Ventilator Types and Mechanisms

1. A ventilator is a machine that supports or replaces _____ function in patients who cannot breathe adequately.
   a) Cardiac
   b) Liver
   c) Respiratory
   d) Renal
   Answer: c) Respiratory

2. The primary function of a ventilator is to ensure adequate _____ exchange.
   a) Blood
   b) Oxygen and carbon dioxide
   c) Food
   d) Hormone
   Answer: b) Oxygen and carbon dioxide

3. **Intermittent Positive Pressure Ventilation (IPPV)** provides air to the lungs by applying _____ pressure during inhalation.
   a) Negative
   b) Positive
   c) Neutral
   d) Equal
   Answer: b) Positive

4. **Intermittent Positive Pressure Breathing (IPPB)** units are mainly used for patients with difficulty in _____.
   a) Eating
   b) Walking
   c) Breathing
   d) Sleeping
   Answer: c) Breathing

5. **Negative pressure ventilators** work by creating a vacuum around the chest, simulating normal _____.
   a) Passive expiration
   b) Active expiration
   c) Passive inspiration
   d) Active inspiration
   Answer: c) Passive inspiration

6. **Positive pressure ventilators** push air into the lungs, whereas **negative pressure ventilators** work by _____ the chest cavity.
   a) Expanding
   b) Compressing
   c) Squeezing
   d) Deflating
   Answer: a) Expanding

7. A ventilator that delivers a set volume of air during each breath is called a _____ ventilator.
   a) Volume-cycled
   b) Pressure-cycled
   c) Time-cycled

d) Flow-cycled
Answer: a) Volume-cycled

8. A ventilator mode that allows spontaneous breathing by the patient while providing necessary support is called _____.
   a) Controlled Ventilation
   b) Assisted Ventilation
   c) Intermittent Ventilation
   d) BiPAP
   Answer: b) Assisted Ventilation

Breathing Apparatus and Operating Sequence

9. The breathing cycle consists of two main phases: _____ and _____.
   a) Inspiration, Expiration
   b) Inhalation, Filtration
   c) Compression, Relaxation
   d) Intake, Absorption
   Answer: a) Inspiration, Expiration

10. The normal respiratory rate in an adult at rest is about _____ breaths per minute.
    a) 6-10
    b) 12-20
    c) 24-30
    d) 30-40
    Answer: b) 12-20

11. The oxygen concentration delivered by a ventilator is measured in terms of _____.
    a) VO_2 max
    b) PEEP
    c) FiO_2
    d) Tidal Volume
    Answer: c) FiO_2

12. A ventilator must monitor and regulate tidal volume, respiratory rate, and _____ pressure.
    a) Blood
    b) Airway
    c) Cardiac
    d) Intravenous
    Answer: b) Airway

13. **PEEP (Positive End-Expiratory Pressure)** is used to prevent _____ of alveoli at the end of expiration.
    a) Overexpansion
    b) Collapsing
    c) Blood clotting
    d) Oxygen accumulation
    Answer: b) Collapsing

14. A **humidifier** is often used in a ventilator circuit to prevent _____ of the airway.
    a) Drying
    b) Swelling

c) Infection
d) Spasms
Answer: a) Drying

15. The fraction of oxygen in inhaled air (FiO_2) is typically set between _____ in ventilated patients.
    a) 0.21 to 1.0
    b) 1.2 to 2.5
    c) 0.1 to 0.5
    d) 2.0 to 3.0
    Answer: a) 0.21 to 1.0

Electronic IPPB Unit and Monitoring Parameters

16. **Electronic IPPB units** provide controlled breaths and monitor respiratory parameters such as tidal volume and _____.
    a) Oxygen demand
    b) Blood circulation
    c) Hemoglobin level
    d) Pressure settings
    Answer: d) Pressure settings

17. **Inspiratory pressure** in an IPPB unit helps in determining the volume of air delivered per _____.
    a) Minute
    b) Breath
    c) Hour
    d) Cycle
    Answer: b) Breath

18. An important feature of an electronic IPPB unit is the ability to adjust _____ sensitivity to match patient effort.
    a) Humidity
    b) Flow
    c) Pressure
    d) Temperature
    Answer: c) Pressure

19. An alarm in a ventilator system alerts caregivers when parameters such as tidal volume, pressure, or _____ deviate from normal.
    a) Oxygen supply
    b) Blood flow
    c) Respiratory rate
    d) Heart rate
    Answer: c) Respiratory rate

