

QUESTION

A patient expired as he has accidentally suffered from an unknown gas poisoning. He had cherry red appearance of his blood at the post-mortem finding. Which of the following is the likely cause of his death?

A Hypoxic hypoxia

B Histotoxic hypoxia

C Anemic hypoxia

CORRECT

D Ischemic hypoxia

RIGHT ANSWER

OK C. Anemic hypoxia

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1a” here and does not include a written explanation for this item.

QUESTION

What physiological change causes the oxygen-hemoglobin dissociation curve to shift to the left?

A Increased temperature

B Increased 2,3-BPG

C Decreased pH

D Decreased CO_2

CORRECT

RIGHT ANSWER

OK

D. Decreased CO_2

WHY THIS IS RIGHT

A left shift of the oxyhemoglobin dissociation curve occurs with decreased CO_2 , reflecting reduced hydrogen ion concentration (alkalosis).

This increases hemoglobin's affinity for oxygen, favoring oxygen loading in the lungs. In contrast, increased temperature, increased 2,3-BPG, and decreased pH cause a right shift.

QUESTION

A 40-year-old male presented to OPD with complaints of excessive daytime sleepiness, and his wife also complains that he snores a lot at night during sleep. Which of the following is incorrect regarding his condition?

CORRECT

A Increased tone of the pharyngeal muscles worsens obstruction

B Fall of oxygen saturation triggers waking episodes at night

C Episodes of apnea increase stress on the heart

D Hypoxemia stimulates respiratory effort

RIGHT ANSWER

OK A. Increased tone of the pharyngeal muscles worsens obstruction

WHY THIS IS RIGHT

Clues:

- Excessive daytime sleepiness
- Loud snoring

Classic for Obstructive Sleep Apnea (OSA)

Sleep

↓
↓ Pharyngeal muscle tone
↓
Airway collapse
↓
Apnea (no airflow)
↓
↓ Oxygen saturation
↓
Arousal from sleep
↓
Cycle repeats

Feature	OSA Mechanism
Muscle tone	↓ (causes obstruction)
Oxygen level	↓ (hypoxemia)
Arousal	Triggered by hypoxia
Cardiac effect	↑ Stress (HTN, arrhythmia)
Respiratory drive	↑ due to hypoxemia

OSA Risk Factors

Factor	Effect
Obesity	↑ airway narrowing
Large neck circumference	↑ obstruction
Alcohol	↓ muscle tone
Sedatives	↓ muscle tone

Treatment	Role
CPAP	First-line
Weight loss	Essential
Surgery	Selected cases

QUESTION

A preterm baby who was delivered at 28 weeks developed respiratory distress syndrome. Which of the following is true about surface tension and compliance in this baby?

A Surface tension - decreased; Compliance - increased

B Surface tension - increased; Compliance - decreased

CORRECT

C Both surface tension and compliance decreased

D Both surface tension and compliance increased

RIGHT ANSWER

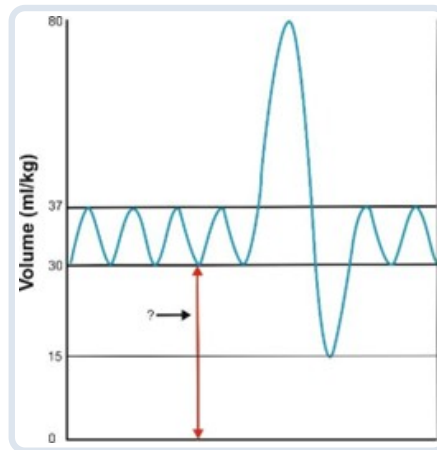
OK B. Surface tension - increased; Compliance - decreased

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

Identify the marked area in the given spirometry graph?



A Functional residual capacity

CORRECT

B Tidal volume

C Expiratory reserve volume

D Expiratory capacity

RIGHT ANSWER

OK

A. Functional residual capacity

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1c" here and does not include a written explanation for this item.

QUESTION

2, 3 BPG binds with which of the following?

- A Globin part of myoglobin
- B Globin part of hemoglobin**
- C Heme part of myoglobin
- D Heme part of hemoglobin

CORRECT

RIGHT ANSWER

- B. Globin part of hemoglobin**

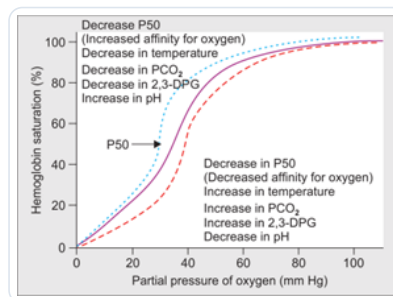
WHY THIS IS RIGHT

2,3-BPG binds to the globin chains of deoxyhemoglobin in the central cavity between the β -chains. This stabilizes the T (tense) state, reducing hemoglobin's affinity for oxygen and facilitating tissue oxygen delivery.

2,3-BPG produced in RBC glycolysis

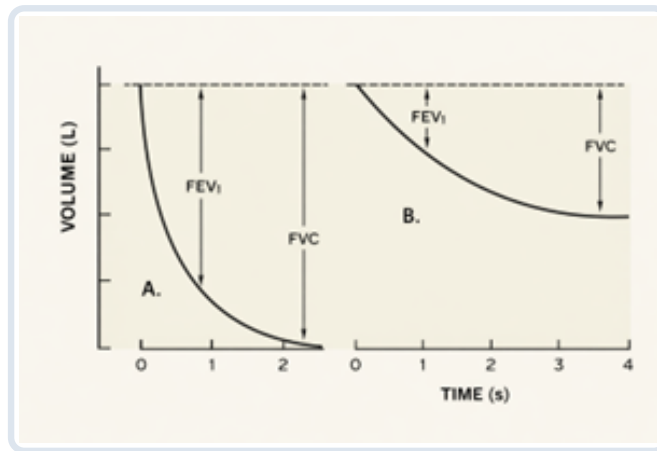
↓
Binds to deoxyhemoglobin (β -globin chains)
↓
Stabilizes T (tense) state of Hb
↓
↓ Affinity of Hb for O_2
↓
↑ Oxygen release to tissues
↓
Right shift of O_2 dissociation curve

It does not bind to the heme moiety or to myoglobin.



QUESTION

The graph given below shows the normal FEV₁ and FVC curves (A) for a normal lung and a diseased lung (B). The abnormal graph represents which of the following?



- A Bronchiectasis
- B Sarcoidosis
- C Pulmonary fibrosis

D COPD

CORRECT

RIGHT ANSWER

OK

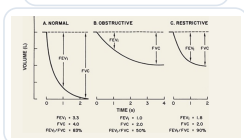
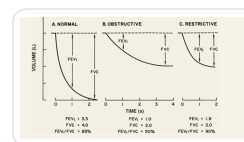
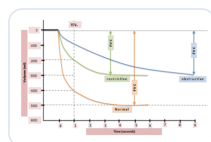
D. COPD

WHY THIS IS RIGHT

The abnormal curve shows reduced FEV₁ with a relatively preserved or less reduced FVC, causing a decreased FEV₁/FVC ratio, which is characteristic of obstructive lung disease.

There is a scooped-out expiratory limb due to airflow limitation and air trapping.

This pattern is typical of COPD, unlike restrictive diseases where both FEV₁ and FVC are proportionately reduced.



QUESTION

Peripheral chemoreceptors are most sensitive to which one of the following?

A CO₂

B Hypoxia

CORRECT

C Alkalosis

D Acidosis

RIGHT ANSWER

OK

B. Hypoxia

WHY THIS IS RIGHT

Located in:

- Carotid body (most important)
- Aortic body

They respond to:

- ↓ PaO₂ (primary stimulus)
- ↑ PaCO₂
- ↓ pH (acidosis)

Peripheral chemoreceptors in the carotid and aortic bodies are most sensitive to arterial hypoxemia (↓PaO₂), especially when PaO₂ falls below ~60 mmHg.

They respond rapidly to hypoxia and provide the primary ventilatory drive in low-oxygen states.

CO₂ and pH are mainly sensed by central chemoreceptors.

| Feature | Peripheral | Central |

| ----- | ----- | ----- |

| Location | Carotid & aortic bodies | Medulla |

| Primary stimulus | ↓ O₂ | ↑ CO₂ (via pH) |

| Speed | Rapid | Slower |

| Role in COPD | Important | Blunted |

QUESTION

Which one of the following is correct about physiological dead space?

- A It is less than anatomical dead space
- B It can be measured by spirometry
- C It is because of inadequate perfusion
- D It is because of inadequate ventilation

CORRECT

RIGHT ANSWER

- OK C. It is because of inadequate perfusion

WHY THIS IS RIGHT

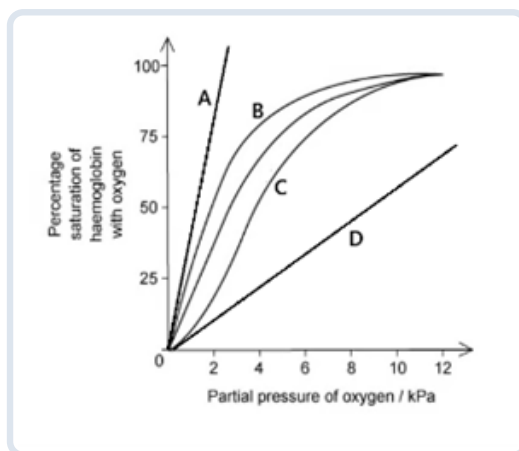
Type	Definition
Anatomical dead space	Conducting airways (no alveoli)
Alveolar dead space	Ventilated alveoli but no perfusion
Physiological dead space	Anatomical + alveolar dead space

Physiological dead space includes alveoli that are ventilated but not perfused, due to inadequate pulmonary blood flow. It equals anatomical dead space plus alveolar dead space and therefore is greater than or equal to anatomical dead space.
Spirometry measures volumes, not dead space, and inadequate ventilation cause shunt, not dead space.

Feature	Dead Space	Shunt
Ventilation	☐ Present	☐ Absent
Perfusion	☐ Absent	☐ Present
V/Q ratio	∞	0
Example	PE	Pneumonia

QUESTION

Which one of the following curves shows oxygen Hb dissociation after transfusion of stored blood?



A A

B B

CORRECT

C C

D D

RIGHT ANSWER

OK

B. B

WHY THIS IS RIGHT

When blood is stored:

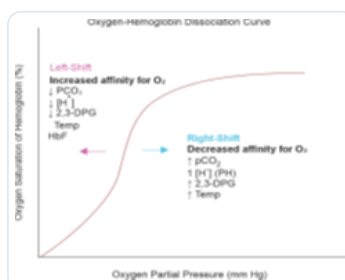
- 2,3-BPG levels fall (within days)
- RBC metabolism slows
- 2,3-BPG normally:
 - $\downarrow$ Hb affinity for O_2
 - Helps oxygen unloading in tissues

So when 2,3-BPG $\downarrow$:

- Hb holds onto O_2 tightly
- Less O_2 delivered to tissues
- Stored blood has reduced 2,3-DPG levels, which increases hemoglobin's affinity for oxygen.

This causes a left shift of the oxyhemoglobin dissociation curve, impairing oxygen release to tissues.

Curve B represents this moderate leftward shift seen after transfusion of stored blood.



QUESTION

A 42-year-old patient's pulmonary function test shows

FEV1/FVC = 0.62

FVC = 60%

RV/TLC = 142%

Which of the following best explains these findings?

A Restrictive

B Reduced compliance

C Air trapping

CORRECT

D Age-related

RIGHT ANSWER

OK
C. Air trapping

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1d" here and does not include a written explanation for this item.

QUESTION

During which phase is the surface tension in the alveoli at its highest?

A Inspiration

CORRECT

B Expiration

C Standing from supine position

D Goes from standing to supine position

RIGHT ANSWER

OK

A. Inspiration

WHY THIS IS RIGHT

Alveoli are lined by fluid -> this creates surface tension, which:

- Tends to collapse alveoli
- Is counteracted by surfactant

Laplace Law

Where:

- P = collapsing pressure
- T = surface tension
- r = radius of alveolus

Alveolus size changes during breathing

↓

Inspiration -> alveolus expands (↑ radius)

↓

Surfactant spreads -> ↓ surface tension

↓

Expiration -> alveolus shrinks (↓ radius)

↓

Surfactant molecules crowd together

↓

Surface tension tends to increase

Feature	Inspiration	Expiration
Alveolar size	↑	↓
Radius (r)	↑	↓
Surfactant spread	Diluted	Concentrated
Surface tension	↓	↑
Collapse tendency	Low	High

$$P = \frac{2T}{r}$$

QUESTION

In a case of myasthenia gravis, repetitive nerve stimulation shows a decremental response. What is the rationale explaining this?

CORRECT

- A** Reduced ACh receptors on the postsynaptic membrane
- B** Depletion of ACh in the presynaptic vesicles
- C** Decreased amplitude of action potential
- D** Autoantibodies blocking Calcium entry in the presynaptic terminal

RIGHT ANSWER

- OK** **A. Reduced ACh receptors on the postsynaptic membrane**

WHY THIS IS RIGHT

Myasthenia gravis is a postsynaptic disorder:

- Autoantibodies against:
- Nicotinic ACh receptors (Nm type)
- Result:
- ↓ number of functional receptors
- ↓ end-plate potential

Muscle fiber fails to reach threshold with repeated stimulation.

Feature	Myasthenia Gravis	Lambert-Eaton Syndrome
Site	Postsynaptic	Presynaptic
Antibody	ACh receptor	Voltage-gated Ca^{2+} channel
EMG response	□ Decremental	□ Incremental
Muscle strength	Worsens with use	Improves with use
Reflexes	Normal	Reduced
Association	Thymoma	Small cell lung cancer

QUESTION

A man is flying at an altitude of 3,400 meters and develops confusion, headache, and signs of cerebral edema. Which of the following mechanisms best explains the pathophysiology of high-altitude cerebral edema?

A Hypoxia causing cerebral vasodilation

CORRECT

B Metabolic acidosis leading to edema

C Hypoxia causing cerebral vasoconstriction

D High PCO₂ causing cerebral vasoconstriction

RIGHT ANSWER

OK

A. Hypoxia causing cerebral vasodilation

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1e” here and does not include a written explanation for this item.

QUESTION

In Decompression sickness, which one of the following is not seen?

- A** Hearing loss
- B** Hemodilution
- C** Thrombosis/Coagulopathy
- D** Visual disturbance

CORRECT

RIGHT ANSWER

B. Hemodilution

WHY THIS IS RIGHT

Decompression sickness results from nitrogen bubble formation causing vascular obstruction and endothelial injury. High pressure underwater

↓

↑ Nitrogen dissolved in tissues

↓

Rapid ascent

↓

↓ Pressure

↓

Nitrogen bubbles form

↓

Vascular obstruction + inflammation

↓

Ischemia + organ dysfunction

It produces neurologic deficits, hearing and visual disturbances, and can trigger thrombosis/coagulopathy due to intravascular bubble-induced activation.

Types of Decompression Sickness:

| Type | Feature |

| --- | ----- |

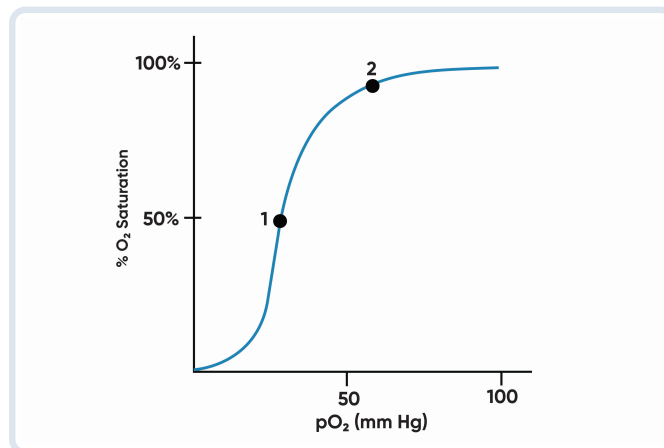
| Type I | Mild (joint pain, skin) |

| Type II | Severe (CNS, lungs, vestibular) |

Hemoconcentration, not hemodilution, is typically seen due to plasma leakage. Hence hemodilution is not a feature.

QUESTION

Physiologists studying hemoglobin function in patients with respiratory disorders are evaluating changes associated with oxygen loading and unloading. During the transition from point 1 to point 2 on the graph shown below, hemoglobin molecules are most likely to release which of the following?



A Chloride

B Oxygen

C Phosphate

D Protons

CORRECT

RIGHT ANSWER

OK

D. Protons

WHY THIS IS RIGHT

During oxygen loading in the lungs, hemoglobin binds O₂, which triggers the Haldane effect.

Mechanism:

- Oxygenation of hemoglobin reduces its affinity for hydrogen ions (H⁺) and CO₂.
- As a result, hemoglobin releases protons (H⁺) and CO₂ into the plasma.
- The released H⁺ combines with bicarbonate to form CO₂, which is then exhaled.

Key concept:

- Haldane effect: Oxygen binding promotes release of H⁺ and CO₂ from hemoglobin in the lungs.

QUESTION

A 19-year-old male soccer player undergoes an exercise tolerance test to measure his maximal Oxygen uptake during exercise. Which of the following changes are most likely to occur during exercise?

- A Increased pulmonary vascular resistance
- B Dead space ventilation
- C Decreased physiologic dead space**
- D Increased arterial partial pressure of oxygen

CORRECT

RIGHT ANSWER

OK

C. Decreased physiologic dead space

WHY THIS IS RIGHT

During exercise, pulmonary blood flow increases due to increased cardiac output. This leads to recruitment and distension of pulmonary capillaries, improving ventilation-perfusion (V/Q) matching.

