NBRC CRT - Quiz Questions with Answers

1. Patient Data

1.

A patient who you are evaluating tells you, "I have been coughing up green, foul-smelling mucus." Which of the following does this likely indicate?

- **The patient has a *Pseudomonas* infection**
- The patient is expectorating old, retained secretions
- The patient is expectorating normal mucus
- The patient's sputum contains white blood cells

Correct answer: The patient has a Pseudomonas infection

Green, foul-smelling sputum is normally indicative of a Pseudomonas infection.

Green sputum without an odor may indicate old, retained secretions. Normal mucus is white and translucent. Sputum containing white blood cells will be yellow or tan and is also called purulent sputum.

2.

Which of the following is NOT a goal when treating obstructive sleep apnea?

Monitor changes in sleeping patterns

Eliminate apnea, hypopnea, and snoring

Normalize O2 saturation and ventilation

Improve sleep architecture and continuity

Correct answer: Monitor changes in sleeping patterns

Monitoring the patient's sleeping patterns and responses to therapy is an essential part of treatment, but a component of treatment is not the same as a goal of treatment.

Eliminating apnea, hypopnea, and snoring; normalizing O2 saturation and ventilation; and improving sleep architecture and continuity are all goals of treating OSA.

3.

The respiratory therapist is called to the Emergency Department for a 42-year-old male who has a known heroin-use disorder. The patient is in respiratory arrest and "just passed out" according to a friend who was present when he arrested. The friend states that the patient had not used heroin in the last 24 hours.

Which of the following medications is MOST important for the respiratory therapist to recommend?

Naloxone hydrochloride

Epinephrine

Atropine

Lidocaine

Correct answer: Naloxone hydrochloride

The patient may be experiencing an opioid overdose, and naloxone hydrochloride can reverse the effects of an opioid overdose.

Even though the patient's friend states he has not used heroin, it is unknown if the friend is a reliable historian, and it is safe to administer naloxone hydrochloride even if the patient is not overdosing. Epinephrine, atropine, and lidocaine are used to treat cardiac arrest, not respiratory arrest.

4.

A patient on a 40% air-entrainment mask has the following ABG levels:

pH 7.41

PaCO2 40 torr

PaO2 102 torr

What is this patient's P(A-a)O2? (PB = 747mm Hg)

128 mm Hg

230 mm Hg

102 mm Hg

13 mm Hg

Correct answer: 128 mm Hg

*The exam generally uses a barometric pressure of 747mm Hg, giving a corrected PB of 700mm Hg. The equation for determining PAO2 is: PAO2 = (700xO2%) - (PaCO2*1.25).*

*For the parameters given here, the result is PAO2 = (700x0.4) - (40*1.25) = 280 - 50 = 230.*

P(A-a)O2 is calculated by using the equation: P(A-a)O2 = PAO2 - PaO2.

The result for this question is: P(A-a)O2 = 230 - 102 = 128 mm Hg.

5.

What is the correct term for apnea that initially is caused by an airway obstruction but develops into the patient failing to initiate respiratory effort?

Mixed apnea

Obstructive apnea

Central apnea

Sleep apnea

Correct answer: Mixed apnea

Mixed apnea is a combination of obstructive and central apnea.

Obstructive apnea is caused when effort to breathe occurs but the airway is obstructed, preventing airflow. Central apnea is apnea that occurs when there is no effort to breathe. Sleep apnea can be either obstructive or central, but it is not the apnea described in the question stem.

6.

Which of the following respiratory conditions would a sweat chloride test be used to diagnose?

Cystic fibrosis

Pulmonary fibrosis

Tuberculosis

Pneumonia

Correct answer: Cystic fibrosis

A sweat chloride test tests the chloride content of sweat. Cystic fibrosis is characterized by a genetic defect in cellular chloride channels which prevents normal reabsorption and conservation of chloride levels. An elevated level of chloride in sweat indicates that cystic fibrosis is likely present.

Pulmonary fibrosis is very different from cystic fibrosis and is caused by scarring of the lung tissues. Both tuberculosis and pneumonia can cause sweating as a symptom, but the chloride content of sweat is not affected, and a chloride sweat test is not used for these conditions.

7.

When drawing a capillary blood gas specimen, which of the following interventions is INCORRECT?

Squeezing a sample from the capillaries once the first drop of blood has been wiped away

Warming the site to 42° C

Confirming steady state conditions

Either chilling the sample after drawing or analyzing it immediately

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Correct answer: Squeezing a sample from the capillaries once the first drop of blood has been wiped away

A sample should be acquired after the first drop of blood has been wiped away; however, the site should not be squeezed, as this can contaminate the sample with intracellular or lymphatic fluids.

The site should be warmed to 42° C before accessing and steady-state conditions should be confirmed. The sample should be chilled or analyzed immediately.

8.

The respiratory therapist is helping a doctor determine the prognosis of a patient who has ventilator-associated Pneumonia (VAP). Which of the following factors does NOT lead to increased mortality rates in patients with VAP?

Surgical diagnosis

Renal failure

P. aeruginosa infection

Inappropriate antibiotic therapy

Correct answer: Surgical diagnosis

A non-surgical diagnosis, not a surgical diagnosis, is associated with higher mortality rates in patients with VAP.

Increased mortality rates are associated with certain comorbidities that include renal failure, with certain infectious organisms that include P. aeruginosa, and with inappropriate use of antibiotic therapy.

9.

You are the respiratory therapist treating a patient who has bronchiolitis. Which of the following is MOST likely to cause bronchiolitis?

Respiratory syntactical virus (RSV)

Smoking

Exposure to asbestos

Pneumonia

Correct answer: Respiratory syntactical virus (RSV)

Bronchiolitis is an inflammation of the bronchioles that is most commonly seen in children two years or younger. Bronchiolitis is most commonly caused by an RSV infection, but can be caused by influenza or adenovirus infections.

Bronchitis, not bronchiolitis, is likely to be caused by smoking. Exposure to asbestos is not associated with an increased risk of bronchiolitis. Pneumonia is also not associated with the development of bronchiolitis.

10.

Which of the following causes hyperresonance with percussion?

A greater proportion of air than tissues under the area being percussed

An equal proportion of air and tissues under the area being percussed

A greater proportion of tissues than air under the area being percussed

Only air without tissues under the area being percussed

Correct answer: A greater proportion of air than tissues under the area being percussed

Hyperresonance is caused by a greater proportion of air than tissues under the area that is being percussed.

Equal proportions of air and tissues cause resonance with percussion. A greater proportion of tissues than air causes dullness with percussion. Areas that contain only air without tissues will cause tympany with percussion.

11.

The respiratory therapist is reviewing the chart of a patient with Kussmaul breathing. Which of the following laboratory values is LEAST likely to be abnormal in a patient with this breathing pattern?

Hemoglobin

Glucose

Anion gap

Total carbon dioxide

Correct answer: Hemoglobin

A patient with Kussmaul breathing has metabolic acidosis. This is typically due to diabetic ketoacidosis (DKA). A patient with DKA will normally have high glucose, a low total carbon dioxide level, and an elevated anion gap.

DKA does not typically affect hemoglobin levels.

12.

Which of the following is NOT a criterion when evaluating a patient's Glasgow Coma Score (GCS)?

Best sensory response

Best eye response

Best verbal response

Best motor response

Correct answer: Best sensory response

The GCS uses three criteria to evaluate a patient's level of consciousness. These three areas include best eye response, best verbal response, and best motor response.

Best sensory response is not a criterion used in the GCS, but sensory response is evaluated through both eye and verbal response.

13.

You are the respiratory therapist evaluating a patient who is eating and suddenly begins to choke on a piece of food and is unable to speak or clear their airway. Which of the following interventions should you FIRST perform?

Administer abdominal thrusts

Suction the patient's airway

Intubate the patient

Prepare for a cricothyrotomy

Correct answer: Administer abdominal thrusts

Also called the Heimlich maneuver, abdominal thrusts should be the first intervention administered to a patient who has a foreign body airway obstruction (FBAO).

Suctioning the patient's airway, intubating the patient, and preparing for a cricothyrotomy are all potential interventions, but are not the first intervention that should be considered for a conscious patient that has just begun choking.

14.

Which of the following factors is UNLIKELY to affect dry-powder inhaler drug delivery?

Patient's expiratory flow ability

Patient's inspiratory flow ability

Humid environment

Technique

Correct answer: Patient's expiratory flow ability

Drug delivery when using a Dry Powder Inhaler (DPI) depends on a variety of factors that all impact what percentage of the dose will actually reach the lower airway. The patient's inspiratory flow ability is a major contributing factor, and a peak flow inspiratory rate of at least 60L/min is necessary for most DPIs. The emitted dose of a DPI decreases in a humid environment, likely due to clumping of the powder. Technique is a major factor when utilizing a DPI, and poor technique can significantly impact drug delivery.