20. The sensitivity setting of an IPPB machine helps detect the patient's attempt to _____.
    a) Sleep
    b) Exhale
    c) Inhale
    d) Hold breath
    Answer: c) Inhale

21. A critical advantage of electronic ventilators over mechanical ventilators is real-time _____.
    a) Humidity control
    b) Data monitoring
    c) Oxygen absorption
    d) Blood pressure regulation
    Answer: b) Data monitoring

22. An advanced ventilator mode that automatically adjusts breath support based on patient effort is called _____.
    a) Volume-Controlled Ventilation
    b) Pressure-Controlled Ventilation
    c) Adaptive Support Ventilation
    d) Time-Cycled Ventilation
    Answer: c) Adaptive Support Ventilation

23. In emergency conditions, a transport ventilator is used for patients requiring mechanical ventilation during _____.
    a) Dialysis
    b) Surgery
    c) Movement between locations
    d) MRI scan
    Answer: c) Movement between locations

24. **Non-invasive ventilation (NIV)** is preferred over invasive methods to reduce the risk of _____.
    a) Anemia
    b) Lung infection
    c) Hypoxia
    d) Pneumothorax
    Answer: b) Lung infection

25. A BiPAP machine differs from CPAP because it provides two levels of _____.
    a) Temperature
    b) Oxygen supply
    c) Air pressure
    d) Tidal volume
    Answer: c) Air pressure

26. A **high-pressure alarm** on a ventilator is triggered when there is an obstruction in the _____.
    a) Blood vessel
    b) Airway
    c) Oxygen tank
    d) Dialysate
    Answer: b) Airway

27. The most common cause of a **low-pressure alarm** on a ventilator is a _____.
    a) Blocked endotracheal tube
    b) Disconnected circuit
    c) Excessive airway pressure
    d) Oxygen toxicity
    Answer: b) Disconnected circuit

28. A **high tidal volume alarm** may indicate that the ventilator is delivering _____ air than required.
    a) More

b) Less
c) No
d) Cold
Answer: a) More

29. A **low exhaled volume alarm** on a ventilator may indicate a _____.
    a) Leak in the system
    b) Normal breath cycle
    c) Decreased heart rate
    d) Oxygen deficiency
    Answer: a) Leak in the system

30. If a patient on a ventilator is experiencing hypoxia, the first step is to check the _____ supply.
    a) Food
    b) Oxygen
    c) Blood
    d) Dialysate
    Answer: b) Oxygen

31. A **PEEP malfunction** in a ventilator can lead to **alveolar collapse**, causing decreased _____.
    a) Blood pressure
    b) Oxygenation
    c) Carbon dioxide levels
    d) Heart rate
    Answer: b) Oxygenation

32. The most common sign of **endotracheal tube displacement** in a ventilated patient is sudden _____.
    a) Increase in blood pressure
    b) Decrease in oxygen saturation
    c) Decrease in heart rate
    d) Increase in urine output
    Answer: b) Decrease in oxygen saturation

33. **Auto-PEEP** occurs when the patient is unable to fully _____ before the next breath.
    a) Inhale
    b) Exhale
    c) Cough
    d) Sleep
    Answer: b) Exhale

34. A sudden increase in **airway resistance** can be caused by a buildup of _____ in the endotracheal tube.
    a) Blood
    b) Mucus
    c) Water vapor
    d) Carbon dioxide
    Answer: b) Mucus

35. **Apnea alarms** are used in ventilators to detect the absence of _____.
    a) Heart rate
    b) Blood flow
    c) Breathing

d) Oxygen supply
Answer: c) Breathing

36. Ventilators are commonly used in patients with **Acute Respiratory Distress Syndrome (ARDS)** to prevent _____.
    a) Kidney failure
    b) Organ transplantation
    c) Lung collapse
    d) Dialysis
    Answer: c) Lung collapse

37. The primary goal of mechanical ventilation is to maintain adequate _____ exchange.
    a) Heat
    b) Oxygen and carbon dioxide
    c) Electrolyte
    d) Nutrient
    Answer: b) Oxygen and carbon dioxide

38. **Invasive mechanical ventilation** requires the use of an endotracheal or _____ tube.
    a) Nasogastric
    b) Tracheostomy
    c) Peripheral
    d) Catheter
    Answer: b) Tracheostomy