Effects on dead space:

- More pulmonary capillaries are perfused
- Previously underperfused alveoli participate in gas exchange
- Physiologic dead space decreases

Other changes during exercise:

- Pulmonary vascular resistance decreases
- Minute ventilation increases
- PaO_2 remains relatively constant

QUESTION

A 16-year-old girl with a head injury from a car accident was brought to the emergency department by ambulance. On exam, she had a respiratory rate of 8 breaths per minute, and a prolonged duration of inhalation was noted. Damage to which of the following groups of neurons in the brainstem is most likely responsible for this abnormal respiration?

A Dorsal respiratory group

B Nucleus tractus solitarius

C Pneumotaxic center

CORRECT

D Vasomotor center

RIGHT ANSWER

OK C. Pneumotaxic center

WHY THIS IS RIGHT

The pneumotaxic center (located in the upper pons) regulates the duration of inspiration by sending inhibitory signals to the inspiratory neurons.

- Terminates inspiration
- Limits inspiratory time
- Helps regulate respiratory rate and pattern

Damage to the pneumotaxic center:

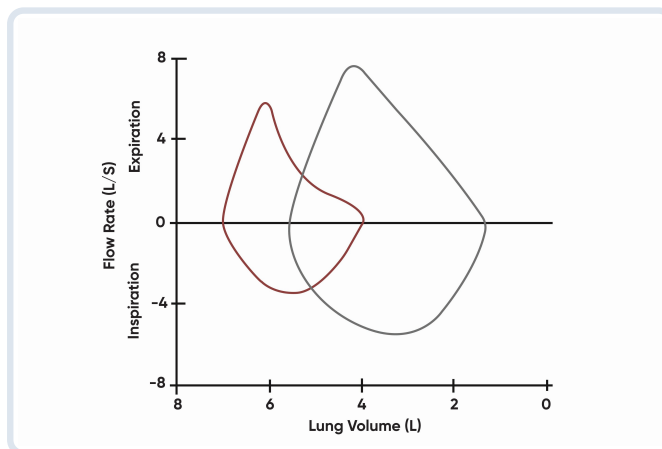
- Causes prolonged inspiration (apneustic breathing)
- Results in slow respiratory rate with deep, prolonged inhalation

Related centers:

- Dorsal respiratory group: controls basic inspiratory rhythm
- Vasomotor center: regulates blood pressure, not respiration.

QUESTION

A 57-year-old man is being evaluated for progressive shortness of breath. His respiratory flow-volume curve is shown in red below. Which of the following pathologic findings is most likely to be present in this patient?



A Alveolar hyaline membranes

B Compression atelectasis

C Interstitial wall destruction

CORRECT

D Intraalveolar hemorrhage

RIGHT ANSWER

OK

C. Interstitial wall destruction

WHY THIS IS RIGHT

The flow-volume loop shown demonstrates an obstructive pattern, characterized by:

- Reduced peak expiratory flow
- Scooped-out expiratory limb
- Increased lung volumes due to air trapping

This pattern is typical of emphysema, where destruction of interstitial walls leads to:

- Loss of elastic recoil
- Air trapping and hyperinflation
- Reduced expiratory airflow

Histopathology of emphysema:

- Destruction of alveolar septa
- Formation of enlarged air spaces
- Decreased surface area for gas exchange.

QUESTION

A 70-year-old woman has been enrolled in a longitudinal research study on aging for the last 30 years. Medical history is significant for osteoporosis; she has developed moderate kyphosis due to gradual loss of vertebral body height. She is otherwise active and healthy with no additional medical issues. She has never smoked. Compared to her physiology testing done years ago, which of the following changes is most consistent with normal aging in 1) lung compliance, 2) total respiratory system compliance and 3) physiologic dead space respectively?

CORRECT

A Increase, decrease, increase

B Increase, increase, increase

C Increase, unchanged, decrease

D Decrease, decrease, increase

RIGHT ANSWER

OK

A. Increase, decrease, increase

WHY THIS IS RIGHT

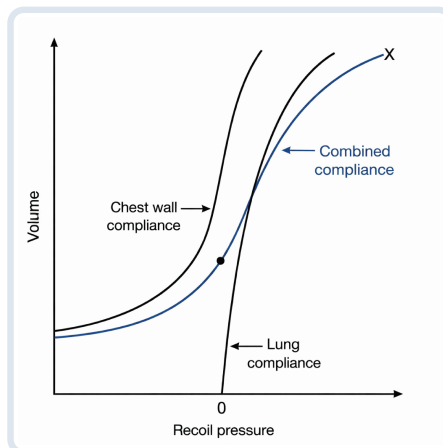
Normal aging causes several changes in respiratory mechanics due to loss of elastic recoil of the lungs and stiffening of the chest wall.

Key changes with aging:

- Lung compliance -> Increased
 - o Loss of elastic fibers makes lungs more distensible.
 - Total respiratory system compliance -> Decreased
- o Although lung compliance increases, chest wall compliance decreases due to calcification of costal cartilages, kyphosis, and osteoporosis, reducing overall compliance.
 - Physiologic dead space -> Increased
- o Due to ventilation-perfusion mismatch and decreased pulmonary capillary perfusion.

QUESTION

The combined compliance of the lung and chest wall of a healthy individual is measured and plotted as shown below. It is noted that the intrapleural pressure at the end of maximal inspiration is -8 cm H₂O (marked x). Which of the following is the best estimate of the intrapleural pressure at the point marked by the black dot?



A +10 cm H₂O

B + 5 cm H₂O

C -5cm H₂O

CORRECT

D 0cm H₂O

RIGHT ANSWER

OK C. -5cm H₂O

WHY THIS IS RIGHT

The combined compliance of the lung and chest wall determines the intrapleural pressure at different lung volumes.

- At functional residual capacity (FRC), the inward elastic recoil of the lungs equals the outward recoil of the chest wall.
- At this equilibrium point, the intrapleural pressure is approximately -5 cm H₂O.

During inspiration:

- Intrapleural pressure becomes more negative (e.g., about -8 cm H₂O at maximal inspiration).

During expiration toward FRC:

- Intrapleural pressure returns to about -5 cm H₂O.

QUESTION

Arrange the following in ascending order of their normal values

1. Vital capacity
2. FRC
3. Inspiratory capacity
4. Tidal Volume

A 1-2-3-4

B 1-4-2-3

C 4-3-1-2

D 4-2-3-1

CORRECT

RIGHT ANSWER

OK D. 4-2-3-1

WHY THIS IS RIGHT

Normal lung volumes and capacities can be arranged based on their approximate values in adults:

Parameter	Approximate Value
Tidal volume (TV)	~500 mL
Functional residual capacity (FRC)	~2300 mL
Inspiratory capacity (IC)	~1500 mL
Vital capacity (VC)	~4500-4800 mL

Thus, in ascending order:

Tidal volume < Functional residual capacity < Inspiratory capacity < Vital capacity

QUESTION

Hemoglobin is expected to become 100% saturated with oxygen when the partial pressure of oxygen (PO_2) reaches which of the following values?

A 75 mm Hg

B 90 mm Hg

C 100 mm Hg

CORRECT

D 120 mm Hg

RIGHT ANSWER

OK

C. 100 mm Hg

WHY THIS IS RIGHT

Hemoglobin oxygen saturation depends on the partial pressure of oxygen (PO_2) and follows a sigmoidal oxyhemoglobin dissociation curve.

- At $PO_2 \approx 100$ mm Hg (normal alveolar/arterial oxygen tension), hemoglobin is essentially fully saturated (~ 97 -100%).
- This plateau region ensures adequate oxygen loading in the lungs even with mild decreases in PO_2 .

Key reference points:

- $PO_2 \approx 100$ mm Hg $\rightarrow \sim 100\%$ saturation
- $PO_2 \approx 60$ mm Hg $\rightarrow \sim 90\%$ saturation (start of steep portion)
- $PO_2 \approx 40$ mm Hg $\rightarrow \sim 75\%$ saturation (typical venous blood)

QUESTION

The non-adrenergic, non-cholinergic (NANC) excitatory innervation of the tracheobronchial tree mediating bronchoconstriction is primarily due to the release of which neurotransmitter?

- A Nitric oxide
- B Vasoactive intestinal peptide (VIP)
- C Substance P**
- D Neuropeptide Y

CORRECT

RIGHT ANSWER

OK **C. Substance P**

WHY THIS IS RIGHT

The non-adrenergic, non-cholinergic (NANC) excitatory system in the airways mediates bronchoconstriction and increased mucus secretion.

Key neurotransmitter: Substance P

Actions of Substance P:

- Bronchoconstriction
- Increased mucus secretion
- Airway inflammation and vascular permeability

Contrast:

- Inhibitory NANC system releases nitric oxide (NO) and vasoactive intestinal peptide (VIP) -> bronchodilation.

QUESTION

During strenuous exercise, ventilation remains elevated for a short period even after cessation of exercise. This persistence of increased ventilation is best explained by the overdrive mechanism mediated primarily by which of the following?

- A** Dorsal respiratory group activation by peripheral chemoreceptors
- B** Ventral respiratory group-mediated recruitment of expiratory muscles CORRECT
- C** Pneumotaxic center-mediated shortening of inspiratory time
- D** Hering-Breuer inflation reflex

RIGHT ANSWER

- OK** **B. Ventral respiratory group-mediated recruitment of expiratory muscles**

WHY THIS IS RIGHT

During strenuous exercise, ventilation increases due to activation of the ventral respiratory group (VRG) in the medulla.

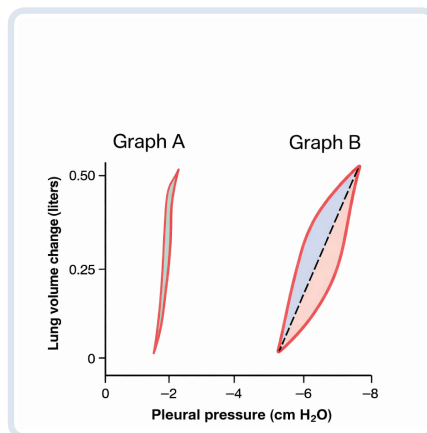
Mechanism:

- The VRG becomes active during forced breathing.
- It recruits accessory inspiratory muscles and expiratory muscles (e.g., abdominal muscles, internal intercostals).
- This produces active expiration and increased ventilation.

Even after exercise stops, the central respiratory drive (overdrive) may persist briefly, maintaining elevated ventilation.

QUESTION

A physiologist compares the pressure-volume curves of air-filled lungs and saline-filled lungs. Lung volume is plotted on the Y-axis and alveolar pressure on the X-axis. Which of the following physiological principles best explains the changes seen in Graph A as compared to Graph B?



A Frank-Starling law

B Poiseuille's law

C Bell-Magendie law

D Laplace's law

CORRECT

RIGHT ANSWER

OK D. Laplace's law

WHY THIS IS RIGHT

The difference between air-filled lungs and saline-filled lungs on the pressure-volume curve is explained by surface tension at the air-liquid interface in alveoli, described by Laplace's law.

- P = collapsing pressure
- T = surface tension
- r = radius of alveolus

Key concepts:

- In air-filled lungs, surface tension from the air-fluid interface increases collapsing pressure -> lower compliance and hysteresis.
- In saline-filled lungs, there is no air-liquid interface, so surface tension is minimal -> higher compliance and minimal hysteresis.

Role of surfactant:

- Produced by type II pneumocytes
- Reduces surface tension, preventing alveolar collapse.

Laplace's law:

$$P = \frac{2T}{r}$$

QUESTION

A healthy adult reaches a steady state while exercising on a treadmill. His oxygen consumption during exercise is measured as 1500 mL/min, while his resting oxygen consumption is 250 mL/min. What is the metabolic equivalent (MET) level of this activity?

A 5

B 6

CORRECT

C 1/5

D 1/6

RIGHT ANSWER

OK

B. 6

WHY THIS IS RIGHT

A Metabolic Equivalent (MET) represents the energy expenditure of an activity relative to resting metabolic rate.

- 1 MET = oxygen consumption at rest ≈ 3.5 mL O₂/kg/min
- It is commonly approximated as ~ 250 mL O₂/min in an average adult.

Calculation:

$$MET = \frac{\text{O consumption during activity}}{\text{O consumption at rest}}$$

$$MET = \frac{1500}{250} = 6$$

QUESTION

Hypoxia causes vasodilatation in systemic arteries, unlike vasoconstriction in pulmonary arteries, because:

- A** Systemic arteries have O₂-sensitive K⁺ channels
- B** Systemic arteries have ATP-sensitive K⁺ channels CORRECT
- C** Systemic arteries have Ca²⁺ channels
- D** Systemic arteries have free pore K⁺ channels

RIGHT ANSWER

- B. Systemic arteries have ATP-sensitive K⁺ channels**

WHY THIS IS RIGHT

Hypoxia causes vasodilation in systemic circulation because systemic vascular smooth muscle contains ATP-sensitive K⁺ (K_{ATP}) channels.

- Hypoxia -> ↓ intracellular ATP
- Opens ATP-sensitive K⁺ channels
- K⁺ efflux -> membrane hyperpolarization
- Closure of voltage-gated Ca²⁺ channels
- ↓ Ca²⁺ influx -> vascular smooth muscle relaxation -> vasodilation

Contrast:

In the pulmonary circulation, hypoxia causes vasoconstriction (hypoxic pulmonary vasoconstriction) to redirect blood toward better-ventilated lung regions.

QUESTION

A preterm neonate on mechanical ventilation develops termination of inspiration when the lungs are inflated beyond a certain volume. The response is mediated via the vagus nerve and is abolished after bilateral vagotomy. Which of the following receptors is primarily responsible for this response?

- A Rapidly adapting pulmonary receptors
- B J (juxtacapillary) receptors
- C Slowly adapting pulmonary stretch receptors**
- D Peripheral chemoreceptors

CORRECT

RIGHT ANSWER

- OK
- C. Slowly adapting pulmonary stretch receptors**

WHY THIS IS RIGHT

The Hering-Breuer inflation reflex prevents overdistension of the lungs during inspiration.

- Lung inflation activates slowly adapting pulmonary stretch receptors located in the bronchial smooth muscle.
- These receptors send signals through the vagus nerve to the medullary respiratory centers.
- This terminates inspiration and prolongs expiration, protecting the lungs from overinflation.

QUESTION

A 56-year-old man was diagnosed with COVID-19 and was put on mechanical ventilation. He passed away after a week. What is the likely post-mortem change seen in the lungs?

- A** Thick layer of fibrin lining the alveoli
- B** Acute and chronic alveolar hemorrhage
- C** Perivascular cuffing
- D** Pulmonary artery hypertrophy with increased resistance

CORRECT

RIGHT ANSWER

- OK**
- A. Thick layer of fibrin lining the alveoli**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$19” here and does not include a written explanation for this item.

QUESTION

A 14-year-old boy is brought to the emergency department for follow-up after experiencing a near-drowning incident that led to ARDS. He was mechanically ventilated for 2 weeks and subsequently discharged. The patient now reports persistent exertional dyspnea and mild fatigue. Which of the following parameters is most likely increased compared to a child with normal cardiopulmonary function?

A Alveolar-arterial oxygen difference

CORRECT

B Diffusion capacity of the lung

C Forced expiratory volume (FEV1)

D Left ventricular end-diastolic pressure

RIGHT ANSWER

OK **A. Alveolar-arterial oxygen difference**

WHY THIS IS RIGHT

Acute respiratory distress syndrome (ARDS) causes diffuse alveolar damage and thickening of the alveolar-capillary membrane, impairing gas exchange.

- Impaired oxygen diffusion and V/Q mismatch
- Leads to an increased alveolar-arterial (A-a) oxygen gradient

Other expected findings after ARDS:

- Reduced diffusion capacity (DLCO)
- Restrictive lung pattern on pulmonary function tests

Important point:

An increased A-a gradient indicates impaired oxygen transfer from alveoli to blood, seen in conditions like ARDS, pneumonia, pulmonary fibrosis, and V/Q mismatch.

QUESTION

A 14-year-old boy is brought to the emergency department for follow-up after experiencing a near-drowning incident that led to ARDS. He was mechanically ventilated for 2 weeks and subsequently discharged. The patient now reports persistent exertional dyspnea and mild fatigue. Which of the following parameters is most likely increased compared to a child with normal cardiopulmonary function?

A Alveolar-arterial oxygen difference

CORRECT

B Diffusion capacity of the lung

C Forced expiratory volume (FEV1)

D Left ventricular end-diastolic pressure

RIGHT ANSWER

OK **A. Alveolar-arterial oxygen difference**

WHY THIS IS RIGHT

Acute respiratory distress syndrome (ARDS) causes diffuse alveolar damage and thickening of the alveolar-capillary membrane, impairing gas exchange.

- Impaired oxygen diffusion and V/Q mismatch
- Leads to an increased alveolar-arterial (A-a) oxygen gradient

Other expected findings after ARDS:

- Reduced diffusion capacity (DLCO)
- Restrictive lung pattern on pulmonary function tests

Important point:

An increased A-a gradient indicates impaired oxygen transfer from alveoli to blood, seen in conditions like ARDS, pneumonia, pulmonary fibrosis, and V/Q mismatch.

QUESTION

A 1-hour-old boy born at 29 weeks gestation via cesarean delivery due to maternal preeclampsia with severe features, is admitted to the neonatal intensive care unit for respiratory failure. Which of the following best describes the condition of this patient's lungs compared to a normal neonate?

- A** Compliance low, FRC high, Airway resistance high
- B** Compliance low, FRC low, Airway resistance high
- C** Compliance high, FRC high, Airway resistance high
- D** Compliance high, FRC high, Airway resistance low

CORRECT

RIGHT ANSWER

- OK** **B. Compliance low, FRC low, Airway resistance high**

WHY THIS IS RIGHT

A preterm neonate (29 weeks) is at high risk for neonatal respiratory distress syndrome (NRDS) due to surfactant deficiency from immature type II pneumocytes.