Expiratory flow ability does not impact the degree of penetration of the powder during inspiration and is not a significant factor of DPI drug delivery.

15.

Which of the following is NOT a potential complication of chest physical therapy (CPT) that should be considered by the respiratory therapist?

Pneumothorax

Increased intracranial pressure (ICP)

Rib fractures

Decreased cardiac output

Correct answer: Pneumothorax

Complications of CPT can include increased ICP from positioning in the Trendelenburg position or from prolonged coughing. Decreased cardiac output can be caused by positional hypotension and intrathoracic pressure changes. Rib fractures can be caused by overly vigorous percussion, especially in patients who are frail.

Pneumothorax is not likely to be caused by chest percussion except in very rare circumstances and is not a complication that should typically be considered.

16.

The respiratory therapist is providing care for a patient with acute respiratory distress syndrome (ARDS). Which of the following should be avoided for this patient?

Hyperoxia

Hypercapnia

Low V_T

Mechanical ventilation

Correct answer: Hyperoxia

Hyperoxia can be noxious to the lungs and can actually be a trigger of acute respiratory distress syndrome (ARDS). Hyperoxia should be avoided during treatment of ARDS.

Permissive hypercapnia, low tidal volume, and mechanical ventilation are important components of treating ARDS.

17.

Which of the following considerations is MOST important for a patient who has a high prothrombin time (PT)?

Greater care must be taken when performing nasotracheal suctioning

The patient is at a greater risk for developing a pulmonary embolism (PE)

Arterial punctures should never be performed

A high PT does not create any additional considerations for the respiratory therapist

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Correct answer: Greater care must be taken when performing nasotracheal suctioning

A high prothrombin time (PT) indicates that the patient is at a higher risk for bleeding. This means that greater care should be taken with interventions that can cause bleeding, such as performing nasotracheal suctioning or an arterial puncture.

The patient is not at greater risk of developing clotting problems such as a pulmonary embolism; the opposite is actually true. While care should be taken with arterial punctures, and pressure may need to be applied for longer, they are not contraindicated in every situation where a patient has an elevated PT.

18.

The respiratory therapist is evaluating a 23-year-old female who attempted to kill herself by leaving her car running in a poorly ventilated garage but was found before losing consciousness.

Which of the following is NOT an early clinical feature of carbon monoxide poisoning?

Coma

Anxiety

Tachycardia

Headache

Correct answer: Coma

Coma is a clinical feature of carbon monoxide poisoning, but is not an early clinical feature.

Anxiety, tachycardia, and headaches are all considered early clinical features of carbon monoxide poisoning.

19.

You are helping care for a 24-year-old male who has an abnormal respiratory pattern that is caused by diabetic ketoacidosis (DKA). Which of the following breathing patterns would you expect to see?

Rapid, deep breaths at regular intervals

Rapid, shallow breaths at regular intervals

Deep breaths that are irregularly spaced, but still tachypneic

Irregular breathing with varied depth and rate with periods of apnea

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Correct answer: Rapid, deep breaths at regular intervals

Kussmaul breathing is an abnormal breathing pattern that occurs with severe metabolic acidosis as can occur with DKA. Kussmaul breathing attempts to compensate for hypercapnia with deep, rapid breaths.

Rapid, shallow breathing is typically associated with lung inflammation or stiffness. Deep breaths that are irregularly spaced, but still tachypneic, is considered a type of periodic breathing. Irregular breathing with varied depth and rate with periods of apnea describes Cheyne-Stokes respiration.

20.

Which of the following respiratory rates is normal for an unstimulated newborn?

35-45 breaths per minute

35-70 breaths per minute

20-30 breaths per minute

50-70 breaths per minute

Correct answer: 35-45 breaths per minute

A normal respiratory rate for an unstimulated newborn is 35 to 45 breaths per minute. A newborn's respiratory rate may go up to 70 breaths per minute with stimulation. Respiratory rates outside of these ranges are not normal and may require intervention.

21.

Which of the following radiographic findings indicates the presence of laryngotracheobronchitis?

Steeple sign

Thumb sign

Air-bronchograms

Atelectasis

Correct answer: Steeple sign

Steeple sign is caused by a sharply sloped, wedge-shaped narrowing of the trachea and is an indicator of laryngotracheobronchitis (croup).

Thumb sign is caused by a swollen epiglottis and indicates epiglottitis. Air-bronchograms are caused by an alveolar process and are seen in a variety of lung conditions, but are not specific to laryngotracheobronchitis or normally present with laryngotracheobronchitis. Atelectasis is collapsed alveoli and indicates an alveolar process that is not seen with laryngotracheobronchitis.

22.

Which of the following can be adverse consequences of obstructive sleep apnea (OSA)?

1. Nocturnal arrhythmias
2. Stroke
3. Excessive daytime sleepiness
4. Insulin resistance
5. Personality changes

1, 2, 3, 4, & 5

Only 3

1, 3, & 5

3, 4, & 5

Correct answer: 1, 2, 3, 4, & 5

OSA can lead to many potential adverse consequences. These may include nocturnal arrhythmias, stroke, excessive daytime sleepiness, insulin resistance, and adverse personality changes.

23.

The respiratory therapist is caring for a patient who has chronic obstructive pulmonary disease (COPD), but claims that they have never smoked. Which of the following explanations for this claim is NOT likely?

The patient has a history of significant formaldehyde exposure

The patient has an alpha-1 antitrypsin deficiency

The patient has a history of significant second-hand smoke exposure

The patient is not disclosing a smoking history

Correct answer: The patient has a history of significant formaldehyde exposure

Formaldehyde exposure, especially over long periods of time, can lead to asthma or lung cancer, but is not likely to cause COPD.

An alpha-1 antitrypsin deficiency, exposure to second-hand smoke, or a smoking history that is not disclosed can all be potential causes of COPD that could be considered for a patient who claims not to have a smoking history.

24.

Which of the following infants has the GREATEST risk of developing respiratory distress syndrome (RDS)?

An infant born at 31 weeks gestation

An infant with an APGAR score of 2 at one minute after birth

An infant whose amniotic fluid was meconium-stained

An infant with a congenital cardiac malformation

Correct answer: An infant born at 31 weeks gestation

Preterm birth that is prior to 35 weeks gestation is one of the main risk factors for respiratory distress syndrome (RDS).

An infant with RDS may have an APGAR score of 2, but an APGAR score of 2 does not increase the risk of RDS. Meconium-stained amniotic fluid and congenital cardiac malformation may lead to post-birth complications, but do not cause RDS.

25.

Which of the following heart rhythms are considered lethal?

1. Ventricular fibrillation
2. Atrial fibrillation
3. Supraventricular tachycardia
4. Ventricular tachycardia

1 & 4

1, 3, & 4

Only 1

1 & 2

Correct answer: 1 & 4

The rhythms listed here that are considered to be lethal arrhythmias are ventricular fibrillation and ventricular tachycardia. Both of these rhythms can cause inadequate or no contraction of the ventricles, leading to cardiac arrest.

Atrial fibrillation causes no contraction of the atria, which may lead to decreased cardiac output, but this is not typically fatal. Supraventricular tachycardia is tachycardia that originates in the conduction system of the heart prior to the ventricles and may be harmful depending on the circumstances, but is not considered to be a lethal rhythm.

26.

When evaluating the position of the trachea, which of the following is TRUE?

The trachea shifts toward the unaffected side in patients who have massive atelectasis

The trachea shifts away from the unaffected side in patients who have massive atelectasis

The trachea shifts toward the unaffected side in patients who have tension pneumothorax

The trachea never shifts in patients who have massive atelectasis

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Correct answer: The trachea shifts toward the unaffected side in patients who have massive atelectasis

Massive atelectasis can cause deviation of the trachea toward the affected side and away from the unaffected side.

Tension pneumothorax will shift the trachea away from the unaffected side and toward the affected side. The statement that the trachea never shifts in patients who have massive atelectasis is incorrect as tracheal shifts can occur.

27.

Which of the following laboratory findings is MOST likely to make ventilator weaning more difficult?

Hyponatremia

Hypernatremia

Hyperkalemia

Hypocloremia

Correct answer: Hyponatremia

Hyponatremia, or low blood sodium levels, can cause muscle weakness. Hypokalemia, or low blood potassium levels, can also cause muscle weakness. These electrolyte imbalances should be considered before beginning ventilator weaning, as muscle weakness can make weaning more difficult.

Hypernatremia, hyperkalemia, and hypochloremia (low chloride levels) are not likely to negatively impact ventilator weaning.