39. A ventilator mode that allows the patient to breathe spontaneously while providing support is known as _____.
    a) Assist-Control Mode
    b) Spontaneous Ventilation
    c) Pressure-Control Mode
    d) Synchronized Intermittent Mandatory Ventilation (SIMV)
    Answer: d) Synchronized Intermittent Mandatory Ventilation (SIMV)

40. In emergency situations, ventilators are essential for maintaining airway patency in patients with _____.
    a) Liver disease
    b) Heart failure
    c) Respiratory failure
    d) Kidney stones
    Answer: c) Respiratory failure

41. **Non-invasive ventilation (NIV)**, such as CPAP and BiPAP, is used primarily in patients with _____.
    a) Sleep apnea
    b) Kidney failure
    c) Liver cirrhosis
    d) Cardiac arrest
    Answer: a) Sleep apnea

42. A **pressure-controlled ventilator** is commonly used for patients with stiff lungs, such as those with _____.
    a) Pulmonary fibrosis
    b) Asthma
    c) Diabetes

d) Anemia
Answer: a) Pulmonary fibrosis

43. **Tidal volume** in a ventilator is adjusted based on the patient's _____ size and lung capacity.
    a) Age
    b) Body weight
    c) Blood group
    d) Oxygen level
    Answer: b) Body weight

44. The primary benefit of a **high-frequency ventilator** is its ability to deliver very small tidal volumes at a _____ rate.
    a) Slow
    b) High
    c) Irregular
    d) Fixed
    Answer: b) High

45. **Prone positioning** in ventilated patients improves oxygenation by redistributing _____.
    a) Carbon dioxide
    b) Lung perfusion
    c) Tidal volume
    d) Blood sugar
    Answer: b) Lung perfusion

46. A **high-pressure alarm** on a ventilator is usually triggered by _____.
    a) Disconnected tubing
    b) Airway obstruction
    c) Low tidal volume
    d) Leaks in the system
    Answer: b) Airway obstruction

47. A **low-pressure alarm** on a ventilator can indicate a _____ in the breathing circuit.
    a) Blockage
    b) Leak
    c) Blood clot
    d) Decreased oxygen demand
    Answer: b) Leak

48. If a ventilator's **apnea alarm** is activated, it means the patient has _____.
    a) Increased heart rate
    b) Stopped breathing
    c) High oxygen saturation
    d) Reduced airway resistance
    Answer: b) Stopped breathing

49. A **low exhaled tidal volume alarm** suggests that the patient is receiving _____ air than expected.
    a) More
    b) Less
    c) The same amount of
    d) Increased oxygen
    Answer: b) Less

50. A **high respiratory rate alarm** may indicate that the patient is experiencing _____.
    a) Hypoventilation
    b) Hyperventilation
    c) Stable breathing
    d) Decreased CO_2 levels
    Answer: b) Hyperventilation

51. A patient on a ventilator suddenly develops low oxygen saturation. The first step in troubleshooting should be to check the _____.
    a) Oxygen flow
    b) Heart rate
    c) Patient's glucose level
    d) Room temperature
    Answer: a) Oxygen flow

52. If a ventilator's **power failure alarm** is activated, the healthcare provider should immediately switch to a _____.
    a) Manual resuscitator (Ambu bag)
    b) CPAP machine
    c) High-flow nasal cannula
    d) Oxygen concentrator
    Answer: a) Manual resuscitator (Ambu bag)

53. A high **peak inspiratory pressure (PIP)** alarm may indicate increased airway resistance due to _____.
    a) Fluid retention
    b) Bronchospasm
    c) Decreased lung compliance
    d) Increased blood circulation
    Answer: b) Bronchospasm

54. A **circuit disconnection** is most likely to trigger a _____ alarm on a ventilator.
    a) High-pressure
    b) Low-pressure
    c) Apnea
    d) Battery failure
    Answer: b) Low-pressure

55. If a ventilator's **oxygen alarm** is triggered, it means the FiO_2 level is outside the _____ range.
    a) 0.1 - 0.2
    b) 0.21 - 1.0
    c) 1.5 - 2.0
    d) 2.0 - 3.0
    Answer: b) 0.21 - 1.0

56. **Mechanical ventilation** is commonly required in patients with severe _____ failure.
    a) Kidney
    b) Liver
    c) Respiratory
    d) Cardiac
    Answer: c) Respiratory

57. **Non-invasive ventilation (NIV)**, such as CPAP or BiPAP, is preferred in patients with _____.
    a) Acute respiratory distress syndrome (ARDS)
    b) Sleep apnea
    c) Cardiac arrest
    d) Brain stroke
    Answer: b) Sleep apnea