Physiologic consequences:

- ↓ Lung compliance → stiff lungs that are difficult to expand
- ↓ Functional residual capacity (FRC) → alveolar collapse (atelectasis)
- ↑ Airway resistance due to poorly expanded lungs

Pathology:

- Formation of hyaline membranes in alveoli
- Diffuse atelectasis

Management:

- Exogenous surfactant therapy
- Continuous positive airway pressure (CPAP)
- Antenatal corticosteroids to accelerate lung maturation.

QUESTION

A 63-year-old woman is brought to the emergency department because of a 2-day history of severe epigastric pain and nausea. She has a 20-year history of alcohol use disorder. Nine hours after admission, she becomes increasingly dyspneic and tachypneic. Pulse oximetry on supplemental oxygen shows an oxygen saturation of 81%. Physical examination shows diffuse lung crackles, marked epigastric tenderness, and a periumbilical hematoma. Laboratory studies show normal brain natriuretic peptide. An x-ray of the chest shows bilateral opacities in the lower lung fields. Which of the following pathomechanisms best explains this patient's pulmonary findings?

- A** Alveolocapillary membrane leakage CORRECT
- B** Intrapulmonary left-to-right shunt
- C** Increased production of surfactant
- D** Embolic obstruction of pulmonary arteries

RIGHT ANSWER

- OK** **A. Alveolocapillary membrane leakage**

WHY THIS IS RIGHT

This patient with severe epigastric pain, alcohol use, and periumbilical ecchymosis (Cullen sign) likely has acute pancreatitis complicated by acute respiratory distress syndrome (ARDS).

Pathophysiology of ARDS:

- Systemic inflammation -> damage to the alveolar-capillary membrane
- Leads to increased permeability and leakage of protein-rich fluid into alveoli
- Causes noncardiogenic pulmonary edema, diffuse crackles, and bilateral infiltrates on chest X-ray.

Key features:

- Severe hypoxemia refractory to oxygen
- Normal BNP (distinguishes from cardiogenic pulmonary edema)
- Diffuse bilateral lung opacities

QUESTION

55-year-old woman with a history of Crohn disease is admitted to the hospital due to perforated appendicitis. The patient quickly develops respiratory difficulty, and acute respiratory distress syndrome is diagnosed. She is intubated and mechanically ventilated with positive pressure ventilation. She is intermittently placed in the prone position while mechanically ventilated. Which of the following is most likely to occur due to this position change?

- A** Alveolar hyperdistention
- B** Decreased cardiac output
- C** Decreased functional residual capacity

D Decreased physiological shunting

CORRECT

RIGHT ANSWER

OK D. Decreased physiological shunting

WHY THIS IS RIGHT

In acute respiratory distress syndrome (ARDS), many dependent (posterior) lung regions collapse, leading to ventilation-perfusion mismatch and physiological shunting.

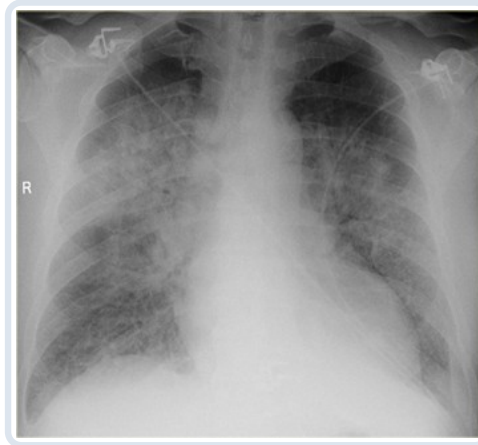
Prone positioning during mechanical ventilation:

- Improves ventilation of posterior lung regions
- Redistributes perfusion and ventilation more evenly
- Recruits collapsed alveoli
- Improves oxygenation

As a result, physiological shunting decreases because more alveoli become ventilated and able to participate in gas exchange.

QUESTION

A hypertensive patient who is non-compliant with medication presents to you with sudden onset breathlessness. A chest X-ray was done, which is shown below. How will you manage this patient?



- A** Intravenous salbutamol
- B** Intravenous nitroglycerin
- C** Nebulization with salbutamol
- D** Oxygen and antibiotics

CORRECT

RIGHT ANSWER

- OK** **B. Intravenous nitroglycerin**

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1a" here and does not include a written explanation for this item.

QUESTION

A 44-year-old male presented with cough. Chest X-ray revealed pleural effusion. Thoracentesis was done, and the following was observed. Pleural fluid protein to serum protein ratio was 0.6. Which of the following is the likely diagnosis?

- A Cirrhosis
- B Congestive heart failure
- C Pleural TB
- D Nephrotic Syndrome

CORRECT

RIGHT ANSWER

OK
C. Pleural TB

WHY THIS IS RIGHT

A pleural fluid protein-to-serum protein ratio of 0.6 fulfills Light's criteria for an exudative effusion.

Tuberculous pleural effusion is classically exudative, with high protein content due to increased capillary permeability.

Cirrhosis, CHF, and nephrotic syndrome cause transudative effusions with low protein ratios.

Feature	Exudate	Transudate
Protein ratio	>0.5	<0.5
LDH	High	Low
Cause	Inflammation	Pressure imbalance
Example	TB, malignancy	CHF, cirrhosis

QUESTION

A 44-year-old female who is a known case of scleroderma presented with shortness of breath, especially during exercise. She underwent right heart catheterization, and her mean pulmonary artery pressure (mPAP) was 35 mm Hg. Which of the following is true regarding her condition?

- A** CCBs are the first line in all patients
- B** Endothelin antagonists improve symptoms
- C** Lung transplant is the best treatment if identified early
- D** Lifestyle modification

CORRECT

RIGHT ANSWER

- B. Endothelin antagonists improve symptoms**

WHY THIS IS RIGHT

Scleroderma with mPAP ≥ 25 mmHg indicates pulmonary arterial hypertension (PAH).

Endothelin receptor antagonists (e.g., bosentan, ambrisentan) reduce pulmonary vascular resistance and improve symptoms and exercise capacity.

| Option | Statement | When it is Correct | Why NOT Correct Here | Exam Pearl |

| ---- | - | - | - | - |

| A. CCBs are first line in all patients | Vasodilators | Only in vasoreactive patients | ☐ Not for all PAH patients | Do vasoreactivity testing first |

| B. Endothelin antagonists improve symptoms | ☐ Block vasoconstriction | ☐ PAH (especially CTD-related) | ☐ Correct | First-line targeted therapy |

| C. Lung transplant is best early | Surgical option | End-stage disease | ☐ Not first-line | Reserved for refractory cases |

| D. Lifestyle modification | Supportive care | Mild disease adjunct | ☐ Not definitive therapy | Only supportive |

QUESTION

A 53-year-old male patient who is a known case of COPD developed breathlessness and is on mechanical ventilation. He suddenly developed hypoxia, and on examination, he has reduced/absent breath sounds on the left hemithorax with increased peak inspiratory pressure. What is the likely diagnosis?

A Acute Exacerbation

B Pulmonary Embolism

C Pneumothorax

CORRECT

D Pneumonia

RIGHT ANSWER

OK C. Pneumothorax

WHY THIS IS RIGHT

Sudden hypoxia in a ventilated COPD patient with absent breath sounds on one side and increased peak inspiratory pressures is classic for acute pneumothorax, often tension pneumothorax.

COPD patients have fragile bullae that can rupture, especially under positive pressure ventilation.

Mechanical ventilation (positive pressure)

↓
Alveolar overdistension
↓
Alveolar rupture
↓
Air leaks into pleural space
↓
Lung collapse
↓
Breath sounds + ↑ airway pressure
↓
Sudden hypoxia

Pulmonary embolism does not cause unilateral absent breath sounds or raised airway pressures.

Finding	Likely Diagnosis
↑ Peak pressure + absent breath sounds	Pneumothorax
↑ Peak pressure + wheeze	Bronchospasm
Normal breath sounds + hypoxia	Pulmonary embolism
Fever + crackles	Pneumonia

QUESTION

A 43-year-old male presented with right-sided rib pain and shortness of breath. A chest X-ray showed a significant right-sided pneumothorax with cardio-mediastinal shift to the left. Which of the following changes will be seen?

- A** Increased lung volume, Increased thoracic volume
- B** Decreased lung volume, Increased thoracic volume
- C** Decreased lung volume, thoracic volume remains unaffected
- D** Lung volume remains unaffected, Decreased thoracic volume

CORRECT

RIGHT ANSWER

- OK** **B. Decreased lung volume, Increased thoracic volume**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

A patient who had undergone knee replacement surgery 7 days back, now presents with complaints of sudden shortness of breath and tachycardia. What is the next appropriate diagnostic test?

- A** D Dimer
- B** Chest X-ray
- C** CT pulmonary angiography
- D** Ventilation/Perfusion scan

CORRECT

RIGHT ANSWER

- OK** C. CT pulmonary angiography

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1c” here and does not include a written explanation for this item.

QUESTION

| Inhaled NO is used in:

A Primary Pulmonary Artery Hypertension

CORRECT

B Obstructive Sleep Apnea

C Unstable Angina

D Erectile Dysfunction

RIGHT ANSWER

OK A. Primary Pulmonary Artery Hypertension

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

A patient is diagnosed with pulmonary arterial hypertension (PAH). Which of the following drugs used in this condition act as prostacyclin receptor agonists?

1. Epoprostenol
2. Iloprost
3. Ambrisentan
4. Selexipag

A 1 and 2

B 1, 2, and 4

CORRECT

C 2, 3, and 4

D 1, 3, and 4

RIGHT ANSWER

OK

B. 1, 2, and 4

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1e” here and does not include a written explanation for this item.

QUESTION

Indications of chest drain in a parapneumonic effusion are all except:

- A Loculated pleural fluid
- B Pleural fluid pH < 7.2
- C Pleural fluid glucose < 60 mg/dL
- D Pleural fluid LDH > 1000**

CORRECT

RIGHT ANSWER

- OK
- D. Pleural fluid LDH > 1000**

WHY THIS IS RIGHT

In parapneumonic effusion, a chest tube (tube thoracostomy) is indicated when the effusion is complicated or progressing toward empyema.

Indications for chest drain include:

- Loculated pleural fluid
- Pleural fluid pH < 7.2
- Pleural fluid glucose < 60 mg/dL
- Positive Gram stain or culture
- Frank pus in pleural space

Although pleural fluid LDH may be elevated, LDH >1000 alone is not an indication for chest tube drainage.

QUESTION

A 54-year-old man comes to the OPD due to daytime sleepiness and lack of energy. The symptoms began 6 months ago and have progressively worsened so that he feels "completely drained" by the end of the day. The patient's wife mentions that he snores loudly. The patient does not use tobacco or alcohol, and he works in the warehouse of an agricultural supply company. BMI is 34 kg/m². Physical examination shows a narrow oropharynx and a large neck circumference. The patient is at increased risk of developing which of the following?

- A** Bronchiectasis
- B** Hypertrophic cardiomyopathy
- C** Hypertension
- D** Pulmonary hypertension

CORRECT

RIGHT ANSWER

- OK** **D. Pulmonary hypertension**

WHY THIS IS RIGHT

This patient has features of obstructive sleep apnea (OSA): obesity, loud snoring, daytime sleepiness, large neck circumference, and narrow oropharynx.

- Repeated upper airway obstruction during sleep
- Causes intermittent hypoxia and hypercapnia
- Leads to hypoxic pulmonary vasoconstriction

Long-term consequence:

- Pulmonary hypertension
- May progress to cor pulmonale (right heart failure).

Other complications of OSA:

- Systemic hypertension
- Arrhythmias
- Stroke
- Insulin resistance.

QUESTION

Which of the following diseases/ pathogens are associated with pulmonary renal syndromes?

1. Goodpasture syndrome
2. Leptospirosis
3. Wegener's granulomatosis
4. Hanta virus

A 1,2,3,4

CORRECT

B 1,2,4

C 1,3,4

D 2,4

RIGHT ANSWER

OK
A. 1,2,3,4

WHY THIS IS RIGHT

Pulmonary-renal syndrome refers to the combination of diffuse alveolar hemorrhage and rapidly progressive glomerulonephritis.

Common causes include:

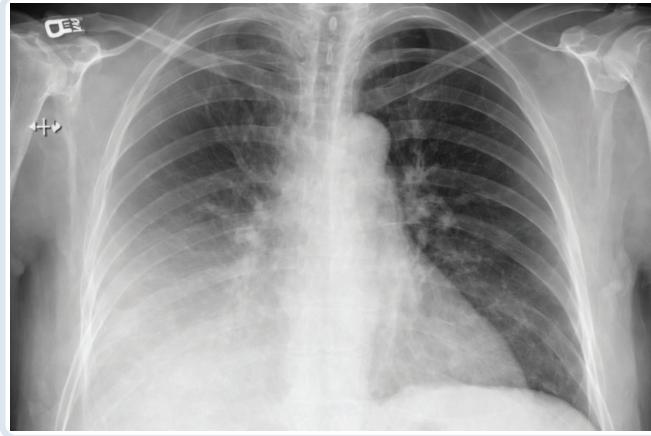
- Goodpasture syndrome -> anti-GBM antibodies affecting lungs and kidneys
- Granulomatosis with polyangiitis (Wegener's) -> ANCA-associated vasculitis
- Leptospirosis -> severe infection (Weil disease) causing pulmonary hemorrhage and renal failure
- Hantavirus infection -> can cause pulmonary hemorrhage with renal involvement

Clinical manifestations:

- Hemoptysis
- Dyspnea due to alveolar hemorrhage
- Hematuria and rapidly progressive glomerulonephritis

QUESTION

A 66-year-old man comes to the office due to increasing shortness of breath over the past 3 weeks. He has had a nonproductive cough for several months, which he attributes to allergies, but also notes a 9-kg unintentional weight loss over this time. He has a 50-pack-year smoking history. Chest x-ray is shown below. Which of the following would be the expected physical examination finding over the right lower chest?



- A Bronchial breath sounds
- B Decreased tactile fremitus
- C Fine inspiratory crackles
- D Increased resonance on percussion

CORRECT

RIGHT ANSWER

- OK
- B. Decreased tactile fremitus**

WHY THIS IS RIGHT

A pleural effusion causes accumulation of fluid in the pleural space, which impairs transmission of sound vibrations from the lung to the chest wall.

Physical examination findings in pleural effusion:

- ↓ Tactile fremitus
- Dullness to percussion
- Decreased or absent breath sounds
- Reduced chest expansion

Pleural fluid dampens sound transmission, leading to decreased tactile fremitus, unlike lung consolidation where fremitus is increased.

QUESTION

A 64-year-old man comes to the OPD due to worsening dyspnea on exertion for the past 3 months. The patient has had a nonproductive cough but no chest pain, fever, or chills. He was diagnosed with hypertension several years ago but takes no medications. Physical examination shows bilateral inspiratory crackles as well as dullness to percussion and decreased breath sounds at the right lung base. Chest x-ray reveals a right-sided pleural effusion. Which of the following pleuropulmonary changes are most likely present in this patient?

- A** Vascular hydrostatic pressure increased, Oncotic pressure increased, lymphatic flow normal
- B** Vascular hydrostatic pressure normal, Oncotic pressure normal, lymphatic flow decreased
- C** Vascular hydrostatic pressure increased, Oncotic pressure normal, lymphatic flow increased **CORRECT**
- D** Vascular hydrostatic pressure normal, Oncotic pressure decreased, lymphatic flow increased

RIGHT ANSWER

- OK** **C. Vascular hydrostatic pressure increased, Oncotic pressure normal, lymphatic flow increased**

WHY THIS IS RIGHT

Pleural effusion due to congestive heart failure occurs from increased pulmonary capillary hydrostatic pressure.

- Elevated hydrostatic pressure in pulmonary capillaries -> transudation of fluid into the pleural space
- Oncotic pressure remains normal
- Lymphatic drainage increases initially to compensate but may eventually be overwhelmed.

Characteristics:

- Produces a transudative pleural effusion
- Commonly seen in heart failure

QUESTION

A 45-year-old female patient with class II pulmonary hypertension presents with a positive vasoreactivity test. Which of the following is used in the next step of management?

- A Iloprost
- B Ambrisentan
- C Nifedipine**
- D Epoprostenol

CORRECT

RIGHT ANSWER

OK
C. Nifedipine

WHY THIS IS RIGHT

In pulmonary arterial hypertension (PAH), a vasoreactivity test is performed during right heart catheterization using agents such as inhaled nitric oxide, epoprostenol, or adenosine.

- If the vasoreactivity test is positive, the next step is treatment with high-dose calcium channel blockers (CCBs) such as nifedipine, diltiazem, or amlodipine.
- These drugs cause pulmonary vasodilation and reduce pulmonary arterial pressure.

Other drugs (e.g., endothelin receptor antagonists, prostacyclin analogs) are used when vasoreactivity testing is negative or when patients do not respond to CCBs.

QUESTION

A 53-year-old woman is brought to the emergency department after she collapsed suddenly while standing. She also reports left-sided chest pain. The patient was recently diagnosed with colon cancer on a routine colonoscopy and has been on bed rest since then. Her blood pressure is 86/50 mm Hg and pulse is 120/min and regular. Pulse oximetry shows 80% on room air. She is diaphoretic and tachypneic. Jugular venous pressure is 13 cm HO. Further workup in this patient would most likely show which of the following?

A Cannon a waves on JVP

B Raised troponin levels

C Mediastinal widening

D Filling defect in PA on CTPA

CORRECT

RIGHT ANSWER

OK

D. Filling defect in PA on CTPA

WHY THIS IS RIGHT

Pulmonary embolism (PE) commonly presents with sudden dyspnea, pleuritic chest pain, syncope, hypotension, tachycardia, and hypoxemia, especially in patients with risk factors for venous thromboembolism such as malignancy, prolonged immobilization, or recent surgery.

