems work using:

a. the venturi principle b. Bernoulli's principle

c. viscous shearing and vorticity d. none of the above

ANSWER: c

6. Low-flow oxygen delivery devices:

I. vary in the concentration that they deliver

II. deliver concentrations that are influenced by the patient's respiratory rate

III. deliver concentrations that are influenced by the patient's respiratory pattern

IV. deliver concentrations that are influenced by the patient's tidal volume

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: d

7. HAFOE (high air flow with oxygen enrichment) masks operate using:

a. the venturi principle b. Bernoulli's principle

c. viscous shearing and vorticity d. none of the above

ANSWER: c

8. At 40%, a HAFOE (high air flow with oxygen enrichment) mask is operating with an air-to-oxygen entrainment ratio of:

a. 1:1 b. 2:1

c. 3:1 d. 4:1

ANSWER: c

9. A HAFOE (high air flow with oxygen enrichment) mask is set at 40%, and the oxygen flowmeter is running at 6 L/min. What is the total flow to the patient?

a. 6 L/min b. 18 L/min

c. 24 L/min d. 30 L/min

ANSWER: c

10. A HAFOE (high air flow with oxygen enrichment) mask is operating at 50%, and the oxygen flowmeter is set at 15 L/min. What is the total flow to the patient?

a. 16 L/min b. 31 L/min

c. 41 L/min d. 51 L/min

ANSWER: c

11. A HAFOE (high air flow with oxygen enrichment) mask is set at 50%. What is the air-to-oxygen entrainment ratio?

a. 1:1 b. 1.7:1

c. 3:1 d. 4:1

ANSWER: b

12. A high-flow oxygen delivery device is set at 35%, and the oxygen flowmeter is set at 5 L/min. What is the total flow to the patient?

a. 15 L/min b. 20 L/min

c. 30 L/min d. 35 L/min

ANSWER: c

13. A HAFOE (high air flow with oxygen enrichment) is set at 35%. What is the air-to-oxygen entrainment ratio?

a. 2:1 b. 3:1

c. 4:1 d. 5:1

ANSWER: d

14. A HAFOE (high air flow with oxygen enrichment) mask is set at 24%, and the oxygen flowmeter is running at 3 L/min. What is the total flow to the patient?

a. 74 L/min b. 84 L/min

c. 94 L/min d. 104 L/min

ANSWER: d

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15. A HAFOE (high air flow with oxygen enrichment) is set at 24%. What is the air-to-oxygen entrainment ratio?

a. 5:1 b. 8:1

c. 10:1 d. 25:1

ANSWER: d

16. Oxygen delivery through a HAFOE (high air flow with oxygen enrichment) mask:

a. is affected by the patient's tidal volume

b. is affected by the patient's respiratory rate

c. is affected by the patient's breathing pattern

d. none of the above

ANSWER: d

17. Which of the following are high-flow delivery devices?
I. disposable non-rebreathing mask
II. high air flow with oxygen enrichment (HAFOE) mask
III. anesthesia bag-mask systems
IV. partial rebreathing mask

a. I and II b. I and III

c. II and III d. III and IV

ANSWER: c

18. A low-flow oxygen delivery device:
I. meets all of the patient's inspiratory needs
II. meets part of the patient's inspiratory needs
III. entrains room air
IV. delivers 100% oxygen

a. I and III b. I and IV

c. II and III d. II and IV

ANSWER: c

19. At 3 L/min, a nasal cannula delivers approximately what F_IO_2?

a. 24% b. 28%

c. 32% d. 36%

ANSWER: b

20. A nasal cannula running at 2 L/min delivers approximately what F_IO_2?

a. 24% b. 28%

c. 32% d. 36%

ANSWER: a

21. A nasal cannula running at 6 L/min delivers approximately what F_IO_2?

a. 28% b. 32%

c. 36% d. 40%

ANSWER: d

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22. A pendant cannula is advantageous over a simple nasal cannula because:

a. it delivers a higher F_IO_2

b. it has a more consistent oxygen delivery

c. it is not affected by the patient's respiratory rate or tidal volume

d. it can conserve oxygen

ANSWER: d

23. A transtracheal catheter has advantages compared with a nasal cannula because:

a. it delivers a higher F_IO_2

b. it has a more consistent oxygen delivery

c. it is not affected by the patient's respiratory rate or tidal volume

d. it can conserve oxygen

ANSWER: d

24. Hazards of a transtracheal catheter include:
I. infection
II. subcutaneous emphysema
III. hemoptysis
IV. mucosal drying