28.

The respiratory therapist is evaluating a 12-year-old with cystic fibrosis. Which of the following findings is NOT expected for this patient?

Frequent, dry cough

Increased A-P chest diameter

Digital clubbing

Intercostal retractions

Correct answer: Frequent, dry cough

The pathophysiology of cystic fibrosis causes thick mucus to be secreted into the airways, leading to airway obstruction and the promotion of bacterial growth. While a cough is common in patients with cystic fibrosis, the cough typically results in thick mucus production.

An increased A-P chest diameter, digital clubbing, and intercostal retractions are all common findings for patients who have cystic fibrosis.

29.

The respiratory therapist is preparing to collect induced sputum. Which of the following is NOT a good method for sputum induction?

Obtaining a sample when the patient has blunted cough reflexes

Obtaining a sample when the patient has thick secretions

Obtaining a sample when the patient is unable to produce sputum spontaneously

Avoiding the use of bronchoscopy

Correct answer: Obtaining a sample when the patient has blunted cough reflexes

Sputum induction does require that the patient be able to cough, and the respiratory therapist should not attempt to induce sputum in a patient with blunted cough reflexes.

Inducing sputum is indicated for obtaining a sputum sample when the patient has thick secretions as induction thins the secretions and makes them more mobile. Sputum induction is ideal for obtaining a sample when the patient is unable to produce sputum spontaneously and can be used to avoid the use of bronchoscopy.

30.

The respiratory therapist uses the CURB-65 scoring system to evaluate the severity of Community-Acquired Pneumonia (CAP). Which of the following is NOT a criteria of this score?

Respiratory rate > 20 breaths/minute

Confusion

Systolic blood pressure < 90 mm Hg

Urea > 20 mg/dL

Correct answer: Respiratory rate > 20 breaths/minute

The CURB-65 uses five criteria to evaluate the severity of Community-Acquired Pneumonia (CAP). These criteria include:

- *Confusion*
- *Urea > 20 mg/dL*
- *Respiratory rate > 30 breaths/minute*
- *Blood pressure of < 90 mm Hg systolic or < 60 mm Hg diastolic*
- *Age of 65 years or older*

A respiratory rate of > 20 breaths/minute is too low a threshold for the CURB-65 score.

31.

The respiratory therapist performed a blood gas analysis of a preterm infant that was born one hour prior to obtaining the sample. The patient has a PaO2 of 59 mm Hg. Which of the following interventions is necessary for this patient?

No intervention is needed

Start an oxygen hood, delivering 40% O2

Start O2 via nasal cannula at 3 L/min

Intubate the patient and begin mechanical ventilation

Correct answer: No intervention is needed

For a preterm infant, a normal ABG value for the PaO2 can range from 52-68 mm Hg. A value of 59 mm Hg would be normal, given the fact that this patient is preterm and given that delivery was very recent; no additional intervention is necessary.

Providing O2 therapy could actually cause retinopathy of prematurity and should be avoided.

32.

Which of the following is NOT a direct injury that can trigger acute respiratory distress syndrome (ARDS)?

Transfusion-related acute lung injury (TRALI)

Near-drowning

Gastric aspiration

Smoke inhalation

Correct answer: Transfusion-related acute lung injury (TRALI)

While transfusion-related acute lung injury (TRALI) can trigger acute respiratory distress syndrome (ARDS), it is an indirect, not a direct, injury.

Near-drowning, gastric aspiration, and smoke inhalation are all direct lung injuries that can trigger ARDS.

33.

Palpating the patient's thorax while asking them to repeat "ninety-nine" is an example of evaluating for which of the following?

Tactile fremitus

Vocal fremitus

Subcutaneous emphysema

Asymmetrical chest expansion

Correct answer: Tactile fremitus

Tactile fremitus describes vibrations that can be palpated on the chest wall while the patient is vocalizing. Typically, the phrase "ninety-nine" is used to elicit and assess tactile fremitus.

Vocal fremitus refers to vibrations created by the vocal cords during speech. Subcutaneous emphysema is assessed solely by palpating tissues for a crackling sensation and may cause a crackling sound. Asymmetrical chest expansion can be appreciated by visualization and palpation while having the patient take a deep breath.

34.

Which of the following radiographic patterns indicates a viral, not a bacterial, community-acquired pneumonia (CAP)?

Interstitial infiltrates

Pleural effusion

Bronchopneumonia

Lobar consolidation

Correct answer: Interstitial infiltrates

Interstitial infiltrates are a radiographic finding that is consistent with viral pneumonia.

Pleural effusions, bronchopneumonia, and lobar consolidation are all examples of radiographic findings that are indicators of bacterial community-acquired pneumonia (CAP).

35.

Which of the following contraindications of chest physical therapy (CPT) is an absolute contraindication?

Active hemorrhage with hemodynamic instability

Bronchopleural fistula

Empyema

Distended abdomen

Correct answer: Active hemorrhage with hemodynamic instability

Active hemorrhage with hemodynamic instability is an absolute contraindication for CPT in all circumstances.

CPT is generally contraindicated in patients with a bronchopleural fistula or empyema, but the contraindication is relative and there may be times when CPT can still safely be performed. Patients with a distended abdomen can still receive CTP, but the Trendelenburg position is typically contraindicated for these patients.

36.

The respiratory therapist is evaluating a four-year-old female who is suspected to have epiglottitis. Which of the following is the BEST method of diagnosing this condition?

Lateral neck x-ray

Visualization of the epiglottis

Testing for impaired swallowing

Test peak expiratory flow using a peak flow meter

Correct answer: Lateral neck x-ray

A lateral neck x-ray will reveal a swollen epiglottis. This radiographic finding is known as the thumb sign because the epiglottis resembles the distal end of a thumb.

Visualization of the epiglottis should be avoided, as it can exacerbate the patient's condition and lead to complete airway obstruction. Testing for impaired swallowing should be avoided due to the risk of aspiration and exacerbating the inflammation. Testing peak expiratory flow could yield some clinical information, as expiratory flow will be suppressed with narrowing of the upper airway, but this is not the best method of diagnosing epiglottitis.

37.

Which of the following is NOT a risk factor for increased mortality for a patient who has community-acquired pneumonia (CAP)?

Female gender

Temperature < 35º C

Atrial pH < 7.35

Kidney disease

Correct answer: Female gender

Males, not females, are at a higher risk of mortality from community-acquired pneumonia (CAP).

The risk of mortality with CAP does also increase with patient temperatures of less than 35º C or greater than 40º C, with an atrial pH of less than 7.35, or with certain comorbidities including kidney disease.

38.

The respiratory therapist is screening a patient for obstructive sleep apnea (OSA). Which of the following questions is NOT a part of the STOP-BANG questionnaire?

Do you notice that you suddenly wake up in the night?

Do you snore loudly?

Has anyone observed you stop breathing during sleep?

Do you have high blood pressure?

Correct answer: Do you notice that you suddenly wake up in the night?

The STOP-BANG questionnaire consists of eight points that can indicate OSA if a patient scores positive on three or more. These eight points include:

- *Do you **S**nore loudly?*
- *Do you often feel **T**ired, fatigued, or sleepy during the daytime?*
- *Has anyone **O**bserved you stop breathing during sleep?*
- *Do you have or are you being treated for high blood **P**ressure?*
- *Is your **B**MI greater than 35?*
- *Is your **A**ge older than 50 years?*
- *Is your **N**eck circumference greater than 40 cm?*
- *Is your **G**ender male?*

39.

The respiratory therapist is evaluating a patient who is 45 pack-year smoker and has dyspnea with exertion, uses accessory muscles when breathing, and has an increased A-P chest diameter.

Which of the following conditions should the respiratory therapist suspect?

Emphysema

Bronchitis

Asthma

Chronic pneumonia

Correct answer: Emphysema

The patient's symptoms are most consistent with emphysema. While some of the patient's symptoms are nonspecific, the increased A-P chest diameter is most commonly seen with emphysema, and is unlikely to occur with bronchitis, asthma, or chronic pneumonia.

40.

Which of the following can a transilluminator be used for in a newborn patient?

Diagnosing a pneumothorax

Diagnosing pneumonia

Treating hyperbilirubinemia

Providing data on blood oxygenation

Correct answer: Diagnosing a pneumothorax

A transilluminator can be used to evaluate for the increased transmission of light in the chest cavity, which can be an indicator of a pneumothorax.

A transilluminator is not useful for diagnosing pneumonia. Hyperbilirubinemia is treated using phototherapy, but a transilluminator is not used to provide this therapy. A pulse oximeter can provide data on blood oxygenation, but a transilluminator will not.