- Causes acute increase in pulmonary vascular resistance
- Leads to right ventricular strain and elevated JVP

Diagnostic test of choice in hemodynamically stable patients: CT pulmonary angiography (CTPA), which shows a filling defect in the pulmonary artery due to an intraluminal thrombus.

Why other options are incorrect:

- A. Cannon a waves on JVP: Seen in AV dissociation (e.g., complete heart block, ventricular tachycardia), not pulmonary embolism.
- B. Raised troponin levels: May occur with myocardial infarction; mild elevation can occur in PE due to RV strain but it is not the key diagnostic finding.
- C. Mediastinal widening: Suggests aortic dissection.

QUESTION

A 60-year-old obese gentleman presents to the emergency department with acute onset of breathlessness. He is a known case of type 2 diabetes mellitus for 10-12 years with poor drug compliance. He has a 40 pack-year smoking history. He was diagnosed with a chronic respiratory illness and started on bronchodilator inhalation 10 years ago but has had no regular follow-up. He gives a history of progressively worsening exertional dyspnea for the past 6 months. What is the next best step?

A Electrocardiogram (ECG)

B Echocardiography

C Pro-B-type natriuretic peptide (Pro-BNP)

CORRECT

D Troponin T

RIGHT ANSWER

OK C. Pro-B-type natriuretic peptide (Pro-BNP)

WHY THIS IS RIGHT

In patients with acute dyspnea, especially with risk factors for heart failure (obesity, diabetes, smoking), measuring B-type natriuretic peptide (BNP) or NT-proBNP helps differentiate cardiac from pulmonary causes of breathlessness.

- BNP is released from ventricular myocardium in response to increased wall stretch and pressure overload.

Clinical utility:

- High BNP/NT-proBNP -> suggests heart failure
- Low BNP -> makes heart failure unlikely

BNP testing is often used as an initial screening test in the emergency department before further imaging like echocardiography.

QUESTION

A 46-year-old woman presents to the emergency department with sudden onset dyspnea, pleuritic chest pain, and syncope. She has tachycardia, hypotension, and raised JVP. ECG shows sinus tachycardia with T-wave inversions in V1-V4. Bedside transthoracic echocardiography reveals akinesia of the mid-free wall of the right ventricle with preserved apical contractility. This echocardiographic finding is most classically associated with which of the following conditions?

- A** Right ventricular myocardial infarction
- B** Acute pulmonary embolism
- C** Chronic pulmonary hypertension
- D** Arrhythmogenic right ventricular cardiomyopathy

CORRECT

RIGHT ANSWER

- B. Acute pulmonary embolism**

WHY THIS IS RIGHT

McConnell sign is an echocardiographic finding characterized by akinesia of the mid-free wall of the right ventricle with preserved apical contractility.

It is classically associated with acute pulmonary embolism (PE).

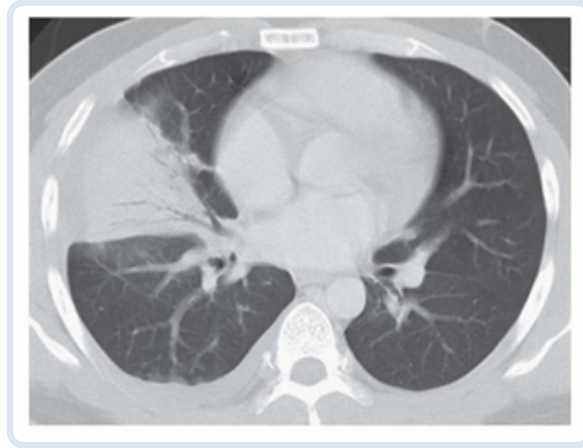
- Acute PE causes sudden increase in pulmonary vascular resistance
- Leads to acute right ventricular pressure overload
- Results in regional RV wall motion abnormality (McConnell sign)

Clinical clues suggesting PE:

- Sudden dyspnea, pleuritic chest pain, syncope
- Tachycardia, hypotension, elevated JVP
- ECG may show sinus tachycardia and right heart strain (T-wave inversion V1-V4).

QUESTION

A 35-year-old female patient presents to you with fever, breathlessness, and cough with expectoration. A CT scan was done which is shown below. What is the most likely diagnosis?



A Consolidation

CORRECT

B Mass

C Pleural effusion

D Diaphragmatic hernia

RIGHT ANSWER

OK

A. Consolidation

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$19" here and does not include a written explanation for this item.

QUESTION

A 45-year-old male presented with fever of 102°F with foul-smelling sputum for 5 days. On examination, clubbing was noted in the digits. Chest X-ray is shown below. What is the most likely diagnosis?

A Pneumatocele

B Empyema

C Pneumothorax

D Lung abscess

CORRECT

RIGHT ANSWER

OK
D. Lung abscess

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1a” here and does not include a written explanation for this item.

QUESTION

A 65-year-old male presented with fever, cough, and chest pain. Identify the lesion in the given Chest X-ray.

A Right upper lobe consolidation

CORRECT

B Right lung collapse

C Right upper lobe malignancy

D Right upper lobe abscess

RIGHT ANSWER

OK

A. Right upper lobe consolidation

WHY THIS IS RIGHT

The chest X-ray shows homogeneous opacity in the right upper zone with preserved lung volume, consistent with lobar consolidation.

- Dense white opacity
- Preserved lung volume
- Air bronchograms

Acute symptoms of fever, cough, and pleuritic chest pain support an infective etiology.

Collapse would show volume loss with mediastinal shift, abscess shows cavitation with air-fluid level, and malignancy presents as a mass lesion.

Feature	Consolidation	Collapse	Abscess	Malignancy
Onset	Acute	Acute/subacute	Subacute	Chronic
Opacity	Homogeneous	Dense + volume loss	Cavity	Mass
Air bronchogram	☒ Present	☐ Absent	☐ Absent	Rare
Mediastinal shift	No	Toward lesion	No	Variable

QUESTION

A 65-year-old man was brought after a fall. He has a fever and confusion. On examination, he had a cough with rales. The patient was also tachypneic. How will you manage this patient?



- A** Admit and give IV levofloxacin
- B** Treat at home with oral Amoxicillin
- C** Admit and give IV ceftriaxone
- D** Admit and give IV ceftriaxone and IV levofloxacin

CORRECT

RIGHT ANSWER

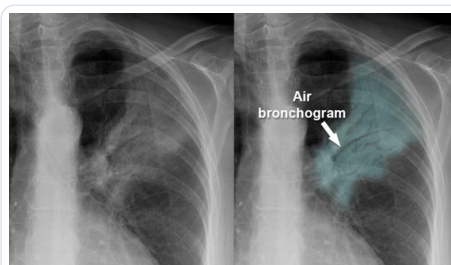
- OK** **D. Admit and give IV ceftriaxone and IV levofloxacin**

WHY THIS IS RIGHT

Apply CURB-65 Score:

Parameter	Present?
Confusion	☐
Urea >7	?
RR ≥30	Likely ☐
BP low	Not given
Age ≥65	☐

An elderly patient with fever, confusion, tachypnea, and rales indicates severe community-acquired pneumonia requiring hospital admission. Severe CAP warrants dual therapy with a β -lactam (ceftriaxone) plus a respiratory fluoroquinolone (levofloxacin) for broad coverage. Score ≥ 2 $\rightarrow$ Hospital admission required
Severe CAP $\rightarrow$ Broad-spectrum IV combination therapy



QUESTION

A 30-year-old patient presents with fever, cough, and tenacious white sputum. Which of the following should be used for treatment?

A Syrup Dextromethorphan with bromhexine

B Syrup Codeine

C Syrup Dextromethorphan

D Syrup Bromhexine

CORRECT

RIGHT ANSWER

OK D. Syrup Bromhexine

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

A 46-year-old diabetic presented with fever, malaise, and cough. His chest X-ray is shown. Which of the following is correct?



- A** Lobar infiltrates - Pyogenic pneumonia
- B** Hilar infiltrates - Malignancy
- C** Interstitial infiltrates - Mycoplasma
- D** Aspiration pneumonia - Upper segment of right lower lobe

CORRECT

RIGHT ANSWER

- OK** C. Interstitial infiltrates - Mycoplasma

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1c" here and does not include a written explanation for this item.

QUESTION

A 30-year-old woman presents with weight loss, mediastinal lymphadenopathy, and pleural effusion. Her HRCT shows a "tree-in-bud" pattern, indicating lung consolidation and effusion. Analysis of pleural fluid reveals high adenosine deaminase (ADA) levels with a predominance of lymphocytes. What is the most likely finding on lymph node biopsy?

A Fungal hyphae surrounded by lymphocytes

B Anthracosis pigment

C Necrotizing epithelioid granuloma

CORRECT

D Reactive hyperplasia

RIGHT ANSWER

OK

C. Necrotizing epithelioid granuloma

WHY THIS IS RIGHT

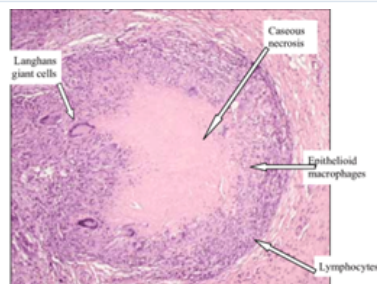
Solution

Clue	Interpretation
Weight loss	Chronic infection (-> TB, malignancy)
Mediastinal lymphadenopathy	TB / lymphoma
Pleural effusion + lymphocytes	TB until proven otherwise
High ADA in pleural fluid	Strong marker for TB
HRCT "tree-in-bud"	Endobronchial spread of infection -> classic for TB

So lymph node biopsy will show:

- ☐ Caseating (necrotizing) epithelioid granulomas
- ☐ Hallmark of Mycobacterium tuberculosis

Feature	TB Effusion
Type	Exudative
Cells	Lymphocyte predominant
ADA	↑↑ (>40 IU/L highly suggestive)
Protein	High
Glucose	Low-normal
Mechanism	Delayed hypersensitivity



QUESTION

Which of the following is considered ineffective in the prevention of COVID-19?

A Mask

B Vaccine

C Ivermectin

CORRECT

D Cough etiquette

RIGHT ANSWER

OK

C. Ivermectin

WHY THIS IS RIGHT

COVID-19:

Prevention works by:

- Blocking transmission
- Building immunity
- Reducing viral spread

| Level | Method |

| ---- | ----- |

| Primary prevention | Vaccination |

| Barrier protection | Mask |

| Behavioral | Cough etiquette |

| Not effective | Ivermectin |

| Effective | Not Effective |

| ----- | ----- |

| Mask | Ivermectin |

| Vaccination | Hydroxychloroquine (prophylaxis - outdated) |

| Hand hygiene | |

| Cough etiquette | |

- In vitro antiviral activity ≠ clinical benefit

- Required doses in lab:

- Much higher than safe human dose

No real-world effectiveness

QUESTION

A 65-year-old known case of Parkinson's disease presents with severe oropharyngeal dysphagia and recurrent episodes of aspiration pneumonitis. CXR reveals bilateral bronchiectasis. What is the most appropriate long-term management plan for this patient?

- A** High-frequency chest wall oscillation therapy
- B** Nebulized N-acetylcysteine to reduce secretions
- C** PEG tube
- D** Macrolide therapy

CORRECT

RIGHT ANSWER

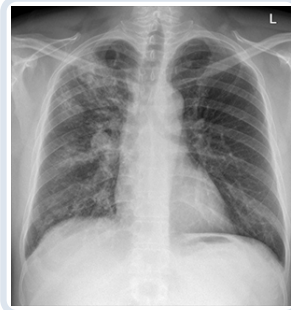
OK
C. PEG tube

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

A 36-year-old PLHIV presents with occasional fever, productive cough, and haemoptysis for 3 months. The chest X-ray is shown below. Which of the following is the most likely cause of his condition?



A Aspergillosis

B Lung abscess

C Tuberculosis

CORRECT

D Metastases

RIGHT ANSWER

OK

C. Tuberculosis

WHY THIS IS RIGHT

A 36-year-old PLHIV (Person Living with HIV) with:

- Chronic symptoms (3 months)
- Fever
- Productive cough
- Hemoptysis

This classic triad strongly points toward Pulmonary tuberculosis.

Inhalation of *Mycobacterium tuberculosis*

Alveolar macrophage infection

Cell-mediated immunity activation (Th1)

Granuloma formation

Caseous necrosis

Cavitation (especially in upper lobes)

Hemoptysis + chronic cough

| CD4 Count | TB Pattern |

| ----- | ----- |

| >200 | Typical cavitary TB |

| <200 | Atypical (lower lobe, diffuse, no cavitation) |

| <50 | Disseminated TB |

QUESTION

Which of the following has the highest risk of causing invasive pulmonary aspergillosis?

A Febrile neutropenia

CORRECT

B CD4 <50 cells/ μ L

C Severe protein-energy undernutrition

D Bronchial asthma

RIGHT ANSWER

OK A. Febrile neutropenia

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1e” here and does not include a written explanation for this item.

QUESTION

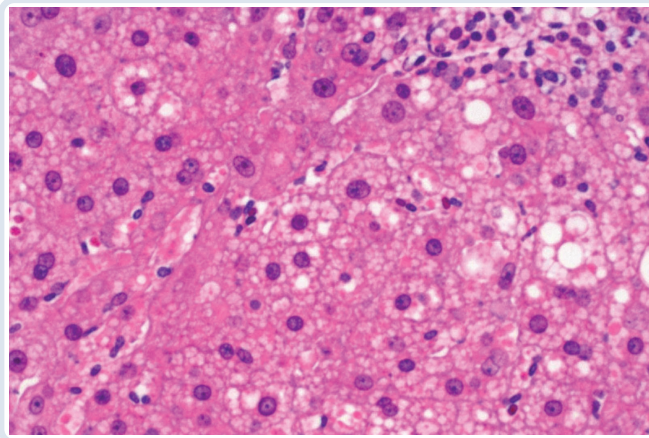
A 47-year-old man comes to the OPD due to worsening shortness of breath for several months. The patient has no fever, weight loss, or cough. Pulmonary examination demonstrates wheezing. Laboratory results are as follows:

Total bilirubin: 1.3mg/dl

AST: 112 U/L

ALT: 124 U/L

A liver biopsy is subsequently performed and show below. Given these findings, which of the following is the most likely cause of this patient's shortness of breath?



A Bronchial hyperreactivity

B Interlobular septal destruction

CORRECT

C Interstitial infiltration

D Interlobular substance accumulation

RIGHT ANSWER

OK B. Interlobular septal destruction

WHY THIS IS RIGHT

The liver biopsy shows PAS-positive, diastase-resistant globules in hepatocytes, characteristic of α_1 -antitrypsin deficiency.

- Mutated α_1 -antitrypsin accumulates in hepatocytes $\rightarrow$ liver injury ($\uparrow$ AST/ALT).
- Lack of circulating α_1 -antitrypsin allows unopposed neutrophil elastase activity in the lungs.

Pulmonary consequence:

- Destruction of interlobular septa
- Leads to panacinar emphysema, especially in the lower lobes.

Clinical features:

- Progressive dyspnea
- Wheezing without smoking history
- Liver disease.

QUESTION

A 68-year-old man comes to the emergency department due to cough, fever, breathlessness, and chest pain. The patient has a medical history of hypertension and type 2 diabetes mellitus. He is a former smoker with a 20-pack-year history. The trachea is central in position. There is dullness to percussion over the lower right lung area compared to the resonance on the left. Auscultation of the right lower lobe reveals breath sounds that are loud, hollow, and high-pitched. When the patient recites the word "ninety-nine" in a normal voice, the sound has higher clarity and intensity over the right base compared to other lung areas. Which of the following is the most likely cause of these findings?

- A** Accumulation of fluid in pleural space
- B** Embolic occlusion of a pulmonary segmental artery
- C** Exudation of neutrophil-rich fluid in the lung parenchyma
- D** Leakage of air from spontaneous rupture of visceral pleura

CORRECT

RIGHT ANSWER

- OK** C. Exudation of neutrophil-rich fluid in the lung parenchyma

WHY THIS IS RIGHT

Lobar pneumonia causes alveolar consolidation due to exudation of neutrophil-rich inflammatory fluid into the lung parenchyma.

Effects on physical examination:

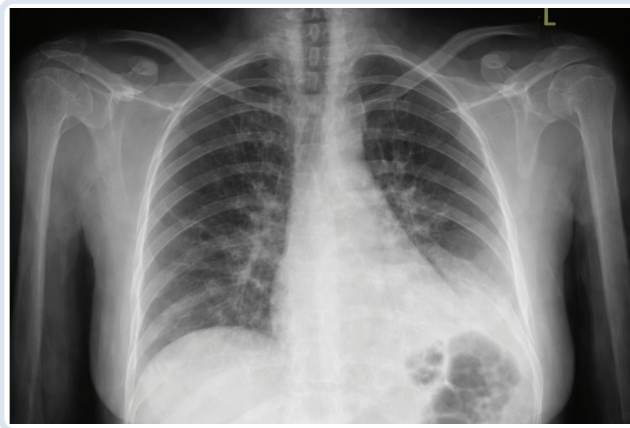
- Dullness to percussion (alveoli filled with fluid)
- Bronchial breath sounds (sound transmission enhanced through consolidated lung)
- Increased tactile fremitus and egophony ("ninety-nine" heard clearly)

Pathophysiology:

- Infection -> inflammatory exudate fills alveoli
- Consolidated lung conducts sound better than air-filled lung

QUESTION

64-year-old man comes to the emergency department due to 2 days of fever, chills, productive cough. The patient has a history of hypertension, hyperlipidemia, and type 2 diabetes mellitus. Oxygen saturation is 94% on room air when lying on his right side but drops to 89% when he lies on his left. Dullness to percussion and bronchial breath sounds are present on the left side. Imaging is shown here. Which of the following pathophysiologic mechanisms in the left lung is most responsible for the drop in oxygen saturation after the change in position?