58. Ventilators play a crucial role in managing patients with **Acute Respiratory Distress Syndrome (ARDS)** by maintaining adequate _____.
    a) Blood pressure
    b) Oxygenation
    c) Digestion
    d) Muscle tone
    Answer: b) Oxygenation

59. **Pressure-controlled ventilation (PCV)** is used in cases where maintaining airway _____ is crucial.
    a) Resistance
    b) Pressure
    c) Flow
    d) Temperature
    Answer: b) Pressure

60. **Volume-controlled ventilation (VCV)** is preferred when the goal is to ensure a fixed _____ per breath.
    a) Tidal volume
    b) Pressure
    c) CO_2 level
    d) Lung expansion
    Answer: a) Tidal volume

61. **High-frequency ventilation (HFV)** is used primarily in patients with _____ lungs.
    a) Normal
    b) Collapsed
    c) Stiff or damaged
    d) Inflated
    Answer: c) Stiff or damaged

62. The main advantage of **Adaptive Support Ventilation (ASV)** is that it automatically adjusts based on the patient's _____.
    a) CO_2 levels
    b) Breathing effort
    c) Tidal volume
    d) Heart rate
    Answer: b) Breathing effort

63. **Weaning** from a ventilator involves gradually reducing ventilatory support to allow the patient to resume _____ breathing.
    a) Artificial
    b) Spontaneous
    c) Assisted
    d) Controlled
    Answer: b) Spontaneous

64. **Intubation and mechanical ventilation** are most commonly required in patients undergoing major _____ surgeries.
    a) Orthopedic
    b) Cardiac
    c) Skin graft
    d) Dental
    Answer: b) Cardiac

65. **Tracheostomy ventilation** is preferred for patients requiring long-term mechanical ventilation due to _____.
    a) Minor infections
    b) Chronic respiratory failure
    c) Diabetes
    d) Temporary lung collapse
    Answer: b) Chronic respiratory failure

66. **Synchronized Intermittent Mandatory Ventilation (SIMV)** allows the patient to breathe _____ between mandatory ventilator breaths.
    a) Normally
    b) Spontaneously
    c) With difficulty
    d) Under pressure
    Answer: b) Spontaneously

67. **Pressure Support Ventilation (PSV)** is commonly used to assist patients during _____ from mechanical ventilation.
    a) Weaning
    b) Surgery
    c) Intubation
    d) Oxygen therapy
    Answer: a) Weaning

68. **High-flow nasal cannula (HFNC)** therapy provides heated, humidified oxygen and is an alternative to _____.
    a) Invasive ventilation
    b) Intravenous therapy
    c) Blood transfusion
    d) Chemotherapy
    Answer: a) Invasive ventilation

69. **Proportional Assist Ventilation (PAV)** automatically adjusts support based on the patient's _____ demand.
    a) Oxygen
    b) Ventilatory
    c) Nutritional
    d) Hydration
    Answer: b) Ventilatory

70. **Closed-loop ventilation** systems use real-time monitoring and _____ to optimize respiratory support.
    a) AI-based algorithms
    b) Manual settings
    c) Physician intervention

d) Blood transfusions
Answer: a) AI-based algorithms

Advanced Ventilator Technologies and Future Trends

21. The latest ventilator models incorporate **closed-loop systems** that automatically adjust settings based on real-time _____.
    a) Blood glucose
    b) Oxygen demand
    c) Blood flow
    d) Nutrient levels
    Answer: b) Oxygen demand

22. **Adaptive Support Ventilation (ASV)** automatically adjusts _____ to optimize patient comfort.
    a) Humidity
    b) Tidal volume
    c) Blood pressure
    d) FiO_2
    Answer: b) Tidal volume

23. A **wearable portable ventilator** is designed for patients with chronic respiratory failure, such as those with _____.
    a) Hypertension
    b) COPD
    c) Diabetes
    d) Arthritis
    Answer: b) COPD

24. **Smart ventilators** use artificial intelligence to predict and prevent respiratory _____.
    a) Failure
    b) Infection
    c) Inflammation
    d) Paralysis
    Answer: a) Failure

25. The integration of **telemedicine** with ventilators allows remote monitoring of _____ patients.
    a) Intubated
    b) Dialysis
    c) Non-ventilated
    d) Cardiac arrest
    Answer: a) Intubated