41.

Which of the following interventions should be recommended to reduce a patient's likelihood of developing epiglottitis?

Following routine vaccination schedules

Avoiding sugary or spicy foods

Taking prophylactic antibiotics

Breastfeeding as long as possible

Correct answer: Following routine vaccination schedules

Epiglottitis is caused by bacterial infections. Haemophilus influenzae type B is the most common organism that causes epiglottitis, but the risk of developing this infection is significantly reduced when routine vaccination schedules are followed.

Epiglottitis is not caused by diet and avoiding certain foods is not a good recommendation to avoid epiglottitis. While epiglottitis is caused by bacterial infections, using prophylactic antibiotics is not recommended. There are several benefits to breastfeeding, but it is not known to decrease the risk of epiglottitis.

42.

A patient has an SpO2 of 90%, a PaO2 of 70 mm Hg, and an FiO2 of 50%. What is this patient's P/F ratio?

140

180

350

71

Correct answer: 140

The P/F ratio, also called the PaO2/FiO2 ratio, measures the patient's oxygenation compared to the FiO2 provided. This value is found by dividing the PaO2 by the FiO2, keeping in mind that the percentage of the FiO2 should be expressed as a fraction.

For this situation, the equation would be 70/0.5 = 140. The patient's SpO2 is not a factor for this ratio.

43.

Which of the following are normal heart sounds?

1. S1
2. S2
3. S3
4. S4

1 and 2 only

2 and 3 only

1, 2, 3, and 4

1, 2, and 3 only

Correct answer: 1 and 2 only

The S1 and S2 heart sounds are normal and expected. S1 represents the closure of the atrioventricular valves, while S2 represents the closing of the semilunar valves.

S3 is thought to result from blood rushing into the ventricles during early ventricular diastole. S4 is thought to result from atrial contraction. S3 and S4 are not normally heard in healthy adults.

44.

Which method of transport describes the means of transport used for most of the CO_2 in blood?

Ionized as bicarbonate in erythrocytes

Dissolve in physical solution

Chemically combined with protein

Ionized as bicarbonate in plasma

Correct answer: Ionized as bicarbonate in erythrocytes

Somewhere between 65% and 80% of CO_2 is transported as bicarbonate in erythrocytes. Carbonic anhydrase found within erythrocytes catalyzes the hydrolysis of CO_2, making this reaction occur at significantly higher levels within erythrocytes than in plasma.

CO_2 can chemically combine with proteins in plasma or dissolve into the plasma, but these are not the transportation method used for most of the CO_2 in blood.

45.

When interpreting an EKG, the respiratory therapist recognizes that the P wave represents which of the following?

Depolarization of the atria

Depolarization of the ventricles

Repolarization of the atria

Repolarization of the ventricles

Correct answer: Depolarization of the atria

The P wave represents depolarization of the atria and correlates with atrial contraction.

Depolarization of the ventricles is indicated by the QRS complex. Repolarization of the atria occurs concurrently with depolarization of the ventricles, and the electrical signal this causes it is obscured by the QRS complex. Repolarization of the ventricles is indicated by the T wave.

46.

The respiratory therapist is reviewing a patient's chart and notes that the patient has "infrequent PVCs." Which of the following does this mean for this patient?

This does not require treatment or indicate any serious disease.

The patient is likely to have a serious cardiac disease, but does not require treatment at this time.

The patient is likely to need a pacemaker.

The patient should be started on an antiarrhythmia drug.

Correct answer: This does not require treatment or indicate any serious disease.

Infrequent premature ventricular contractions (PVCs) are technically abnormal but present in many patients. This incidental finding is not a cause for concern and does not require treatment if the PVCs are infrequent.

PVCs are unlikely to indicate a serious cardiac disease. Pacemakers are not used to treat PVCs. Patients with frequent PVCs may be treated with an antiarrhythmia drug, but this is not necessary for infrequent PVCs.

47.

The respiratory therapist is evaluating a 54-year-old female without a history of cardiopulmonary disease. Which of the following clinical characteristics is LEAST likely to indicate that this patient has a pulmonary embolism (PE)?

Jugular venous distension

Dyspnea at rest or with exercise

Tachypnea

Cough

Correct answer: Jugular venous distension

Jugular venous distention (JVD) is only present in 14% of patients without cardiopulmonary disease who have a PE. Dyspnea at rest or with exercise is present in 73% of these patients, tachypnea is present in 54%, and a cough is present in 34%.

JVD is the least likely to be present in these patients.

48.

Which of the following methods for diagnosing obstructive sleep apnea is considered the "gold standard"?

A full-night polysomnogram (PSG) in a sleep laboratory monitored by a sleep technologist

A full-night polysomnogram (PSG) that is monitored by a sleep technologist regardless of the location

Any direct observation of OSA by a clinician, whether in a sleep laboratory or while a patient is sleeping in a hospital setting

A home sleep apnea test (HSAT)

Correct answer: A full-night polysomnogram (PSG) in a sleep laboratory monitored by a sleep technologist

The "gold standard" for diagnosing OSA is a polysomnogram (PSG) that covers the patient's entire night of sleep and is administered in a sleep lab and monitored by a sleep technologist.

Having a PSG that is administered in a sleep laboratory is considered superior to other locations; thus, location is a factor. Direct observation of OSA could be used to diagnose it but, typically, a more comprehensive study is used. A home sleep apnea test (HSAT) may be used to diagnose OSA and is becoming increasingly common due to its convenience over other, more complicated tests. An HSAT is, however, not the "gold standard" for diagnosing OSA.

49.

Which of the following BEST describes a pleural friction rub?

A creaking or grating sound that typically occurs during inspiration and is usually localized to a discreet site on the chest wall

A creaking or grating sound that typically occurs during expiration and is usually localized to a discreet site on the chest wall

A creaking or grating sound that typically occurs during inspiration and is localized to one lobe, but not usually to a discreet site

A creaking or grating sound that typically occurs during expiration and is localized to one lobe, but not usually to a discreet site

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Correct answer: A creaking or grating sound that typically occurs during inspiration and is usually localized to a discreet site on the chest wall

A pleural friction rub is a creaking or grating sound that is typically heard during inspiration, not expiration. It may be heard during both in some cases, but will be more prominent during inspiration.

Pleural friction rubs are usually localized to the specific, discreet site on the chest wall where the friction between the pleural surfaces is occurring.

50.

Which of the following conditions would be LEAST likely to cause a heart murmur when auscultating the patient's heart sounds?

Atrial fibrillation

Aortic valve disease

Mitral valve disease

Tricuspid valve insufficiency

Correct answer: Atrial fibrillation

Heart murmurs occur when blood flows in a turbulent fashion through heart structures that are narrowed. Heart murmurs are caused by incomplete closure of heart valves in most situations. Aortic valve disease, mitral valve disease, and tricuspid valve insufficiency are all conditions affecting the heart valves and all can lead to heart murmurs.

Atrial fibrillation is related to the electrical conduction of the heart and will not result in a heart murmur, but will cause an abnormal heart rhythm.

51.

The respiratory therapist is evaluating a patient by percussion of the chest wall and notes dullness. Which of the following could cause dullness upon percussion of the chest wall?

Pulmonary edema

Normal lung tissue

Emphysema

Tension pneumothorax

Correct answer: Pulmonary edema

Dullness is a sound of medium intensity and pitch of short duration. It is produced over areas that contain a higher proportion of tissue or fluid than air. Pulmonary edema would cause dullness due to the accumulation of fluid in the lungs.

Normal lung tissue would create resonance with percussion. Emphysema would likely cause hyperresonance. A tension pneumothorax would likely cause tympany.

52.

The respiratory therapist is reviewing the laboratory results of a patient with a new cough and notices that the patient's sputum culture shows the presence of *Candida* growth. Which of the following does this likely indicate?

Contamination

Community-acquired pneumonia (CAP)

Septicemia

Nosocomial infection

Correct answer: Contamination

Candida is a bacteria that typically lives in the body and does not normally cause infections. The finding of Candida growth likely indicates contamination of the sputum sample and does not require further action.

Community-acquired pneumonia (CAP) is not normally caused by Candida. Septicemia and nosocomial infection are certainly not a reasonable inference from this result.

53.

The respiratory therapist is evaluating the ABG of a preterm infant who is being oxygenated using a nasal cannula at 3 L/min and who is one hour old. The patient's ABG is as follows:

- pH 7.33
- PaCO2 47 mm Hg
- PaO2 81 mm Hg
- HCO3- 19 mEq/l
- BE -4

Which of the following interventions is necessary for this patient?