- A Dead space ventilation
- B Effort dependent hypoventilation
- C Hypoxic vasoconstriction

D Intrapulmonary shunting

CORRECT

RIGHT ANSWER

D. Intrapulmonary shunting

WHY THIS IS RIGHT

Intrapulmonary shunting occurs when alveoli are perfused but not ventilated, resulting in deoxygenated blood entering the systemic circulation.

Common causes:

- Lobar pneumonia
- Atelectasis
- Pulmonary edema
- ARDS

Key concept in positional hypoxemia:

- When the patient lies on the affected lung (dependent side), more blood flow goes to poorly ventilated alveoli due to gravity.
- This increases shunting and worsens hypoxemia.

Clinical clues:

- Dullness to percussion
- Bronchial breath sounds
- Suggest lung consolidation (e.g., pneumonia).

QUESTION

What is the route of dissemination of the following disease?



A Air-borne

B Feco-oral

C Droplet

D Hematogeneous

CORRECT

RIGHT ANSWER

OK

D. Hematogeneous

WHY THIS IS RIGHT

The lung specimen shows numerous tiny nodules scattered throughout the lung, characteristic of miliary tuberculosis.

Pathogenesis:

- Occurs due to hematogenous dissemination of *Mycobacterium tuberculosis*
- Bacilli spread through the bloodstream, producing multiple millet seed-sized granulomas in both lungs and sometimes other organs.

Clinical importance:

- Seen in immunocompromised patients or severe primary TB
- Can involve lungs, liver, spleen, bone marrow, and meninges

QUESTION

A patient in emergency admitted to ICU based on the appropriate score with the following CXR presentation. What is the treatment of choice in this patient?



- A Mechanical ventilation
- B Ceftriaxone plus azithromycin**
- C Ceftriaxone plus Doxycycline
- D LMW heparin

CORRECT

RIGHT ANSWER

- B. Ceftriaxone plus azithromycin**

WHY THIS IS RIGHT

Severe community-acquired pneumonia (CAP) requiring ICU admission should be treated with combination antibiotic therapy to cover both typical and atypical pathogens.

Recommended regimen:

- β -lactam (e.g., ceftriaxone) -> covers *Streptococcus pneumoniae* and other typical bacteria
- Macrolide (e.g., azithromycin) -> covers atypical organisms (*Mycoplasma*, *Chlamydia*, *Legionella*)

Severity assessment tools:

- CURB-65
- PSI (Pneumonia Severity Index)

Patients meeting severe criteria should receive IV β -lactam + macrolide or β -lactam + respiratory fluoroquinolone.

QUESTION

A 50-year-old chronic smoker presented with mild recurrent hemoptysis without fever or weight loss. The chest X-ray appears normal and the sputum is negative for AFB. Which of the following is the next best step?

- A MRI
- B Fiberoptic bronchoscopy
- C HRCT thorax
- D Rigid bronchoscopy

CORRECT

RIGHT ANSWER

OK
C. HRCT thorax

WHY THIS IS RIGHT

In a chronic smoker with recurrent hemoptysis and a normal chest X-ray, the next best investigation is HRCT of the thorax.

- HRCT is more sensitive than chest X-ray for detecting small lung tumors, bronchiectasis, vascular lesions, or early malignancy.
- It helps localize the source of bleeding and guides further procedures such as bronchoscopy.

Clinical approach to hemoptysis with normal CXR:

1. HRCT thorax to identify occult lung pathology
2. Bronchoscopy if imaging suggests an endobronchial lesion or bleeding source

QUESTION

Atypical pneumonia can be caused by all of the following organisms except:

A Mycoplasma pneumoniae

B Legionella pneumophila

C Human coronavirus

D Klebsiella pneumoniae

CORRECT

RIGHT ANSWER

OK

D. Klebsiella pneumoniae

WHY THIS IS RIGHT

Atypical pneumonia is caused by pathogens that do not produce classic lobar consolidation and often present with gradual onset of dry cough, low-grade fever, and diffuse interstitial infiltrates.

Common causes:

- Mycoplasma pneumoniae
- Legionella pneumophila
- Viruses (e.g., influenza, human coronavirus)
- Chlamydophila pneumoniae

Klebsiella pneumoniae is a typical bacterial cause of pneumonia, producing lobar consolidation with thick “currant jelly” sputum, often in alcoholics or debilitated patients.

QUESTION

A 45-year-old woman presents with progressive dyspnea, dry cough, and tingling with numbness in both feet for the last 6 months. She also complains of dry eyes and dry mouth. HRCT chest is given below:
The most likely pulmonary diagnosis is:



- A** Idiopathic pulmonary fibrosis
- B** Lymphoid interstitial pneumonia
- C** Pulmonary Langerhans cell histiocytosis
- D** Hypersensitivity pneumonitis

CORRECT

RIGHT ANSWER

- OK** **B. Lymphoid interstitial pneumonia**

WHY THIS IS RIGHT

Lymphoid interstitial pneumonia (LIP) is an interstitial lung disease characterized by diffuse lymphocytic infiltration of the pulmonary interstitium. Key associations:

- Autoimmune diseases, especially Sjögren syndrome
- HIV infection

Clinical clues:

- Dry cough and progressive dyspnea
- Dry eyes and dry mouth (sicca symptoms) suggesting Sjögren syndrome
- Peripheral neuropathy may occur.
- HRCT findings: Diffuse ground-glass opacities and Multiple thin-walled pulmonary cysts

Why not other options:

- A. Idiopathic pulmonary fibrosis: Shows basal subpleural fibrosis and honeycombing, not multiple thin-walled cysts; usually in older patients.
- C. Pulmonary Langerhans cell histiocytosis: Smoking-related, with upper-lobe nodules and cysts, not associated with Sjögren symptoms.
- D. Hypersensitivity pneumonitis: Shows ground-glass opacities and centrilobular nodules, linked to antigen exposure, not diffuse cysts.

QUESTION

Benralizumab acts by targeting which of the following immune mediators or receptors?

A Anti-IgE

B Anti-IL-5 receptor

CORRECT

C Anti-IL-4 receptor

D Anti-IL-6 receptor

RIGHT ANSWER

OK

B. Anti-IL-5 receptor

WHY THIS IS RIGHT

Benralizumab is a monoclonal antibody that targets the IL-5 receptor α on eosinophils.

It causes antibody-dependent cell-mediated cytotoxicity, leading to near-complete eosinophil depletion.

It is used in severe eosinophilic asthma unresponsive to standard therapy.

Contrast:

- Anti-IgE: Omalizumab
- Anti-IL-4 receptor: Dupilumab
- Anti-IL-6 receptor: Tocilizumab

QUESTION

A 24-year-old female with a history of severe persistent asthma is currently on inhaled corticosteroids (ICS) and long-acting beta-agonists (LABA). Despite adherence to therapy, she continues to have seasonal exacerbations. Her FEV1 is within normal limits. Laboratory investigations reveal elevated serum IgE levels. What is the most appropriate next step in management?

A Oral antibiotics and short-acting beta-agonists (SABA)

B Intravenous terbutaline

C Subcutaneous omalizumab

CORRECT

D Intravenous corticosteroids

RIGHT ANSWER

OK C. Subcutaneous omalizumab

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$19" here and does not include a written explanation for this item.

QUESTION

Theophylline was prescribed to a male patient with chronic obstructive pulmonary disease (COPD). The next day, he noticed that his urine output had increased. Which of the following receptors is responsible for the drug's action?

- A** Interleukin-10
- B** Histone deacetylase
- C** Adenosine A
- D** Beta 2 adrenergic receptors

CORRECT

RIGHT ANSWER

- OK** **C. Adenosine A**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1a” here and does not include a written explanation for this item.

QUESTION

A 24-year-old male who is a known case of bronchial asthma presented for a routine follow-up. PFT was done earlier-his FEV1 was 70%, which improved to 83% after bronchodilator nebulization. He was already on MDI Albuterol daily. On questioning, it seems like he is being symptomatic for at least 2 times per week and is waking up in the nights due to symptoms at least once per week. On examination, there are scattered rhonchi. What should be done?

A Add Fluticasone MDI two times a day

CORRECT

B Shift to MDI Salmeterol two times a day

C Add Prednisolone 10mg

D Continue the current management

RIGHT ANSWER

OK

A. Add Fluticasone MDI two times a day

WHY THIS IS RIGHT

Symptoms ≥ 2 times/week with nighttime awakening indicate persistent asthma, despite SABA use.

PFT shows reversibility, confirming asthma with inadequate anti-inflammatory control.

The correct step-up is adding an inhaled corticosteroid (fluticasone) to treat airway inflammation.

Severity	Symptoms	Treatment
-----	-----	-----
Intermittent	<2/week	SABA
Mild persistent	≥ 2 /week	Low-dose ICS
Moderate persistent	Daily symptoms	ICS + LABA
Severe	Continuous	High-dose ICS + LABA

QUESTION

A patient with dyspnea, respiratory distress due to pan-acinar emphysema, and liver dysfunction is due to a likely defect in which of the following?

A ATP7A gene

B ATP7B gene

C Alpha 1 anti-trypsin deficiency

CORRECT

D Surfactant defect

RIGHT ANSWER

OK C. Alpha 1 anti-trypsin deficiency

WHY THIS IS RIGHT

Pan-acinar emphysema with early-onset dyspnea and liver dysfunction is classic for α_1 -antitrypsin deficiency.

Loss of α_1 -antitrypsin leads to unopposed neutrophil elastase activity, causing diffuse alveolar destruction, predominantly in lower lobes.

Misfolded protein accumulation in hepatocytes explains the associated liver disease.

Normal:

Neutrophils → Elastase (destroys elastin)

↓ Alpha-1 antitrypsin

↓

Unopposed elastase activity

↓

Alveolar wall destruction

↓

Pan-acinar emphysema

| Type | Cause | Location |

| --- | ---- | -

| Pan-acinar | A1AT deficiency | Lower lobes |

| Centriacinar | Smoking | Upper lobes |

| Paraseptal | Subpleural | Risk of pneumothorax |

QUESTION

A female patient with a known case of bronchial asthma is on levosalbutamol and Ipratropium bromide metered-dose inhalers. She now reports frequent nocturnal symptoms, including wheezing and breathlessness that wake her up several times a week. What is the most appropriate next step in management?

A Increase dose of Salbutamol nebulization

B Add Corticosteroids orally

C Add LABA and inhaled corticosteroid (ICS)

CORRECT

D Add Montelukast

RIGHT ANSWER

OK

C. Add LABA and inhaled corticosteroid (ICS)

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

A man with a history of COPD presents with an acute exacerbation. His vitals are given below. According to GOLD criteria, which of the following is/are used in the management of this case?

RR - 30/min, Pulse - 112/min, SpO₂ - 87% under RA, pCO₂ - 60 mmHg

1. Antibiotics
2. Steroids
3. Antivirals
4. Nebulised bronchodilators

A 1, 2 and 3

B 1, 2 and 4

CORRECT

C 2, 3 and 4

D 1 and 4

RIGHT ANSWER

OK B. 1, 2 and 4

WHY THIS IS RIGHT

- RR: 30/min -> Tachypnea
- Pulse: 112/min -> Distress
- SpO₂: 87% (room air) -> Hypoxemia
- pCO₂: 60 mmHg -> Hypercapnia

This is acute exacerbation of COPD (AECOPD) with Type II respiratory failure.

Rx: Bronchodilators Steroids Antibiotics (if infection)

Oxygen (target SpO₂ 88-92%)

If CO₂ retention -> NIV (BiPAP)

Treatment	Role	Indication
Nebulised bronchodilators	Relieve bronchospasm	ALL patients
Systemic steroids	Reduce inflammation	Moderate-severe
Antibiotics	If infection suspected	Purulent sputum / severe
Oxygen	Correct hypoxemia	Target 88-92%
NIV (BiPAP)	↓ CO ₂	Hypercapnia

QUESTION

In a COPD patient what is the critical value of FEV1 for patients to develop resting hypoxemia?

A 50%

B 20%

C 30%

CORRECT

D 40%

RIGHT ANSWER

OK

C. 30%

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1c" here and does not include a written explanation for this item.

QUESTION

Which of the following is not seen with the use of inhaled β_2 -adrenergic agonists?

A Hyperkalemia

CORRECT

B Tremor

C Palpitation

D Pulmonary vasodilation

RIGHT ANSWER

OK

A. Hyperkalemia

WHY THIS IS RIGHT

Drugs like Salbutamol and Formoterol are bronchodilators acting via:

Mechanism

- Stimulate β_2 receptors (Gs protein)
- $\uparrow$ Adenylyl cyclase $\rightarrow \uparrow$ cAMP
- Smooth muscle relaxation $\rightarrow$ bronchodilation

- 1) Bronchial smooth muscle relaxation $\rightarrow$ Bronchodilation
 - 2) Skeletal muscle stimulation $\rightarrow$ Tremors
 - 3) Cardiac β_1 spillover $\rightarrow$ Palpitations
 - 4) $\uparrow$ Na^+/K^+ ATPase activity
- K^+ shifts into cells
Hypokalemia

QUESTION

A patient with chronic productive cough and progressive breathlessness is diagnosed with COPD. He develops type II respiratory failure. Which of the following statements regarding his condition is not true?

A Bronchial wall inflammation is a characteristic finding

B Increased Reid index

C Lung compliance is decreased

CORRECT

D FEV₁/FVC ratio is <70%

RIGHT ANSWER

OK C. Lung compliance is decreased

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

| Which of the following statements about Ciclesonide is incorrect?

A Oral candidiasis is common with its use

CORRECT

B It has fewer side effects than other inhalational corticosteroids.

C It is a prodrug activated by bronchial esterase.

D It has comparable efficacy to other inhalational corticosteroids.

RIGHT ANSWER

OK

A. Oral candidiasis is common with its use

WHY THIS IS RIGHT

Ciclesonide

A clever inhaled corticosteroid that behaves like a “stealth prodrug”-> Active only in the lungs

Ciclesonide is an inhaled corticosteroid prodrug activated in the lungs by bronchial esterases. Because activation occurs locally, oropharyngeal deposition is minimal and oral candidiasis is uncommon. It has fewer systemic and local side effects while maintaining efficacy comparable to other inhaled steroids. Hence stating candidiasis is common is incorrect.

Feature	Ciclesonide	Other ICS
-----	-----	-----
Prodrug	☐ Yes ☐ No	
Activation	Lung only	Everywhere
Oral candidiasis	↓ Low ↑ Higher	
Systemic effects	↓ Minimal ↑ More	

QUESTION

A 34-year-old woman comes to the office for evaluation of recurrent transient pulmonary infiltrates. The patient has a history of bronchial asthma and has had several exacerbations over the past few years, particularly during the winter months. Her medications include albuterol as needed and medium-dose inhaled glucocorticoids. Complete blood count shows eosinophilia. A chest CT scan reveals proximal bronchiectasis. This patient's condition is most likely related to colonization with which of the following?

A Adenovirus

B **Aspergillus fumigatus**

CORRECT

C Strongyloides

D Paragonimus

RIGHT ANSWER

OK B. **Aspergillus fumigatus**

WHY THIS IS RIGHT

Allergic bronchopulmonary aspergillosis (ABPA) occurs due to hypersensitivity to colonization of the airways by *Aspergillus fumigatus*, commonly in patients with asthma or cystic fibrosis.

- Recurrent transient pulmonary infiltrates
- Eosinophilia
- Elevated IgE levels
- Central (proximal) bronchiectasis on CT
- Worsening asthma symptoms

Pathophysiology:

- Type I (IgE-mediated) and Type III hypersensitivity reactions to *Aspergillus* antigens in the bronchi.

Treatment:

- Oral corticosteroids
- Sometimes antifungal therapy (e.g., itraconazole).

QUESTION

A 4-year-old boy is brought to the emergency department for difficulty breathing and a productive cough. He has a past medical history of recurrent episodes of sinusitis and otitis media. The respiratory infections typically have a protracted course but respond to high-dose antibiotic therapy. Pulmonary auscultation shows crackles and wheezing. Cardiovascular examination shows a cardiac point of maximal impulse that is palpated at the right 5th intercostal space. Which of the following is most likely to be dysfunctional in this patient?

A C1 complement component

B Chloride channels

C Dynein arms

CORRECT

D IL-2 receptors

RIGHT ANSWER

OK

C. Dynein arms

WHY THIS IS RIGHT

Kartagener syndrome is a subtype of primary ciliary dyskinesia caused by defective dynein arms in motile cilia.

- Dynein arm defect -> impaired ciliary motility
- Leads to poor mucociliary clearance and recurrent respiratory infections.

Classic triad:

- Chronic sinusitis
- Bronchiectasis
- Situs inversus (e.g., cardiac apex on the right side)

Other features:

- Recurrent otitis media
- Infertility due to defective sperm flagella.

QUESTION

A 45-year-old man presents with progressive shortness of breath over the past few years. He has no history of smoking and works as an accountant. Physical examination reveals diminished breath sounds and hyperresonance to percussion. A chest X-ray shows basilar emphysema. His liver function tests are mildly elevated. Which of the following properties correlate with the histopathology staining in this condition?