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: c

25. A simple oxygen mask can deliver approximately what range of F_IO_2?

a. 25-45% b. 35-55%

c. up to 60% d. up to 70%

ANSWER: b

26. A partial rebreathing oxygen mask can deliver approximately what range of F_IO_2?

a. 25-45% b. 35-55%

c. up to 60% d. up to 70%

ANSWER: c

27. A disposable non-rebreathing oxygen mask can deliver approximately what range of F_IO_2?

a. 25-45% b. 35-55%

c. up to 60% d. up to 80%

ANSWER: d

28. Which of the following are low-flow oxygen delivery devices?
I. non-rebreathing mask
II. partial rebreathing mask
III. simple oxygen mask
IV. high air flow with oxygen enrichment (HAFOE) mask

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: c

29. Which of the following are advantages of high flow heated humidified oxygen therapy via a nasal cannula?

I. Reduced oxygen dilution
II. Decreased deadspace
III. Generation of continuous positive airway pressure
IV. Increased patient comfort

a. I b. I and II
c. I, II, and III d. I, II, III, and IV

ANSWER: d

30. What is flow rate range for the Teleflex Medical Comfort Flo heated humidified nasal cannula?

a. 1 - 30 L/min b. 1 - 40 L/min
c. 5 - 50 L/min d. 5 - 60 L/min

ANSWER: b

31. What liter flow of heated humidified oxygen can the Vapotherm Precision Flow™ deliver through its cannula?

a. 6 L/min b. 10 L/min
c. 20 L/min d. 40 L/min

ANSWER: d

32. What percentage relative humidity at 41 degrees Celsius can the Vapotherm Precision Flow™ deliver?

a. 65% b. 75%
c. 85% d. 95%

ANSWER: d

33. Incubators (Isolettes) are frequently used for:

a. oxygen therapy b. humidity therapy
c. thermal regulation d. none of the above

ANSWER: c

34. A head box is classified as:

a. a high-flow delivery device b. a low-flow delivery device
c. an enclosure d. none of the above

ANSWER: c

35. Oxygen is typically delivered to a head box using:

a. a high air flow with oxygen entrainment (HAFOE) device
b. two flowmeters (one for air and one for oxygen)
c. a blender
d. none of the above

ANSWER: c

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36. When using mist tents or croupettes, you must be careful because:
    a. oxygen concentrations are high
    b. flow into the tent is high, causing heat retention
    c. oxygen concentrations can layer
    d. the volume of the enclosure is very small

ANSWER: c

37. Hyperbaric oxygen therapy is the application of oxygen at:
    a. ambient pressure b. sub-ambient pressure
    c. greater than ambient pressure d. none of the above

ANSWER: c

38. Hyperbaric oxygen therapy:
    a. increases the PaO_2
    b. increases oxygen saturation (SaO_2)
    c. decreases elimination of carbon monoxide
    d. increases the size of dissolved gas bubbles

ANSWER: a

39. Hyperbaric oxygen therapy is approved for the treatment of:
I. gas gangrene
II. radiation necrosis
III. carbon monoxide poisoning
IV. necrotizing soft tissue infections
    a. I b. I and II
    c. I, II, and III d. I, II, III, and IV

ANSWER: d

40. The only absolute contraindication for hyperbaric therapy is:
    a. subcutaneous emphysema b. upper respiratory infections
    c. bullous emphysema d. untreated pneumothorax