Decrease or turn of the nasal cannula

Intubate the patient and begin mechanical ventilation

Begin providing oxygen using an oxygen hood instead of a nasal cannula

No intervention is needed

Correct answer: Decrease or turn off the nasal cannula

Retinopathy of Prematurity (ROP) is caused by hyperoxygenation of a newborn. The goal PaO2 to avoid ROP should be less than 80 mm Hg. A preterm infant who is one hour old should have PaO2 of 52 to 69 mm Hg typically, making the nasal cannula likely to be unnecessary for this patient.

All the other ABG values are normal for a preterm infant who is one hour old.

54.

Which of the following is TRUE for a patient who is not on comfort care and who has a Glasgow Coma Score (GCS) of 7?

The patient must have their airway secured, preferably by endotracheal intubation if possible

The patient should be evaluated for the ability to protect their airway and only endotracheally intubated if they are unable to do so

The patient should be closely monitored, as endotracheal intubation will likely be necessary if the GCS is lower than 7

No intervention or advanced monitoring is needed for this patient

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Correct answer: The patient must have their airway secured, preferably by endotracheal intubation if possible

Any patient who has a GCS of lower than 8 and has not opted out of life-saving interventions should have their airway secured. A GCS of lower than 8 is a sufficient reason to intubate a patient.

If the patient does not require further evaluation, a GCS of less than 8 is sufficient evaluation to determine that intubation is necessary. The statement that a GCS of less than 7 requires intubation is incorrect; it is at a GCS of less than 8 that this becomes necessary. The statement that no intervention or advanced monitoring is needed for this patient is incorrect.

55.

You are called to evaluate a patient who may have a complete upper airway obstruction. Which of the following is NOT expected to be present if the patient has a complete upper airway obstruction?

Stridor on inspiration

Cyanosis

Extreme panic

Sternal retractions

Correct answer: Stridor on inspiration

Stridor is a crowing, tasing sound on inspiration caused by a partial upper airway obstruction. The presence of stridor indicates that there is still some airflow in the upper airways and that the obstruction is not complete.

Cyanosis is certainly possible with complete upper airway obstruction. A conscious patient with a complete upper airway obstruction will exhibit extreme panic and will have sternal, intercostal, and epigastric retractions until respiratory arrest occurs.

56.

Which of the following terms BEST describes paradoxical respirations?

Respirations in which the chest moves in on inspiration and out on expiration

Respirations in which the respiratory rate oscillates between periods of rapid, deep breaths and slow, shallow breaths

Respirations in which series of breaths alternate between using the diaphragm and the rib cage muscles

Respirations that cause no movement of the chest or abdomen

Correct answer: Respirations in which the chest moves in on inspiration and out on expiration

Paradoxical respirations are respirations in which the chest moves opposite of normal, meaning that it moves in on inspiration and out on expiration.

Respirations in which the respiratory rate oscillates between periods of rapid, deep breaths and slow, shallow breaths indicate a periodic breathing pattern, not paradoxical respirations. Respirations in which series of breaths alternate between using the diaphragm and rib cage muscles describes respiratory alternans. There is no condition in which respirations occur that cause no movement of the chest or abdomen.

57.

Which of the following BEST describes an infection in the lung that is characterized by a localized accumulation of pus and destruction of the surrounding tissue?

Lung abscess

Tubercle

Pneumonia

Granuloma

Correct answer: Lung abscess

An infection in the lung that is characterized by a localized accumulation of pus and destruction of the surrounding tissue describes a lung abscess.

Pneumonia is an acute inflammation of the lung parenchyma caused by infectious organisms. A granuloma or a tubercle are interchangeable terms describing lung lesions caused by tuberculosis, and describe an area of encapsulated bacilli.

58.

A nurse calls you to evaluate a patient who has begun exhibiting Biot's respiration. Which of the following is MOST likely to cause Biot's respiration?

Stroke

Metabolic acidosis

Status asthmaticus

Acute respiratory distress syndrome (ARDS)

Correct answer: Stroke

Biot's respiration is a chaotic breathing pattern that creates frequent irregularities in rate and tidal volume. This respiratory pattern eventually deteriorates into agonal breathing, then apnea. Biot's respiration is normally caused by damage to the medulla or pons. A stroke, or brain attack, is the only condition listed that could cause damage to these neurological structures.

59.

The respiratory therapist is reviewing the history of a 45-year-old male who has emphysema. The patient reports that he never smoked, but that COPD runs in his family. Which of the following is MOST likely true about this patient?

He has an alpha-1 antitrypsin deficiency

He is hiding his smoking history

His diagnosis of emphysema may be a misdiagnosis

His emphysema is likely secondary to a cancerous pathology

Correct answer: He has an alpha-1 antitrypsin deficiency

While emphysema is most often caused by smoking, it can also be caused by an alpha-1 antitrypsin deficiency. Patients who have an alpha-1 antitrypsin deficiency will often develop emphysema in the fourth to fifth decade of life, compared to those who develop emphysema from smoking, who typically develop symptoms in the sixth to seventh decade of life. Patients with alpha-1 antitrypsin deficiency also tend to have a family history of alpha-1 antitrypsin deficiency.

It is possible that he is hiding a smoking history, but an alpha-1 antitrypsin deficiency is more likely, given the other factors described. There is nothing to indicate that his emphysema may have been misdiagnosed or that it is secondary to a malignancy.

60.

The respiratory therapist is reviewing a patient's chart and notes that the patient's recent creatine level is elevated. What impact does this have on the patient's respiratory care?

This could indicate renal impairment that could lead to impaired pulmonary gas exchange.

This could indicate decreased myocardial circulation, which could affect systemic circulation.

This indicates anaerobic metabolism from decreased oxygen supply to tissues.

This abnormality has no impact on the patient's respiratory care.

Correct answer: This could indicate renal impairment that could lead to impaired pulmonary gas exchange.

Creatinine is a waste product that is removed by the kidneys and is an indicator of kidney function. Renal impairment could lead to congestive heart failure and pulmonary edema, which could subsequently lead to impaired pulmonary gas exchange.

Creatinine may be elevated during anaerobic metabolism, as renal perfusion is affected by the cause of the anaerobic metabolism, but is not a good indicator of anaerobic metabolism. Creatinine levels are not related to myocardial circulation.

61.

Which of the following BEST describes what D-dimer is?

A protein fragment that is found in the blood when a fibrin clot is dissolving

A test that determines how long clot formation takes using a specific clotting pathway

An enzyme that is produced to dissolve a pulmonary embolism (PE) or other fibrin clot

A variable test that is calculated into an international normalized ratio (INR) to describe coagulation timing

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Correct answer: A protein fragment that is found in the blood when a fibrin clot is dissolving

D-dimer is a protein fragment that is found in the blood when a fibrin clot is dissolving and can indicate the presence of a pulmonary embolism (PE), deep vein thrombosis (DVT), or disseminated intravascular coagulation (DIC).

D-dimer is a protein fragment that results from a fibrin clot dissolving, and is not an enzyme that promotes this process. Prothrombin time (PT) or partial thromboplastin time (PTT) are used to evaluate how long clot formation takes using two different specific clotting pathways. PT results are variable, and the test is calculated into an international normalized ratio (INR) to describe coagulation timing of that clotting pathway.

62.

The respiratory therapist is treating a patient who is suspected to be in septic shock. Which of the following laboratory tests would NOT be used to evaluate for septic shock?

Lactate dehydrogenase (LDH)

Procalcitonin

White blood cells (WBC)

Lactic acid

Correct answer: Lactate dehydrogenase (LDH)

Lactate dehydrogenase (LDH) is an enzyme that is used to assess for tissue damage that can occur with many conditions. LDH is not used to evaluate for septic shock.

Lactic acid builds up as a byproduct of anaerobic cellular metabolism and is elevated when oxygen delivery to peripheral tissues is insufficient. Lactic acid levels are used to evaluate for septic shock. Procalcitonin is released in response to bacterial infections, especially in the case of sepsis. Procalcitonin levels correlate with the severity of the infection and are used to evaluate for sepsis. White blood cell (WBC) levels increase as part of the immune response to infection or stress and elevated WBC level is an indicator of sepsis.

63.

Which of the following is NOT a component of the Silverman scoring system?

Expiratory wheezing

Intercostal retractions

Nasal flaring

Xiphoid retractions

Correct answer: Expiratory wheezing

The Silverman scoring system scores five criteria, with a score of 0 being the best and a score of 10 being the worst. The five criteria the score is based on are intercostal retractions, xiphoid retractions, chest lag or paradoxical breathing, nasal flaring, and an expiratory grunt.

64.

A lesion found during a patient's chest CT is described as a nodule. What is TRUE about this finding?