- A** Periodic Acid Schiff - Positive, Diastase - Sensitive
- B** Periodic Acid Schiff - Positive, Diastase -Resistant
- C** Periodic Acid Schiff - Negative, Diastase -Sensitive
- D** Periodic Acid Schiff - Negative, Diastase - Resistant

CORRECT

RIGHT ANSWER

- B. Periodic Acid Schiff - Positive, Diastase -Resistant**

WHY THIS IS RIGHT

Alpha-1 antitrypsin (A1AT) deficiency causes early-onset basilar emphysema and liver disease due to accumulation of abnormal A1AT protein in hepatocytes.

- Hepatocytes contain misfolded A1AT protein aggregates
- These inclusions are Periodic Acid-Schiff (PAS) positive and diastase resistant

Reason:

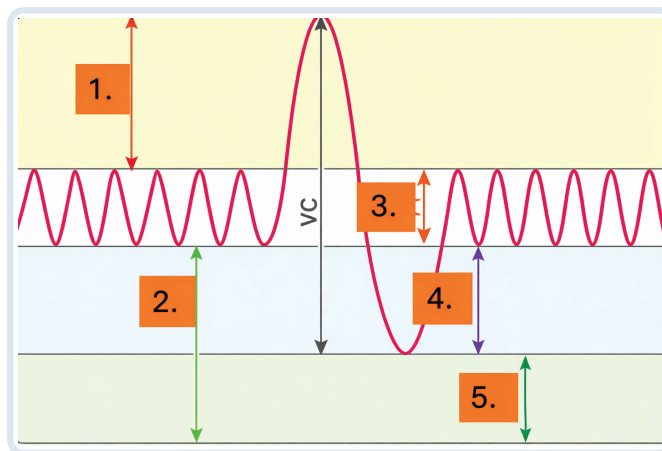
- PAS stains glycoproteins such as A1AT.
- Diastase removes glycogen, but the protein inclusions remain, so staining persists.

Clinical clue:

- Non-smoker with basilar emphysema + abnormal liver tests -> think A1AT deficiency.

QUESTION

The image below demonstrates normal lung volumes and capacities. Which of the following changes is unlikely in a “pink puffer”?



A 2 is increased

B 1+2+3 is decreased

CORRECT

C 5 is increased

D 1+3+4 is decreased

RIGHT ANSWER

OK

B. 1+2+3 is decreased

WHY THIS IS RIGHT

A “pink puffer” refers to patients with emphysema, a form of COPD characterized by alveolar wall destruction and loss of elastic recoil.

Typical lung volume changes in emphysema:

- ↑ Residual volume (RV) due to air trapping
- ↑ Functional residual capacity (FRC)
- ↑ Total lung capacity (TLC) from hyperinflation
- ↓ Vital capacity (VC)

Thus, TLC (1+2+3) is usually increased, not decreased.

QUESTION

A 68-year-old man with severe COPD ($FEV_1 < 50\%$ predicted) presents for follow-up. He is an ex-smoker and is on maximal inhaled therapy including a long-acting β_2 -agonist, long-acting muscarinic antagonist, and inhaled corticosteroids. Despite good adherence, he has had three acute exacerbations requiring oral steroids and antibiotics in the past year. Which of the following is the most appropriate next step to reduce the frequency of future exacerbations?

A Add long-term low-dose azithromycin therapy

CORRECT

B Start daily oral corticosteroids

C Add theophylline

D Increase the dose of inhaled corticosteroids further

RIGHT ANSWER

OK

A. Add long-term low-dose azithromycin therapy

WHY THIS IS RIGHT

In severe COPD with frequent exacerbations despite maximal inhaled therapy (LABA + LAMA + ICS), long-term low-dose macrolide therapy (e.g., azithromycin) can reduce the frequency of exacerbations.

- Macrolides have anti-inflammatory and immunomodulatory effects in addition to antibacterial activity.
- They help reduce airway inflammation and exacerbation risk.

Clinical indication:

- Severe COPD
- ≥ 2 exacerbations per year despite optimal inhaled therapy
- Particularly useful in former smokers.

QUESTION

A 37-year-old man with asthma is evaluated for frequent episodes of wheezing and dyspnea that are unrelieved by short-acting β -agonist therapy. He uses his controller medications regularly, including an inhaled long-acting β -agonist and high-dose inhaled corticosteroids. Spirometry shows an FEV₁ of 65% of predicted. After supervised use of a bronchodilator in the office, there is some relief of symptoms, and repeat spirometry 10 minutes after administration of SABA shows FEV₁ increased to 85% of predicted. Which of the following is the most appropriate next step in this patient's management?

A Add a leukotriene-modifying drug

B Have the patient demonstrate his inhaler technique

CORRECT

C Start omalizumab therapy

D Start oral prednisone therapy

RIGHT ANSWER

OK B. Have the patient demonstrate his inhaler technique

WHY THIS IS RIGHT

In patients with poorly controlled asthma despite appropriate medications, the first step is to assess inhaler technique and medication adherence before escalating therapy.

- Incorrect inhaler use is a common cause of inadequate symptom control.
- This patient shows significant bronchodilator reversibility (FEV₁ improved from 65% -> 85% predicted), suggesting the medications are effective when delivered properly.

Clinical approach in uncontrolled asthma:

1. Check inhaler technique
2. Assess medication adherence
3. Identify triggers/comorbidities
4. Then consider step-up therapy if needed.

QUESTION

Pseudonormalization of the Tiffeneau-Pinelli index on spirometry is most suggestive of which of the following conditions?

- A Early obstructive lung disease
- B Advanced obstructive lung disease**
- C Parenchymal restrictive lung disease
- D Extraparenchymal restrictive lung disease

CORRECT

RIGHT ANSWER

- B. Advanced obstructive lung disease**

WHY THIS IS RIGHT

The Tiffeneau-Pinelli index (FEV_1/FVC) normally decreases in obstructive lung disease because FEV_1 falls more than FVC.

In advanced obstructive disease, severe air trapping and hyperinflation reduce FVC disproportionately, causing the FEV_1/FVC ratio to appear normal or near normal (pseudonormalization).

Example: Severe COPD/emphysema.

QUESTION

A pulmonary function test shows a Tiffeneau-Pinelli index of less than 0.70. This finding is diagnostic of which of the following lung diseases?

A Obstructive lung disease

CORRECT

B Restrictive lung disease

C Isolated defect of diffusion

D None of the above

RIGHT ANSWER

OK A. Obstructive lung disease

WHY THIS IS RIGHT

The Tiffeneau-Pinelli index is the ratio FEV_1 / FVC used to assess airflow limitation.

- Normal: ≥ 0.70 -0.80
- < 0.70 : Indicates airflow obstruction

Seen in obstructive lung diseases:

- COPD
- Asthma
- Bronchiectasis
- Emphysema

In obstruction, FEV_1 decreases more than FVC due to difficulty expelling air rapidly.

QUESTION

A 24-year-old male presents with a history of recurrent sinus infections since childhood and chronic productive cough. On examination, heart sounds are best heard on the right side of the chest. He also reports inability to conceive despite normal libido and erectile function. High-resolution CT of the chest is most likely to show which of the following findings?

A Dilatation of lower lobe bronchi with thickened bronchial walls

CORRECT

B Uniform enlargement of acini predominantly involving lower lobes

C Patchy destruction of alveolar septa predominantly in upper lobes

D Hyperplasia of mucous glands with Reid index > 50%

RIGHT ANSWER

OK **A. Dilatation of lower lobe bronchi with thickened bronchial walls**

WHY THIS IS RIGHT

The triad of chronic sinusitis, bronchiectasis, and situs inversus with male infertility suggests Kartagener syndrome, a form of primary ciliary dyskinesia.

- Defective dynein arms in cilia -> impaired mucociliary clearance
- Leads to recurrent respiratory infections and bronchiectasis
- Defective flagella in sperm -> infertility

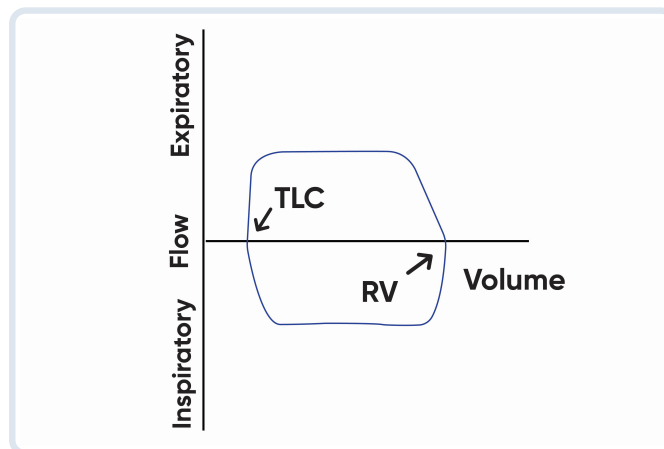
Imaging finding (HRCT): Bronchiectasis characterized by dilatation of bronchi with thickened bronchial walls, commonly affecting the lower lobes.

Why other options are incorrect:

- B. Uniform enlargement of acini in lower lobes: Seen in panacinar emphysema (classically due to α_1 -antitrypsin deficiency), not Kartagener syndrome.
- C. Patchy destruction of alveolar septa in upper lobes: Seen in centriacinar emphysema, typically associated with smoking.
- D. Hyperplasia of mucous glands with Reid index >50%: Characteristic of chronic bronchitis.

QUESTION

A 45-year-old woman presents with progressive exertional dyspnea and biphasic stridor. Pulmonary function testing with a flow-volume loop shows
Which of the following conditions is most likely responsible for this pattern?



A Vocal cord paralysis

B Tracheal stenosis

CORRECT

C Bronchial asthma

D Myasthenia gravis

RIGHT ANSWER

OK

B. Tracheal stenosis

WHY THIS IS RIGHT

A fixed upper airway obstruction produces flattening of both inspiratory and expiratory limbs on the flow-volume loop.

- Airflow limitation occurs during both inspiration and expiration because the obstruction does not change with intrathoracic pressure.

Common causes:

- Tracheal stenosis
- Tracheal tumors
- Large goiter

Presence of biphasic stridor (heard during both inspiration and expiration).

Why other options are incorrect:

- A. Vocal cord paralysis: Variable extrathoracic obstruction -> flattened inspiratory limb only.
- C. Bronchial asthma: Obstructive pattern -> scooped expiratory curve.
- D. Myasthenia gravis: Restrictive pattern due to respiratory muscle weakness.

QUESTION

A 60-year-old man with a 40 pack-year smoking history presents with progressive dyspnea and weight loss. Examination reveals a barrel-shaped chest and decreased breath sounds bilaterally. Pulmonary function testing is performed. Which of the following spirometry and lung volume findings are most consistent with emphysema?

A ↓ FEV₁, normal FEV₁/FVC, ↓ TLC, ↓ RV

B ↓ FEV₁, ↓ FEV₁/FVC, ↑ TLC, ↑ RV

CORRECT

C Normal FEV₁, ↑ FEV₁/FVC, ↓ TLC, ↓ RV

D ↓ FEV₁, ↑ FEV₁/FVC, normal TLC, normal RV

RIGHT ANSWER

OK B. ↓ FEV₁, ↓ FEV₁/FVC, ↑ TLC, ↑ RV

WHY THIS IS RIGHT

Emphysema is an obstructive lung disease characterized by destruction of alveolar walls and loss of elastic recoil, leading to air trapping and lung hyperinflation.

Pulmonary function test findings:

- ↓ FEV₁ due to airway obstruction
- ↓ FEV₁/FVC ratio (<70%) indicating obstructive pattern
- ↑ Total lung capacity (TLC) from hyperinflation
- ↑ Residual volume (RV) due to air trapping

Patients often have progressive dyspnea, barrel-shaped chest, and decreased breath sounds, especially with a long smoking history.

QUESTION

Find out the true and false statements regarding paradoxical bronchoconstriction with ipratropium bromide

Statements:

- A. It particularly occurred when given by nebulizer
- B. It is due to antibacterial additives added with ipratropium
- C. This will not be seen when given by MDI
- D. This problem primarily is due to blockade of prejunctional M2 receptors
- E. This problem is not seen with tiotropium bromide

A A-T, B-T, C-F, D-F, E-T

B A-T, B-T, C-T, D-F, E-F

C A-F, B-T, C-T, D-T, E-T

D A-T, B-T, C-F, D-T, E-T

CORRECT

RIGHT ANSWER

OK D. A-T, B-T, C-F, D-T, E-T

WHY THIS IS RIGHT

Paradoxical bronchoconstriction can rarely occur with ipratropium bromide, especially when given via nebulization.

- Nebulized preparations may contain antibacterial preservatives (e.g., benzalkonium chloride) that can trigger bronchospasm.
- Blockade of prejunctional M₂ muscarinic receptors may increase acetylcholine release, causing bronchoconstriction.

Important points:

- This reaction is more common with nebulized ipratropium than with MDI formulations.
- Tiotropium is more selective for M₁ and M₃ receptors and spares M₂ receptors, so paradoxical bronchoconstriction is not typically seen.

QUESTION

A patient presents with progressive shortness of breath for the last 6 months, accompanied by dry cough. Auscultation reveals bilateral basal end-inspiratory crepitations. There is no history of fever, joint pain, or occupational exposure. What is the diagnosis?



- A** Cor-pulmonale
- B** Sarcoidosis
- C** Idiopathic pulmonary fibrosis
- D** Hypersensitivity pneumonitis

CORRECT

RIGHT ANSWER

- OK** **C. Idiopathic pulmonary fibrosis**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$19” here and does not include a written explanation for this item.

QUESTION

A worker employed in a cement factory presented with shortness of breath and was diagnosed with mesothelioma. Which of the following is the most likely risk factor responsible for this condition?

A Silica dust

B Metastasis

C Tuberculosis

D Asbestos

CORRECT

RIGHT ANSWER

OK

D. Asbestos

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1a” here and does not include a written explanation for this item.

QUESTION

A mason working in a stone factory in Kota, Rajasthan, presented with complaints of dry cough and shortness of breath. Chest X-ray revealed eggshell calcification, as shown in the image below. Which of the following conditions is he most likely suffering from?



A Asbestosis

B Bagassosis

C Silicosis

CORRECT

D Anthracosis

RIGHT ANSWER

OK C. Silicosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

A patient presents to you with fever, night sweats, ptosis, and bilateral facial nerve palsy. Investigations showed leukocytosis and bilateral hilar lymphadenopathy. Which of the following is the most likely diagnosis?

A Sarcoidosis

CORRECT

B Tuberculosis

C Lymphoma

D Hypersensitive pneumonitis

RIGHT ANSWER

OK
A. Sarcoidosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1c” here and does not include a written explanation for this item.

QUESTION

A middle aged cement factory worker has developed mesothelioma. This is likely to be associated with

- A Silicosis
- B Asbestosis**
- C Anthracosis
- D Byssinosis

CORRECT

RIGHT ANSWER

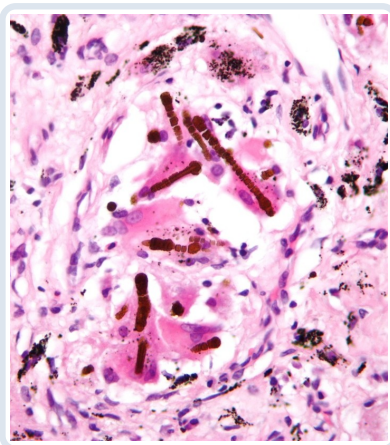
B. Asbestosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

A worker in an industry for the last 20 years develops dry cough and chest tightness. He had the following finding in his pulmonary biopsy. What is the likely diagnosis?



- A** Silicosis
- B** Anthracosis
- C** Berylliosis
- D** Asbestosis

CORRECT

RIGHT ANSWER

OK
D. Asbestosis

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1e" here and does not include a written explanation for this item.

QUESTION

Patient presents with cough, stridor, and dyspnea. On examination, there was lymphadenopathy. Histopathological examination of the lymph node shows granulomas with giant cells and stellate concretions. Which of the following is the most likely diagnosis?

A Hypersensitivity pneumonitis

B Churg Strauss syndrome

C Tuberculosis

D Sarcoidosis

CORRECT

RIGHT ANSWER

OK

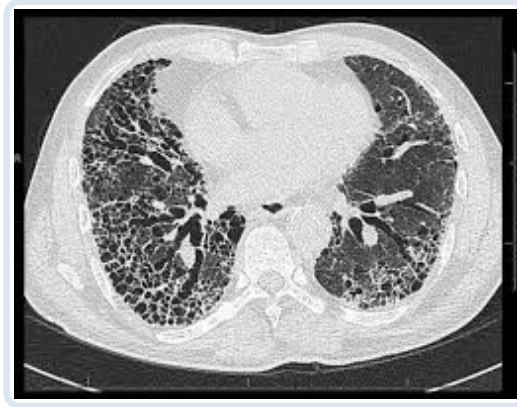
D. Sarcoidosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1f” here and does not include a written explanation for this item.

QUESTION

A 48-year-old woman presents with progressive shortness of breath and a dry cough for the past 6 months. HRCT chest is given below. All of the following are true about this condition except.