ANSWER: d

41. When setting the flowmeter on a partial rebreathing mask, oxygen flow
    a. should be at least 10 L/min
    b. should be set at flush (maximum setting)
    c. should be adjusted to maintain the desired $PaCO_2$
    d. should be adjusted to keep the bag full

ANSWER: d

42. Helium/oxygen (heliox) mixtures are advantageous in treating obstructive lung disease (refractory asthma) because:
    a. the gas viscosity is lower
    b. higher oxygen concentrations are possible
    c. helium doesn't dissolve into the plasma

d. the density of the gas is lower

ANSWER: d

43. When adjusting the flow during helium/oxygen (heliox) therapy, gas flow:

a. should be at least 10 L/min

b. should be set at flush (maximum setting)

c. should be adjusted to maintain the desired $PaCO_2$

d. should be adjusted to keep the bag full

ANSWER: d

44. A helium/oxygen (heliox) mixture of 80%/20% has a density compared with oxygen of:

a. 1.8 times greater b. 1.6 times greater

c. 1.8 times lower d. 1.6 times lower

ANSWER: c

45. A helium/oxygen (heliox) mixture of 70%/30 % has a density compared with oxygen of:

a. 1.8 times greater b. 1.6 times greater

c. 1.8 times lower d. 1.6 times lower

ANSWER: d

46. The physician wants a liter flow of 12 L/min of a 20%/80% helium/oxygen mixture. The only flowmeter you have is an oxygen flowmeter. What should you adjust the flowmeter to read?

a. 22 L/min b. 19 L/min

c. 7 L/min d. 8 L/min

ANSWER: c

47. The physician wants a liter flow of 12 L/min of a 30%/70% helium/oxygen mixture. The only flowmeter you have is an oxygen flowmeter. What should you adjust the flowmeter to read?

a. 22 L/min b. 19 L/min

c. 7 L/min d. 8 L/min

ANSWER: d

48. Helium/oxygen (heliox) therapy should be delivered using:

a. a nasal cannula b. a simple oxygen mask

c. a partial rebreathing mask d. a tight non-rebreathing mask

ANSWER: d

49. Which of the following is a common mixture for carbon dioxide/oxygen therapy?

a. 5%/95% b. 20%/80%

c. 30%/70% d. none of the above

ANSWER: a

50. Which of the following is a common mixture for helium/oxygen therapy?

a. 7%/93% b. 20%/80%

c. 5%/95% d. none of the above

ANSWER: b

51. Which of the following are hazards of carbon dioxide/oxygen therapy?
I. increased blood pressure
II. increased heart rate
III. increased respiratory rate
IV. increased depth of breathing

a. I b. I and II

c. I, II, and III d. I, II, III, and IV

ANSWER: d

52. Carbon dioxide/oxygen therapy should be limited to:

a. 1 to 5 minutes b. 5 to 15 minutes

c. 15 to 20 minutes d. 20 to 60 minutes

ANSWER: b

53. Nitric oxide (NO) therapy is approved for treatment of:

a. pulmonary embolus b. pulmonary edema

c. pulmonary hypertension d. pulmonary infarction

ANSWER: c

54. The therapeutic range for inhaled nitric oxide is:

a. 10 to 20% b. 2 to 80%

c. 2 to 80 parts per million d. less than 1 part per million

ANSWER: c

55. Inhaled nitric oxide is delivered via

a. nasal cannula b. transtracheal catheter

c. non-rebreathing mask d. the I-NO vent

ANSWER: d

56. Nitric oxygen may combine with water to form
I. nitrous oxide
II. nitrogen dioxide
III. nitric acid
IV. nitrate

a. I and II b. II and III

c. I and III d. II and IV

ANSWER: b

57. How is oxygen percentage regulated in a heated humidified high flow nasal cannula?

a. It is factor preset.

b. It is adjusted using air dilution (HAFOE).

c. It is adjusted by setting two flowmeters; one for air and the other for oxygen.

d. There are proportional solenoid valves that adjust the oxygen percentage.

ANSWER: d