The lesion is less than 3 cm in diameter

The patient likely has lung cancer

A transthoracic needle biopsy is needed to further evaluate this lesion

The lesion has a diameter of at least 14 mm

Correct answer: The lesion is less than 3 cm in diameter

A nodule is a lesion seen on a CT that is less than 3 cm in diameter, while a mass is a lesion that is greater than 3 cm.

A nodule does not necessarily mean that a patient has lung cancer and further information is needed about the nodule to make this determination. A transthoracic needle biopsy could be needed if further evaluation of this lesion is indicated, but this requires consideration of the broader clinical context. The presence of a nodule does not indicate that the lesion is at least 14 mm; however, a wall thickness of 14 mm or greater for a cavitary lesion may represent cancer.

65.

Which of the following is LEAST likely to increase the risk of bronchopulmonary dysplasia (BPD) for a newborn patient?

Hypoxia

Barotrauma

Volutrauma

Aspiration

Correct answer: Hypoxia

There are several possible causes for bronchopulmonary dysplasia (BPD), but it primarily occurs with prolonged positive pressure ventilation and supplemental oxygen use. Hypoxia is not a known cause of BPD.

Barotrauma, volutrauma, and aspiration are all possible causes of BPD.

66.

The respiratory therapist is evaluating a 62-year-old female and notes digital clubbing. Which of the following diseases does this finding indicate the patient could have?

Any disease that causes chronic hypoxemia

Chronic obstructive pulmonary disease (COPD)

Emphysema

Any disease that causes chronic hypercapnia

Correct answer: Any disease that causes chronic hypoxemia

While chronic obstructive pulmonary disease (COPD) is the most common cause of digital clubbing, it is by no means the only condition that causes this. Other causes can include bronchogenic cancer, bronchiectasis, interstitial lung disease, liver disease, inflammatory bowel disease, and cystic fibrosis. Digital clubbing occurs due to chronic hypoxemia (not hypercapnia), and any disease that causes chronic hypoxemia should be considered.

67.

The respiratory therapist is called to evaluate a 67-year-old male who has end-stage COPD and comes into the Emergency Department for an exacerbation. Which of the following thoracic abnormalities are you MOST likely to note?

Increased anteroposterior diameter

Pectus carinatum

Increased thoracic expansion

Kyphosis

Correct answer: Increased anteroposterior diameter

An increased thoracic anteroposterior diameter, also called "barrel chest," is caused by the hyperinflation that chronic COPD creates.

Pectus carinatum causes an increased thoracic anteroposterior diameter, but this is a congenital deformity that causes the sternum to protrude and is not typically caused by a disease. Decreased thoracic expansion, not increased thoracic expansion, is normally seen with COPD. Kyphosis is a spinal deformity causing abnormal anteroposterior curvature and is not caused by COPD.

68.

You are evaluating the respiratory status of a patient who reports that the only medication he uses daily is furosemide. Which of the following conditions is this medication MOST likely being used to treat?

Heart failure

Hypertension

Hyperkalemia

Endocarditis

Correct answer: Heart failure

Furosemide (Lasix) is a loop diuretic that is used to remove excess fluid. Daily use of this medication is most commonly prescribed for heart failure.

Furosemide can be used to treat hypertension, but this is not a common use of it, especially when it is the only medication used. Furosemide will reduce potassium levels, but is not commonly used to treat hyperkalemia. Furosemide is not used to treat endocarditis.

69.

The respiratory therapist is evaluating a patient who has heart failure. What is the BEST way to evaluate for pitting pedal edema?

Press on the soft tissues of the feet or ankles and see if the pressure leaves an indentation

Press on the soft tissues of the feet or ankles and feel if the tissues are firm or soft

Visualize the soft tissues of the feet or ankles and see if there is fluid seeping from the skin

Visualize the soft tissues of the feet or ankles and see if they look swollen or larger than expected

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Correct answer: Press on the soft tissues of the feet or ankles and see if the pressure leaves an indentation

Pitting edema leaves an indentation when pressed, and the degree of pitting edema is evaluated by the indentation that is caused when the area is depressed.

Feeling the firmness of the tissues may provide some indication if pitting edema is present, but is not the best way to evaluate pitting edema. Visualizing the area for weeping or flooding can be an indicator of weeping edema but not pitting edema. Visualization of the area may provide some indication if pitting edema is present, but is not the best way of evaluating it.

70.

Which of the following patients is MOST at risk for meconium aspiration syndrome (MAS)?

A post-term infant who was hypoxic in utero

A full-term infant whose mother has had four previous pregnancies

A pre-term infant who was born at 33 weeks gestation

An infant who has respiratory distress syndrome (RDS)

Correct answer: A post-term infant who was hypoxic in utero

Hypoxia in utero causes breathing in utero that may cause meconium to be passed through the vocal cords and into the lungs. Post-term infants are more likely to pass meconium in utero, making MAS more likely for this patient.

A full-term infant is more likely to have MAS than a preterm infant, but this infant has no other risk factors. Preterm infants are at low risk for MAS. RDS is normally associated with preterm birth and does not increase the risk of MAS.

71.

The respiratory therapist is interviewing a patient who states that they smoked 30 cigarettes per day for twelve years, then cut back to 10 cigarettes per day four years ago. How would this be BEST reported?

20 pack-years smoking history

16 pack-years smoking history

12 years of 18 pack-years smoking history followed by 4 years of 2 pack-years

18 pack-years decreasing to 2 pack-years

Correct answer: 20 pack-years smoking history

Smoking history is recorded in pack-years and is determined by multiplying the number of packs smoked per day by the number of years smoked. This calculation does not take into account changes in smoking habits and reports overall cigarette usage in one's lifetime.

*The calculation for the first 12 years is (30 cigarettes/20 cigarettes per pack)*12 years = 18 pack-years.*

*The calculation for the last four years is (10 cigarettes/20 cigarettes per pack)*4 years = 2 pack-years.*

The sum of the patient's smoking history is therefore 20 pack-years.

72.

When performing a clinical assessment for hypoxia, which of the following symptoms is indicative of severe hypoxia?

Loss of coordination

Restlessness

Headaches

Mild hypertension

Correct answer: Loss of coordination

Loss of coordination is a neurological sign of severe hypoxia that can be noted during a clinical exam.

Restlessness, headaches, and mild hypertension are all symptoms of hypoxia but are indicative of mild to moderate hypoxia.

73.

The respiratory therapist is evaluating a patient who has been diagnosed with asthma, has wheezing or coughing once a week, and has a PEF value of 85% of predicted. Which of the following BEST describes the classification of this patient's asthma?

Intermittent

Mild persistent

Moderate persistent

Severe persistent

Correct answer: Intermittent

Intermittent asthma is the least severe of the four asthma classifications. Intermittent asthma is classified as asthma with symptoms of wheezing or coughing no more than twice a week. Patients with intermittent asthma also typically have PEF (peak expiratory flow) values of at least 80% of predicted.

74.

The respiratory therapist is treating a two-year-old male with laryngotracheobronchitis. Which of the following treatments will NOT be part of this patient's care?

Antibiotics

Aerosolized racemic epinephrine

Dexamethasone

O2 therapy

Correct answer: Antibiotics

Laryngotracheobronchitis (croup) is inflammation of the larynx and subglottic area that is typically caused by parainfluenza virus. Antibiotics will be ineffective against a viral infection.

Aerosolized racemic epinephrine, oral dexamethasone, and O2 therapy are used in the treatment of laryngotracheobronchitis.

75.

Bronchopulmonary dysplasia (BPD) occurs in four distinct stages. In which stage of BPD do emphysematous alveoli develop?

Stage 4

Stage 1

Stage 2

Stage 3

Correct answer: Stage 4

Stage 4 of bronchopulmonary dysplasia (BPD) occurs 30 days or more after birth and includes formation of emphysematous alveoli, atelectasis, and a continuation of interstitial fibrosis. The other stages of BPD occur between 2 and 20 days after birth.

76.

The respiratory therapist is called to evaluate a 54-year-old male who is suspected of having a myocardial infarction (MI). A test for which of the following would be used in determining if the patient is having an MI?

Troponin I

B-type natriuretic peptide (BNP)

Hemoglobin

Lactic acid

Correct answer: Troponin I

Troponin I is an enzyme that is specific to cardiac tissue and is released if cardiac tissue is injured. Elevations in troponin I levels are used to diagnose MIs.

BNP levels can help to differentiate pulmonary edema between cardiogenic and acute lung injury sources, but are not used to diagnose MIs. Hemoglobin is used to diagnose anemia, and lactic acid is used to indicate anaerobic metabolism that would be expected in shock.

77.

The respiratory therapist is present at a delivery. One minute after the delivery, the patient has a heart rate of 143 and a strong cry with stimulation. The patient's body is pink, but his extremities are blue. The patient is limp.