A End inspiratory coarse crackles are heard

CORRECT

B Honeycombing with reticular markings is visible on HRCT

C Both pneumococcal and influenza vaccines are advised for such patients

D Rheumatoid arthritis is associated with this condition

RIGHT ANSWER

OK

A. End inspiratory coarse crackles are heard

WHY THIS IS RIGHT

A 48-year-old with:

- Progressive dyspnea
- Dry cough
- HRCT: honeycombing + reticular opacities

Idiopathic pulmonary fibrosis (a prototype ILD)

HRCT of the lungs showing the classical UIP pattern: honeycomb transformation

Classic Imaging:

- Subpleural + basal predominance
- Honeycombing (clustered cystic air spaces)
- Reticular pattern
- Traction bronchiectasis

| Type of Crackles | Disease |

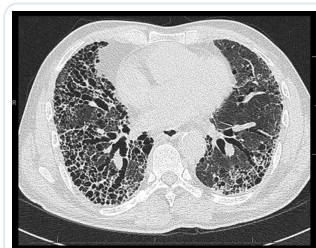
| ----- | ----- |

| Fine ("Velcro") | ILD, pulmonary fibrosis |

| Coarse | Bronchiectasis, pneumonia |

| Late inspiratory | Fibrosis |

| Early inspiratory | COPD |



QUESTION

A 38-year-old man comes to the OPD with reports of dyspnea on exertion and decreased exercise tolerance. His medical history is unremarkable, and he has no history of childhood asthma or cough. The patient has gained almost 30kg over the past 4 years due to a sedentary lifestyle. He currently has a BMI of 41 kg/m². His respiratory rate is 22/min and pulse oximetry is 93% on room air at rest. Physical examination is notable for central obesity. Lungs are clear on auscultation bilaterally. Which of the following changes are most likely to be seen on pulmonary function testing in this patient?

CORRECT

A FEV1 low, FVC low, RV normal, TLC low

B FEV1 low, FVC low, RV high, TLC high

C FEV1 high, FVC low, RV normal, TLC low

D FEV1 low, FVC low, RV high, TLC low

RIGHT ANSWER

OK

A. FEV1 low, FVC low, RV normal, TLC low

WHY THIS IS RIGHT

Severe obesity (BMI ≥ 40) can cause a restrictive ventilatory defect due to reduced chest wall compliance and diaphragmatic limitation.

Pulmonary function test findings in obesity-related restriction:

- $\downarrow$ FEV₁
- $\downarrow$ FVC
- Normal or mildly reduced RV
- $\downarrow$ Total lung capacity (TLC)

Reason:

Excess abdominal and thoracic fat limits lung expansion, reducing lung volumes but preserving the FEV₁/FVC ratio (restrictive pattern).

QUESTION

A sugarcane farmer presents with dyspnea and cough for the last 3 weeks. HRCT shows bilateral ground glass opacities and centrilobular nodules. Lung biopsy shows poorly formed noncaseating granulomas. BAL CD4: CD8 ratio is 2:1. Which of the following is the likely diagnosis?

A Sarcoidosis

B NSIP

C Hypersensitivity pneumonitis

CORRECT

D Tuberculosis

RIGHT ANSWER

OK

C. Hypersensitivity pneumonitis

WHY THIS IS RIGHT

Hypersensitivity pneumonitis (HP) is an immune-mediated interstitial lung disease caused by repeated inhalation of organic antigens such as moldy hay, sugarcane dust, bird proteins, or agricultural dust.

- Type III and Type IV hypersensitivity reactions
- Poorly formed noncaseating granulomas
- Interstitial lymphocytic inflammation

HRCT findings: Ground-glass opacities, Centrilobular nodules and Mosaic attenuation or air trapping.

BAL findings: Typically, lymphocytosis with decreased CD4:CD8 ratio (<1).

Why not other options:

- A. Sarcoidosis: Has well-formed noncaseating granulomas and typically bilateral hilar lymphadenopathy; BAL CD4:CD8 ratio is high (>3.5).
- B. NSIP: Shows uniform interstitial inflammation/fibrosis, no granulomas.
- D. Tuberculosis: Shows caseating granulomas and AFB positivity.

QUESTION

A 45-year-old patient came with hypoxemia and a normal alveolar-arterial oxygen gradient. What can be the cause?

- A Right to left shunt
- B Ventilation/Perfusion mismatch
- C Hypoventilation
- D Alveolar membrane damage

CORRECT

RIGHT ANSWER

OK C. Hypoventilation

WHY THIS IS RIGHT

The alveolar-arterial (A-a) oxygen gradient helps determine the cause of hypoxemia.

Normal A-a gradient with hypoxemia suggests alveolar hypoventilation, where:

- Ventilation is reduced
- Both alveolar and arterial PO_2 decrease proportionally
- Therefore, the A-a gradient remains normal

Causes of hypoventilation:

- CNS depression (sedatives, opioids)
- Neuromuscular disorders
- Chest wall disorders
- Severe obesity (obesity hypoventilation syndrome)

Contrast:

- Right-to-left shunt, V/Q mismatch, and diffusion impairment -> increase the A-a gradient.

QUESTION

A chronic smoker presents with cough and weight loss. Chest X-ray reveals a lung mass, and biopsy demonstrates chromogranin and synaptophysin positivity. Which of the following paraneoplastic syndromes is most likely associated with this condition?

A Hypercalcemia

B SIADH

CORRECT

C Gynecomastia

D Clubbing

RIGHT ANSWER

OK
B. SIADH

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$19” here and does not include a written explanation for this item.

QUESTION

A 65-year-old chronic smoker came to the medicine outpatient department with complaints of upper chest discomfort and drooping of an eyelid. He also complained of pain radiating to the upper arm and a tingling sensation in the 4th and 5th digits of his left hand. The chest X-ray is given below. What is the most likely diagnosis?



A Pancoast tumor

CORRECT

B Upper lobe pneumonia

C Superior vena cava obstruction

D Aspergilloma

RIGHT ANSWER

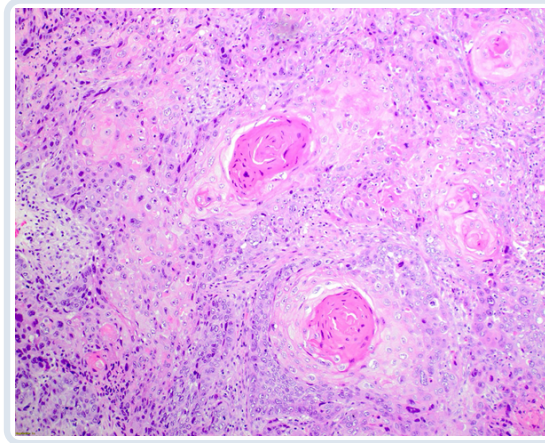
OK A. Pancoast tumor

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1a" here and does not include a written explanation for this item.

QUESTION

A 56-year-old chronic smoker presented with complaints of weight loss and cough for more than 1 year. He also has hypercalcemia. His biopsy is shown below. Which of the following is the most likely cancer is this patient?



A Small cell cancer

B Squamous cell cancer

CORRECT

C Large cell neuro endocrine tumor

D Adenocarcinoma

RIGHT ANSWER

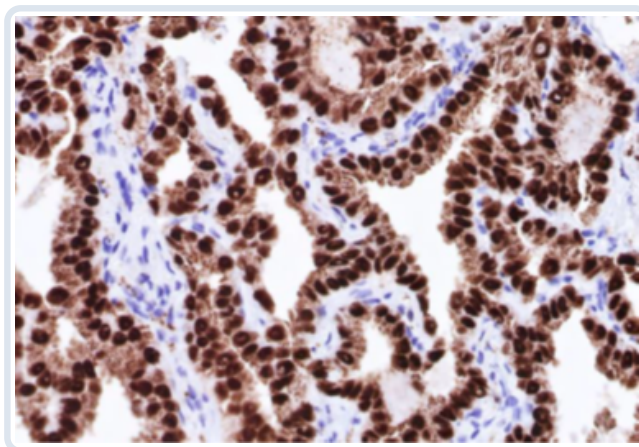
OK B. Squamous cell cancer

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1b" here and does not include a written explanation for this item.

QUESTION

A patient had a pulmonary mass which shows IHC staining with TTF-1 as shown in the image. What is the likely diagnosis in this patient?



A Squamous cell cancer lung

B Adenocarcinoma lung

CORRECT

C Small cell carcinoma lung

D Large cell carcinoma lung

RIGHT ANSWER

OK

B. Adenocarcinoma lung

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1c" here and does not include a written explanation for this item.

QUESTION

Which of the following is an intranuclear immuno-histochemistry marker for neuroendocrine tumor?

A Chromogranin

B NCAM

C Synaptophysin

D INSM

CORRECT

RIGHT ANSWER

OK
D. INSM

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1d" here and does not include a written explanation for this item.

QUESTION

A biopsy from a bronchial mass in a 55-year-old shows a neuroendocrine tumor. Which of the following statements regarding neuroendocrine tumors is incorrect?

- A Tumor cells show salt and pepper chromatin
- B Neuroendocrine tumors arising from different organs have identical microscopic features
- C Electron microscopy shows dense-core neurosecretory granules
- D Tumor cells may appear as small round blue cells forming rosettes

CORRECT

RIGHT ANSWER

- OK
- B. Neuroendocrine tumors arising from different organs have identical microscopic features**

WHY THIS IS RIGHT

Neuroendocrine tumors share common features like salt-and-pepper chromatin and neurosecretory granules, but their microscopic architecture varies by organ (e.g., lung, pancreas, GI tract).

They can show different patterns such as trabecular, insular, or rosette formation.

Hence, they are not identical across organs, making option B incorrect.

QUESTION

Regarding oat cell carcinoma of the lung, which of the following statement is or are correct?

1. It is strongly associated with cigarette smoking
2. It commonly presents as a peripheral lung mass
3. It shows early hematogenous metastasis
4. Paraneoplastic syndromes such as SIADH is most common
5. Surgical resection is the primary treatment modality

A 1,2,5

B 1,3,4

CORRECT

C 2,3,5

D 2,4,5

RIGHT ANSWER

OK

B. 1,3,4

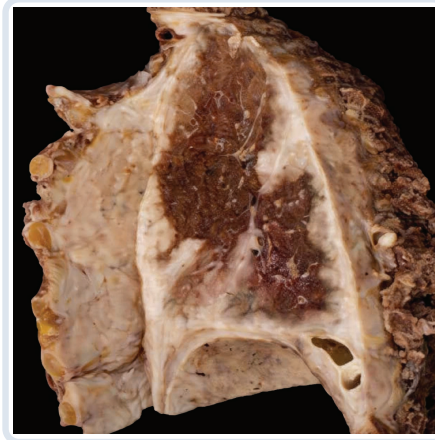
WHY THIS IS RIGHT

Small cell (oat cell) carcinoma of the lung is a highly aggressive neuroendocrine tumor strongly associated with cigarette smoking.

- Usually arises centrally near the hilum, not peripherally.
- Shows early hematogenous metastasis.
- Frequently causes paraneoplastic syndromes, especially SIADH (ectopic ADH) and ectopic ACTH.
- Surgery is rarely used because the tumor is usually metastatic at diagnosis; treatment is mainly chemotherapy and radiotherapy.

QUESTION

Which of the following viruses has been implicated in the development of following finding?



- A** Epstein-Barr virus
- B** Human papillomavirus (HPV)
- C** Simian virus 40 (SV40) CORRECT
- D** Human T-cell lymphotropic virus-1 (HTLV-1)

RIGHT ANSWER

OK C. Simian virus 40 (SV40)

WHY THIS IS RIGHT

Malignant mesothelioma is a tumor of the pleural mesothelial cells, most commonly associated with asbestos exposure.

Additional association:

The Simian virus 40 (SV40) has been implicated in mesothelioma by producing oncogenic proteins (large T antigen) that inactivate tumor suppressor genes such as p53 and Rb, promoting malignant transformation.

QUESTION

A patient expired as he has accidentally suffered from an unknown gas poisoning. He had cherry red appearance of his blood at the post-mortem finding. Which of the following is the likely cause of his death?

A Hypoxic hypoxia

B Histotoxic hypoxia

C Anemic hypoxia

CORRECT

D Ischemic hypoxia

RIGHT ANSWER

OK C. Anemic hypoxia

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$19” here and does not include a written explanation for this item.

QUESTION

What physiological change causes the oxygen-hemoglobin dissociation curve to shift to the left?

A Increased temperature

B Increased 2,3-BPG

C Decreased pH

D Decreased CO_2

CORRECT

RIGHT ANSWER

OK

D. Decreased CO_2

WHY THIS IS RIGHT

A left shift of the oxyhemoglobin dissociation curve occurs with decreased CO_2 , reflecting reduced hydrogen ion concentration (alkalosis).

This increases hemoglobin's affinity for oxygen, favoring oxygen loading in the lungs. In contrast, increased temperature, increased 2,3-BPG, and decreased pH cause a right shift.

QUESTION

A 40-year-old male presented to OPD with complaints of excessive daytime sleepiness, and his wife also complains that he snores a lot at night during sleep. Which of the following is incorrect regarding his condition?

CORRECT

A Increased tone of the pharyngeal muscles worsens obstruction

B Fall of oxygen saturation triggers waking episodes at night

C Episodes of apnea increase stress on the heart

D Hypoxemia stimulates respiratory effort

RIGHT ANSWER

OK A. Increased tone of the pharyngeal muscles worsens obstruction

WHY THIS IS RIGHT

Clues:

- Excessive daytime sleepiness
- Loud snoring

Classic for Obstructive Sleep Apnea (OSA)

Sleep

↓

↓ Pharyngeal muscle tone

↓

Airway collapse

↓

Apnea (no airflow)

↓

↓ Oxygen saturation

↓

Arousal from sleep

↓

Cycle repeats

Feature	OSA Mechanism
-----	-----
Muscle tone	↓ (causes obstruction)
Oxygen level	↓ (hypoxemia)
Arousal	Triggered by hypoxia
Cardiac effect	↑ Stress (HTN, arrhythmia)
Respiratory drive	↑ due to hypoxemia

OSA Risk Factors

Factor	Effect
-----	-----
Obesity	↑ airway narrowing
Large neck circumference	↑ obstruction
Alcohol	↓ muscle tone
Sedatives	↓ muscle tone

Treatment	Role
-----	-----
CPAP	First-line
Weight loss	Essential
Surgery	Selected cases

QUESTION

A preterm baby who was delivered at 28 weeks developed respiratory distress syndrome. Which of the following is true about surface tension and compliance in this baby?

A Surface tension - decreased; Compliance - increased

B Surface tension - increased; Compliance - decreased

CORRECT

C Both surface tension and compliance decreased

D Both surface tension and compliance increased

RIGHT ANSWER

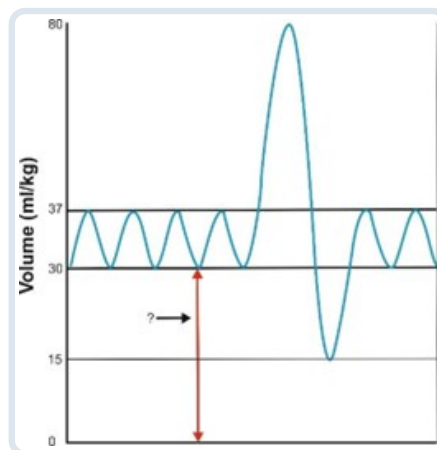
OK B. Surface tension - increased; Compliance - decreased

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1a” here and does not include a written explanation for this item.

QUESTION

Identify the marked area in the given spirometry graph?



A Functional residual capacity

CORRECT

B Tidal volume

C Expiratory reserve volume

D Expiratory capacity

RIGHT ANSWER

OK A. Functional residual capacity

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1b" here and does not include a written explanation for this item.

QUESTION

2, 3 BPG binds with which of the following?

- A Globin part of myoglobin
- B Globin part of hemoglobin**
- C Heme part of myoglobin
- D Heme part of hemoglobin

CORRECT

RIGHT ANSWER

- B. Globin part of hemoglobin**

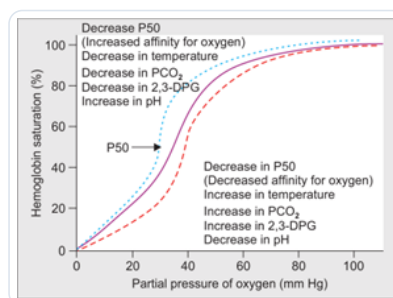
WHY THIS IS RIGHT

2,3-BPG binds to the globin chains of deoxyhemoglobin in the central cavity between the β -chains. This stabilizes the T (tense) state, reducing hemoglobin's affinity for oxygen and facilitating tissue oxygen delivery.

2,3-BPG produced in RBC glycolysis

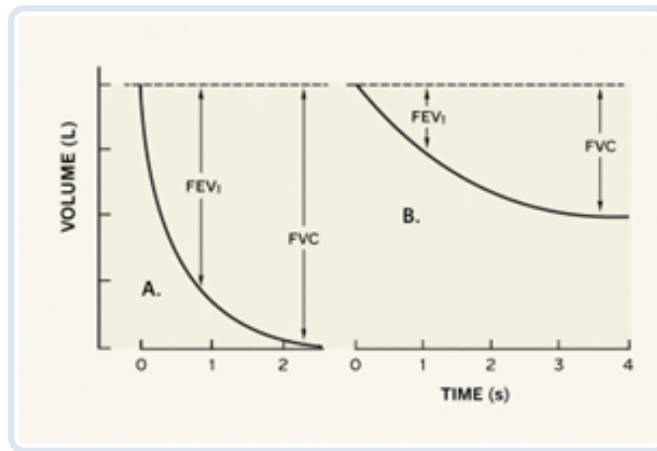
↓
Binds to deoxyhemoglobin (β -globin chains)
↓
Stabilizes T (tense) state of Hb
↓
↓ Affinity of Hb for O_2
↓
↑ Oxygen release to tissues
↓
Right shift of O_2 dissociation curve

It does not bind to the heme moiety or to myoglobin.



QUESTION

The graph given below shows the normal FEV₁ and FVC curves (A) for a normal lung and a diseased lung (B). The abnormal graph represents which of the following?



- A Bronchiectasis
- B Sarcoidosis
- C Pulmonary fibrosis

D COPD

CORRECT

RIGHT ANSWER

OK

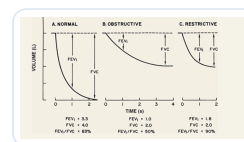
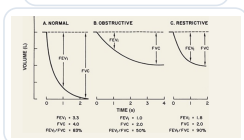
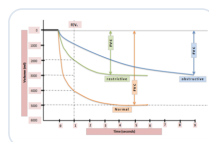
D. COPD

WHY THIS IS RIGHT

The abnormal curve shows reduced FEV₁ with a relatively preserved or less reduced FVC, causing a decreased FEV₁/FVC ratio, which is characteristic of obstructive lung disease.