What would be this patient's APGAR score?

7

6

5

4

Correct answer: 7

The APGAR score is used to assess the general condition of a newborn after birth and is assessed at 1 minute and 5 minutes after birth. The APGAR score uses a score of 0-10 and evaluates:

- *Appearance (0 for generalized pale and blue, 1 for pink body but blue extremities, and 2 for completely pink)*
- *Pulse (0 for no pulse, 1 for < 100 beats/minute, and 2 for > 100 beats/minute)*
- *Grimace (0 for no response to irritation, 1 for grimace, and 2 for a sneeze, cough, or cry)*
- *Activity (0 for limp, 1 for some flexion, and 2 for active flexion)*
- *Respiration (0 for absent respiration, 1 for slow and irregular respirations, and 2 for strong cry)*

For this patient, their appearance provides a score of 1, their pulse provides a score of 2, their grimace provides a score of 2, their activity provides a score of 0, and their respiration provides a score of 2.

78.

Which chest radiograph position is MOST commonly used?

Posteroanterior (PA)

Anteroposterior (AP)

Lateral

Oblique

Correct answer: Posteroanterior (PA)

The posteroanterior (PA) position is the most commonly used position. In this position, the x-ray passes through the patient from the back to the anterior chest.

An anteroposterior (AP) position is the same as the PA position but reversed, with the x-ray passing through the chest from the front of the chest to film behind the patient's back. A lateral position is obtained from the patient's side and passes through the chest laterally. The oblique position is obtained with the patient turned 45 degrees to either the right or left.

79.

Meconium-stained amniotic fluid is noted during the delivery of a term infant. The patient's one-minute APGAR score is 10. Which of the following interventions should the respiratory therapist recommend?

Only routine interventions are necessary

Through suctioning of the infant

Intubation

Intubation and suctioning

Correct answer: Only routine interventions are necessary

A patient who has a heart rate of > 100 beats/min, a strong respiratory effort, and good muscle tone does not require suctioning after birth. Intubation and/or suctioning may be necessary if the patient does not meet any of these criteria after birth.

80.

You are a respiratory therapist who is called by a nurse in the Emergency Department who informs you that a 43-year-old male who was in a house fire has just arrived. He has burns covering over 13.5% of his body. The nurse tells you that his respiratory rate is 22, his O2 saturation is 95% on room air, and his heart rate is 91 beats per minute.

Which of the following interventions should you recommend while you are on the phone with the nurse?

Obtain a STAT ABG

Place the patient on 2L of O2 via nasal cannula to maintain an SpO2 > 95%

Encourage the patient to take slow, deep breaths

Keep the patient in a prone position if possible

Correct answer: Obtain a STAT ABG

Pulse oximetry is not able to distinguish oxyhemoglobin from methemoglobin and carboxyhemoglobin. An ABG is needed to measure SaO2 levels for this patient.

Placing the patient on 2L of O2 via nasal cannula could help to reduce the half-life of carboxyhemoglobin, but 100% O2 should be administered for this purpose, and the goal for oxygen administration is not to maintain a specific SpO2. Encouraging the patient to take slow, deep breaths is not as important as obtaining a STAT ABG. Prone positioning would not be recommended for this patient based on the available data.

81.

The respiratory therapist is treating a patient with non-small cell lung cancer. Which of the following is NOT a type of treatment used in treating this type of cancer?

Lung transplantation

Surgical resection

Radiotherapy

Systemic therapy

Correct answer: Lung transplantation

Lung transplantation is almost never used as a treatment for non-small cell lung cancer.

Surgical resection, radiotherapy, and systemic therapy such as traditional chemotherapy, targeted, and immune checkpoint inhibitor therapies are used to treat non-small cell lung cancer.

82.

Which of the following laboratory tests is the BEST indicator that a patient is experiencing heart failure?

B-type natriuretic peptide (BNP)

Troponin I

Sodium

There is no single laboratory test that indicates heart failure

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Correct answer: B-type natriuretic peptide (BNP)

BNP is secreted in response to increased cardiac muscle stretch and is used to evaluate patients for heart failure.

Troponin I indicates damage to myocardial cells. Sodium levels will be affected by heart failure, but are not the best indicator that heart failure is occurring. A BNP level is a single test that can indicate heart failure.

83.

Which of the following Glasgow Coma Scores (GCSs) means that the patient is comatose but not completely unresponsive?

6

3

14

1

Correct answer: 6

The Glasgow Coma Score (GCS) is a score that is used to evaluate a patient's neurological function. This score is obtained by evaluating three criteria: best eye response, best verbal response, and best motor response. Each criterion is graded on a scale where 1 is the lowest, and the high end ranges between 4 and 6, depending upon the criteria. The worst score a patient can have is 3, and the best is 15.

A GCS of 8 or less means that the patient is comatose, while a GCS of 3 indicates the patient is totally unresponsive. A GCS of 4-8 meets the specifications described in the question, and 6 is the only answer choice within that range.

84.

The respiratory therapist is present at a delivery when the baby is born with an APGAR score of 4 at one minute after delivery. What does this score indicate?

Moderate asphyxia

Mild asphyxia

Severe asphyxia

Normal score

Correct answer: Moderate asphyxia

An APGAR score between 4 and 6 indicates moderate asphyxia; the patient should be stimulated and O2 should be administered.

An APGAR of 7 to 10 is normal and requires routine post-delivery interventions. An APGAR of 0 to 3 indicates severe asphyxia; these patients require immediate resuscitation with ventilatory assistance.

85.

The respiratory therapist is using the STOP-BANG questionnaire to screen a patient for obstructive sleep apnea (OSA) and the patient scores a 2 on this questionnaire. Which of the following is CORRECT about this patient?

This patient has a low probability of OSA

This patient does not have OSA

The patient has a high probability for some degree of OSA

The patient has a high probability for moderate to severe OSA

Correct answer: This patient has a low probability of OSA

The STOP-BANG questionnaire is a commonly used questionnaire to screen for OSA and tests eight factors. A score of 3 or greater indicates that OSA is probable, while a score of 5 or higher indicates that moderate to severe OSA is probable. A score lower than 3 indicates that the patient has a low probability of OSA, but can never absolutely rule it out.

86.

A patient has the following ABG result:

pH 7.31

PaCO2 51 torr

PaO2 69 torr

HCO3- 22 mEq/l

BE -0.9

Which of the following is LEAST likely to cause this result?

Overdose on cocaine

Overdose on heroin

Traumatic brain injury

Recent use of propofol as an anesthetic

Correct answer: Overdose on cocaine

The patient has a low pH, indicating an acidotic state. The patient has an elevated PaCO2, indicating that the cause of the acidosis is likely due to respiratory causes. The HCO3 is normal which, when coupled with the abnormal pH, indicates that this is acute respiratory acidosis. With a low PaO2, this seems to be related to hypoventilation. An overdose on heroin, a traumatic brain injury, and the recent use of propofol as an anesthetic can all lead to hypoventilation.

An overdose on cocaine, however, will be more likely to lead to hyperventilation and will not cause respiratory acidosis.

87.

The respiratory therapist is providing percussion to a 25-year-old female who has cystic fibrosis. Which of the following is a consideration when mobilizing secretions in the lower anterior lobes?

Percussion over breast tissue should be avoided

Manual percussion is generally more effective than mechanical percussion in this area

Percussion should never be performed if the patient is pregnant

Percussion is contraindicated for this patient

Correct answer: Percussion over breast tissue should be avoided

Percussion should not be performed over the female breast tissue.

Mechanical percussion is generally more effective than manual percussion. Percussion can still be performed if the patient is pregnant; however, additional care should be taken. Percussion is not contraindicated for this patient based on the information given.

88.

Which of the following correctly describes the calculation used to determine body mass index (BMI)?

Weight (kg) / [height^2 (m^2)]

Weight (kg) / height (m)

Weight (kg) / body surface area (cm^2)

Body surface area (cm) / Weight (kg)

Correct answer: Weight (kg) / [height^2 (m^2)]

Calculating the patient's BMI can be an important component of understanding a patient's nutritional status and can lead to modification of some interventions. The BMI is calculated by dividing the patient's weight in kilograms by the square of their height in meters.

89.

The respiratory therapist is performing an EKG on a patient who has atrial fibrillation (A-fib). Which of the following should the respiratory therapist expect to see for the duration of the P wave?

A P wave will not be present

Greater than 0.10 seconds

Less than 0.06 seconds

0.06 to 0.10 seconds

Correct answer: A P wave will not be present

A-fib is characterized by uncoordinated electrical activity in the atria. A P wave is caused by coordinated electrical activity in the atria and is not seen in A-fib. If a P wave were present, it would normally be 0.06 to 0.10 seconds.

90.

Which muscles are used for normal ventilation?

The intercostal muscles and the diaphragm

Only the diaphragm

The diaphragm, intercostal muscles, and the scalene

The diaphragm, intercostal muscles, and the pectoralis major muscles

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Correct answer: The intercostal muscles and the diaphragm

The intercostal muscles and the diaphragm are the major muscles used during normal ventilation.

Accessory muscles are not used during normal ventilation, and include the scalene, the pectoralis major muscles, and the sternomastoid muscles.

91.

You are a respiratory therapist assisting in the care of a 72-year-old who has just experienced a return of spontaneous circulation (ROSC) after being in cardiac arrest for 18 minutes. You obtain an ABG from an existing arterial line immediately after ROSC and hand it to one of your colleagues to analyze. The AGB results are returned as follows:

pH 7.40

PaCO2 42 torr

PaO2 104 torr

HCO3- 26 mEq/L

BE 0.7

What is the BEST explanation for these results?

The patient's results may have been confused with another patient's

The patient has compensated respiratory acidosis

The patient's respiratory needs are being met following the cardiac arrest

The FiO2 should be increased

Correct answer: The patient's results may have been confused with another patient's

These ABG results are unrealistic for a patient who has just been in cardiac arrest for 18 minutes, and this likely indicates that the results are being misattributed.

This ABG does not indicate compensated respiratory acidosis. An ABG that is normal for this patient is more likely to have been the result of a labeling or reporting error than to indicate the patient's respiratory needs are being met. The FiO2 should not be adjusted based on these results, both because these results do not indicate this is needed and are not likely to be the patient's actual results.

92.

What are the implications that the presence of pedal edema may have on a patient's respiratory status?

The patient may be experiencing right-sided heart failure which could lead to respiratory implications

The patient has fluid that is accumulating throughout their body and that is also beginning to accumulate in the lungs

Pedal edema indicates a low level of activity and the patient is at a greater risk of developing atelectasis

Pedal edema does not have any respiratory implications

Correct answer: The patient may be experiencing right-sided heart failure which could lead to respiratory implications

Pedal edema is the accumulation of fluid in the subcutaneous tissues in the feet. The feet are the most dependent area of the body and typically the first site where this edema is noted. This can indicate that there is decreased blood return to the right side of the patient's heart and that the patient may be developing right-sided heart failure, which can lead to respiratory implications.

Pedal edema does not necessarily indicate that fluid is also accumulating in the lungs. Pedal edema may improve with physical activity but is not caused by inactivity. Pedal edema does have potential respiratory implications.

93.

The respiratory therapist is caring for a three-year-old female who was found unconscious in a shallow pond. Which of the following interventions is INCORRECT for this patient?

Position the patient supine for best visualization and management of their airway

Begin mechanical ventilation if acute respiratory distress syndrome (ARDS) develops

Clear the airway using bronchoalveolar lavage if foreign matter has been aspirated

Manage the patient's temperature

Correct answer: Position the patient supine for best visualization and management of their airway

Management of a near-drowning patient includes positioning the patient in the prone position if possible to facilitate airway clearance.

Near-drowning patients should be mechanically ventilated if ARDS develops. Bronchoalveolar lavage may be necessary for this patient, as aspiration of foreign materials is common in drownings where sand, mud, or dirt may be present in the water, as would be likely in a shallow pond. Temperature management is necessary as hypothermia can quickly develop when a patient is submerged.

94.

Which of the following BEST defines sleep apnea?

Periods of complete cessation of airflow while sleeping that last for more than 10 seconds

Periods of complete cessation of airflow while sleeping that last for more than 15 seconds

A decrease of at least 30% in airflow while sleeping that results in a decrease in O2 saturation of at least 3%

A decrease of at least 90% in airflow while sleeping that results in a decrease in O2 saturation of at least 3%

Correct answer: Periods of complete cessation of airflow while sleeping that last for more than 10 seconds

Sleep apnea is periods of complete cessation of airflow while sleeping. These periods must each last for at least 10 seconds for them to be considered apneic periods.

While periods of 15 seconds would also be considered to be apnea, this timeframe is too long and does not fully describe sleep apnea. Decreases in airflow while sleeping of 30% to 90% that result in a decrease in O2 saturation of at least 3% defines hypopnea, not apnea.

95.

Which of the following is the MOST concerning condition that should be monitored for in a patient with a penetrating chest trauma?

Tension pneumothorax

Hemothorax

Acute costochondritis

Traumatic brain injury (TBI)

Correct answer: Tension pneumothorax

A tension pneumothorax occurs when the pleural lesion of a penetrating chest trauma acts as a one-way valve, allowing air to enter into the pleural space and progressively expanding the pleural cavity. The unilateral increase in pressure can result in a mediastinal shift and lead to cardiovascular collapse and death.

A hemothorax is an accumulation of blood in the pleural cavity and may be caused by penetrating chest trauma. While concerning, it is not as serious as a tension pneumothorax. Acute costochondritis is inflammation of the cartilage that connects the ribs to the sternum and, while uncomfortable, is not a serious concern. Traumatic brain injury (TBI) is a serious concern that could lead to depression of respiratory centers, but is not a condition that should be monitored for in patients with a penetrating chest trauma unless other traumatic injuries have also occurred.

96.

Which of the following terms describes dyspnea that is triggered by assuming an upright position?

Platypnea

Orthopnea

Orthodeoxia

Trepopnea

Correct answer: Platypnea

Platypnea describes dyspnea that is triggered by assuming an upright position.

Orthopnea describes dyspnea that is triggered by reclining. Orthodeoxia describes oxygen desaturation that occurs when one assumes an upright position and is often connected with platypnea. Trepopnea describes dyspnea that is triggered when a patient with unilateral lung disease lies with their affected side in a dependent position.

97.

Which of the following is NOT a risk factor for obstructive sleep apnea (OSA)?

Vegan diet

Male gender

BMI greater than 35

Age of greater than 50 years old

Correct answer: Vegan diet

There are several risk factors for obstructive sleep apnea (OSA); these include male gender, BMI greater than 35, and age greater than 50.

A vegan diet has not been shown to increase the risk of developing OSA and there is some evidence to suggest that it may even improve OSA symptoms.

98.

The respiratory therapist is present at a delivery. Five minutes after the delivery, the patient has a heart rate of 84 and no cry or grimace, even with stimulation. The patient's body is pink, but her extremities are blue and she is limp. The patient also has slow, irregular respirations.

What would this patient's APGAR score be?

3

2

5

4

Correct answer: 3

The APGAR score is used to assess the general condition of a newborn after birth and is assessed at 1 minute and 5 minutes after birth. The APGAR score uses a score of 0-10 and evaluates:

- *Appearance (0 for generalized pale and blue, 1 for pink body but blue extremities, and 2 for completely pink)*
- *Pulse (0 for no pulse, 1 for < 100 beats/minute, and 2 for > 100 beats/minute)*
- *Grimace (0 for no response to irritation, 1 for grimace, and 2 for a sneeze, cough, or cry)*
- *Activity (0 for limp, 1 for some flexion, and 2 for active flexion)*
- *Respiration (0 for absent respiration, 1 for slow and irregular respirations, and 2 for strong cry)*

For this patient, their appearance provides a score of 1, their pulse provides a score of 1, their grimace provides a score of 0, their activity provides a score of 0, and their respiration provides a score of 1.

99.

You are the respiratory therapist evaluating a patient who has just completed an overnight polysomnogram. The patient's apnea-hypopnea index (AHI) was reported to be 16. Which of the following statements is TRUE about this finding?

The patient has moderate sleep apnea

The patient has severe sleep apnea

The patient has mild sleep apnea

This finding is normal

Correct answer: The patient has moderate sleep apnea

The apnea-hypopnea index (AHI) represents the number of apneic and hypopneic episodes occurring per hour during a polysomnogram. An AHI interpretation depends on the following ranges:

- *< 5, normal*
- *5-15, mild sleep apnea*
- *15-30, moderate sleep apnea*
- *> 30, severe sleep apnea*

This patient falls into the range of moderate sleep apnea.

100.

Which of the following is LEAST likely to be a cause of dyspnea in adults?

Deficiency of pulmonary surfactant

Increased airway resistance

Abnormal chest wall

Anxiety

Correct answer: Deficiency of pulmonary surfactant

Deficiency of pulmonary surfactant is primarily a respiratory condition affecting neonates or young infants and is very uncommon in adults.

Increased airway resistance, an abnormal chest wall, and anxiety are all possible causes of dyspnea in adults.