There is a scooped-out expiratory limb due to airflow limitation and air trapping.

This pattern is typical of COPD, unlike restrictive diseases where both FEV₁ and FVC are proportionately reduced.



QUESTION

Peripheral chemoreceptors are most sensitive to which one of the following?

A CO₂

B Hypoxia

CORRECT

C Alkalosis

D Acidosis

RIGHT ANSWER

OK

B. Hypoxia

WHY THIS IS RIGHT

Located in:

- Carotid body (most important)
- Aortic body

They respond to:

- ↓ PaO₂ (primary stimulus)
- ↑ PaCO₂
- ↓ pH (acidosis)

Peripheral chemoreceptors in the carotid and aortic bodies are most sensitive to arterial hypoxemia (↓PaO₂), especially when PaO₂ falls below ~60 mmHg.

They respond rapidly to hypoxia and provide the primary ventilatory drive in low-oxygen states.

CO₂ and pH are mainly sensed by central chemoreceptors.

| Feature | Peripheral | Central |

| ----- | ----- | ----- |

| Location | Carotid & aortic bodies | Medulla |

| Primary stimulus | ↓ O₂ | ↑ CO₂ (via pH) |

| Speed | Rapid | Slower |

| Role in COPD | Important | Blunted |

QUESTION

| Which one of the following is correct about physiological dead space?

- A** It is less than anatomical dead space
- B** It can be measured by spirometry
- C** It is because of inadequate perfusion
- D** It is because of inadequate ventilation

CORRECT

RIGHT ANSWER

- OK** C. It is because of inadequate perfusion

WHY THIS IS RIGHT

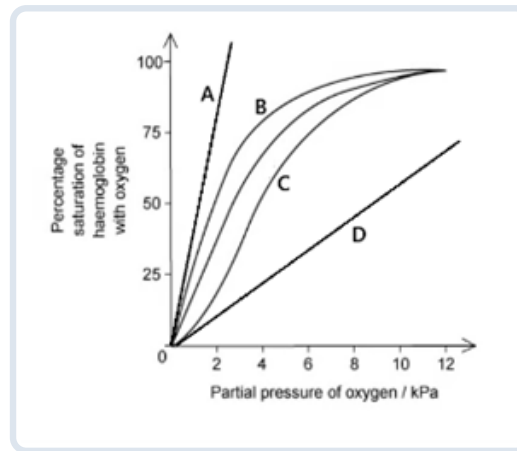
Type	Definition
Anatomical dead space	Conducting airways (no alveoli)
Alveolar dead space	Ventilated alveoli but no perfusion
Physiological dead space	Anatomical + alveolar dead space

Physiological dead space includes alveoli that are ventilated but not perfused, due to inadequate pulmonary blood flow. It equals anatomical dead space plus alveolar dead space and therefore is greater than or equal to anatomical dead space.
Spirometry measures volumes, not dead space, and inadequate ventilation cause shunt, not dead space.

Feature	Dead Space	Shunt
Ventilation	☐ Present	☐ Absent
Perfusion	☐ Absent	☐ Present
V/Q ratio	∞	0
Example	PE	Pneumonia

QUESTION

Which one of the following curves shows oxygen Hb dissociation after transfusion of stored blood?



A A

B B

CORRECT

C C

D D

RIGHT ANSWER

OK

B. B

WHY THIS IS RIGHT

When blood is stored:

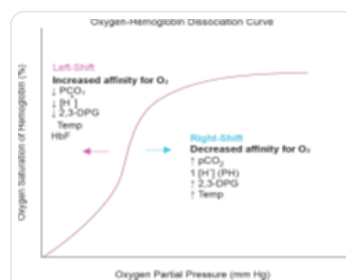
- 2,3-BPG levels fall (within days)
- RBC metabolism slows
- 2,3-BPG normally:
- ↓ Hb affinity for O₂
- Helps oxygen unloading in tissues

So when 2,3-BPG ↓:

- Hb holds onto O₂ tightly
- Less O₂ delivered to tissues
- Stored blood has reduced 2,3-DPG levels, which increases hemoglobin's affinity for oxygen.

This causes a left shift of the oxyhemoglobin dissociation curve, impairing oxygen release to tissues.

Curve B represents this moderate leftward shift seen after transfusion of stored blood.



QUESTION

A 42-year-old patient's pulmonary function test shows

FEV1/FVC = 0.62

FVC = 60%

RV/TLC = 142%

Which of the following best explains these findings?

A Restrictive

B Reduced compliance

C Air trapping

CORRECT

D Age-related

RIGHT ANSWER

OK
C. Air trapping

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1c" here and does not include a written explanation for this item.

QUESTION

| During which phase is the surface tension in the alveoli at its highest?

A Inspiration

CORRECT

B Expiration

C Standing from supine position

D Goes from standing to supine position

RIGHT ANSWER

OK

A. Inspiration

WHY THIS IS RIGHT

Alveoli are lined by fluid -> this creates surface tension, which:

- Tends to collapse alveoli
- Is counteracted by surfactant

Laplace Law

Where:

- P = collapsing pressure
- T = surface tension
- r = radius of alveolus

Alveolus size changes during breathing

↓

Inspiration -> alveolus expands (↑ radius)

↓

Surfactant spreads -> ↓ surface tension

↓

Expiration -> alveolus shrinks (↓ radius)

↓

Surfactant molecules crowd together

↓

Surface tension tends to increase

| Feature | Inspiration | Expiration |

| ----- | ----- | ----- |

| Alveolar size | ↑ | ↓ |

| Radius (r) | ↑ | ↓ |

| Surfactant spread | Diluted | Concentrated |

| Surface tension | ↓ | ↑ |

| Collapse tendency | Low | High |

$$P = \frac{2T}{r}$$

QUESTION

In a case of myasthenia gravis, repetitive nerve stimulation shows a decremental response. What is the rationale explaining this?

A Reduced ACh receptors on the postsynaptic membrane

CORRECT

B Depletion of ACh in the presynaptic vesicles

C Decreased amplitude of action potential

D Autoantibodies blocking Calcium entry in the presynaptic terminal

RIGHT ANSWER

OK

A. Reduced ACh receptors on the postsynaptic membrane

WHY THIS IS RIGHT

Myasthenia gravis is a postsynaptic disorder:

- Autoantibodies against:
- Nicotinic ACh receptors (Nm type)
- Result:
- ↓ number of functional receptors
- ↓ end-plate potential

Muscle fiber fails to reach threshold with repeated stimulation.

Feature	Myasthenia Gravis	Lambert-Eaton Syndrome
Site	Postsynaptic	Presynaptic
Antibody	ACh receptor	Voltage-gated Ca^{2+} channel
EMG response	□ Decremental	□ Incremental
Muscle strength	Worsens with use	Improves with use
Reflexes	Normal	Reduced
Association	Thymoma	Small cell lung cancer

QUESTION

A man is flying at an altitude of 3,400 meters and develops confusion, headache, and signs of cerebral edema. Which of the following mechanisms best explains the pathophysiology of high-altitude cerebral edema?

A Hypoxia causing cerebral vasodilation

CORRECT

B Metabolic acidosis leading to edema

C Hypoxia causing cerebral vasoconstriction

D High PCO₂ causing cerebral vasoconstriction

RIGHT ANSWER

OK

A. Hypoxia causing cerebral vasodilation

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

I In Decompression sickness, which one of the following is not seen?

- A** Hearing loss
- B** Hemodilution
- C** Thrombosis/Coagulopathy
- D** Visual disturbance

CORRECT

RIGHT ANSWER

OK B. Hemodilution

WHY THIS IS RIGHT

Decompression sickness results from nitrogen bubble formation causing vascular obstruction and endothelial injury. High pressure underwater

↓

↑ Nitrogen dissolved in tissues

↓

Rapid ascent

↓

↓ Pressure

↓

Nitrogen bubbles form

↓

Vascular obstruction + inflammation

↓

Ischemia + organ dysfunction

It produces neurologic deficits, hearing and visual disturbances, and can trigger thrombosis/coagulopathy due to intravascular bubble-induced activation.

Types of Decompression Sickness:

| Type | Feature |

| --- | ----- |

| Type I | Mild (joint pain, skin) |

| Type II | Severe (CNS, lungs, vestibular) |

Hemoconcentration, not hemodilution, is typically seen due to plasma leakage. Hence hemodilution is not a feature.

QUESTION

A 56-year-old man was diagnosed with COVID-19 and was put on mechanical ventilation. He passed away after a week. What is the likely post-mortem change seen in the lungs?

- A** Thick layer of fibrin lining the alveoli
- B** Acute and chronic alveolar hemorrhage
- C** Perivascular cuffing
- D** Pulmonary artery hypertrophy with increased resistance

CORRECT

RIGHT ANSWER

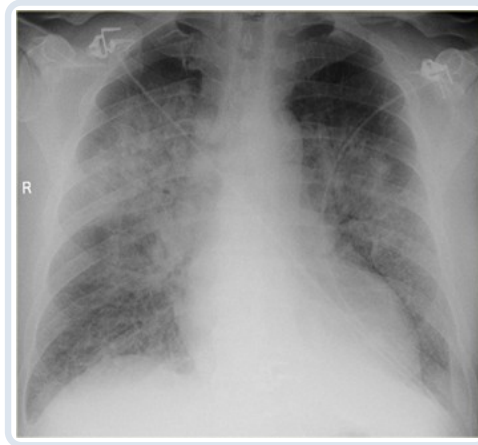
- OK**
- A. Thick layer of fibrin lining the alveoli**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1e” here and does not include a written explanation for this item.

QUESTION

A hypertensive patient who is non-compliant with medication presents to you with sudden onset breathlessness. A chest X-ray was done, which is shown below. How will you manage this patient?



- A Intravenous salbutamol
- B Intravenous nitroglycerin**
- C Nebulization with salbutamol
- D Oxygen and antibiotics

CORRECT

RIGHT ANSWER

- B. Intravenous nitroglycerin**

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1f" here and does not include a written explanation for this item.

QUESTION

A 44-year-old male presented with cough. Chest X-ray revealed pleural effusion. Thoracentesis was done, and the following was observed. Pleural fluid protein to serum protein ratio was 0.6. Which of the following is the likely diagnosis?

- A Cirrhosis
- B Congestive heart failure
- C Pleural TB
- D Nephrotic Syndrome

CORRECT

RIGHT ANSWER

OK
C. Pleural TB

WHY THIS IS RIGHT

A pleural fluid protein-to-serum protein ratio of 0.6 fulfills Light's criteria for an exudative effusion.

Tuberculous pleural effusion is classically exudative, with high protein content due to increased capillary permeability.

Cirrhosis, CHF, and nephrotic syndrome cause transudative effusions with low protein ratios.

Feature	Exudate	Transudate
Protein ratio	>0.5	<0.5
LDH	High	Low
Cause	Inflammation	Pressure imbalance
Example	TB, malignancy	CHF, cirrhosis

QUESTION

A 44-year-old female who is a known case of scleroderma presented with shortness of breath, especially during exercise. She underwent right heart catheterization, and her mean pulmonary artery pressure (mPAP) was 35 mm Hg. Which of the following is true regarding her condition?

- A CCBs are the first line in all patients
- B Endothelin antagonists improve symptoms**
- C Lung transplant is the best treatment if identified early
- D Lifestyle modification

CORRECT

RIGHT ANSWER

- B. Endothelin antagonists improve symptoms**

WHY THIS IS RIGHT

Scleroderma with mPAP ≥ 25 mmHg indicates pulmonary arterial hypertension (PAH).

Endothelin receptor antagonists (e.g., bosentan, ambrisentan) reduce pulmonary vascular resistance and improve symptoms and exercise capacity.

| Option | Statement | When it is Correct | Why NOT Correct Here | Exam Pearl |

| ---- | - | - | - | - |

| A. CCBs are first line in all patients | Vasodilators | Only in vasoreactive patients | ☐ Not for all PAH patients | Do vasoreactivity testing first |

| B. Endothelin antagonists improve symptoms | ☒ | Block vasoconstriction | ☐ PAH (especially CTD-related) | ☐ Correct | First-line targeted therapy |

| C. Lung transplant is best early | Surgical option | End-stage disease | ☐ Not first-line | Reserved for refractory cases |

| D. Lifestyle modification | Supportive care | Mild disease adjunct | ☐ Not definitive therapy | Only supportive |

QUESTION

A 53-year-old male patient who is a known case of COPD developed breathlessness and is on mechanical ventilation. He suddenly developed hypoxia, and on examination, he has reduced/absent breath sounds on the left hemithorax with increased peak inspiratory pressure. What is the likely diagnosis?

A Acute Exacerbation

B Pulmonary Embolism

C Pneumothorax

CORRECT

D Pneumonia

RIGHT ANSWER

OK

C. Pneumothorax

WHY THIS IS RIGHT

Sudden hypoxia in a ventilated COPD patient with absent breath sounds on one side and increased peak inspiratory pressures is classic for acute pneumothorax, often tension pneumothorax.

COPD patients have fragile bullae that can rupture, especially under positive pressure ventilation.

Mechanical ventilation (positive pressure)

↓
Alveolar overdistension
↓
Alveolar rupture
↓
Air leaks into pleural space
↓
Lung collapse
↓
Breath sounds + ↑ airway pressure
↓
Sudden hypoxia

Pulmonary embolism does not cause unilateral absent breath sounds or raised airway pressures.

Finding	Likely Diagnosis
↑ Peak pressure + absent breath sounds	Pneumothorax
↑ Peak pressure + wheeze	Bronchospasm
Normal breath sounds + hypoxia	Pulmonary embolism
Fever + crackles	Pneumonia

QUESTION

A 43-year-old male presented with right-sided rib pain and shortness of breath. A chest X-ray showed a significant right-sided pneumothorax with cardio-mediastinal shift to the left. Which of the following changes will be seen?

- A** Increased lung volume, Increased thoracic volume
- B** Decreased lung volume, Increased thoracic volume
- C** Decreased lung volume, thoracic volume remains unaffected
- D** Lung volume remains unaffected, Decreased thoracic volume

CORRECT

RIGHT ANSWER

- OK** **B. Decreased lung volume, Increased thoracic volume**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$20” here and does not include a written explanation for this item.

QUESTION

A patient who had undergone knee replacement surgery 7 days back, now presents with complaints of sudden shortness of breath and tachycardia. What is the next appropriate diagnostic test?

- A** D Dimer
- B** Chest X-ray
- C** CT pulmonary angiography
- D** Ventilation/Perfusion scan

CORRECT

RIGHT ANSWER

- OK** C. CT pulmonary angiography

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$21” here and does not include a written explanation for this item.

QUESTION

| Inhaled NO is used in:

A Primary Pulmonary Artery Hypertension

CORRECT

B Obstructive Sleep Apnea

C Unstable Angina

D Erectile Dysfunction

RIGHT ANSWER

OK A. Primary Pulmonary Artery Hypertension

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$22" here and does not include a written explanation for this item.

QUESTION

A patient is diagnosed with pulmonary arterial hypertension (PAH). Which of the following drugs used in this condition act as prostacyclin receptor agonists?

1. Epoprostenol
2. Iloprost
3. Ambrisentan
4. Selexipag

A 1 and 2

B 1, 2, and 4

CORRECT

C 2, 3, and 4

D 1, 3, and 4

RIGHT ANSWER

OK

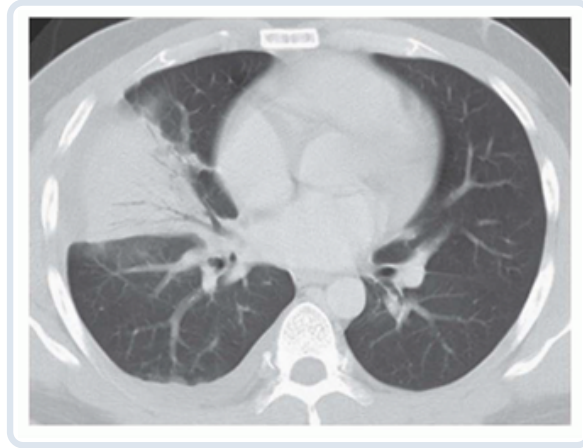
B. 1, 2, and 4

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$23” here and does not include a written explanation for this item.

QUESTION

A 35-year-old female patient presents to you with fever, breathlessness, and cough with expectoration. A CT scan was done which is shown below. What is the most likely diagnosis?



A Consolidation

CORRECT

B Mass

C Pleural effusion

D Diaphragmatic hernia

RIGHT ANSWER

OK
A. Consolidation

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$24" here and does not include a written explanation for this item.

QUESTION

A 45-year-old male presented with fever of 102°F with foul-smelling sputum for 5 days. On examination, clubbing was noted in the digits. Chest X-ray is shown below. What is the most likely diagnosis?

A Pneumatocele

B Empyema

C Pneumothorax

D Lung abscess

CORRECT

RIGHT ANSWER

OK
D. Lung abscess

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$25” here and does not include a written explanation for this item.

QUESTION

A 65-year-old male presented with fever, cough, and chest pain. Identify the lesion in the given Chest X-ray.

A Right upper lobe consolidation

CORRECT

B Right lung collapse

C Right upper lobe malignancy

D Right upper lobe abscess

RIGHT ANSWER

OK A. Right upper lobe consolidation

WHY THIS IS RIGHT

The chest X-ray shows homogeneous opacity in the right upper zone with preserved lung volume, consistent with lobar consolidation.

- Dense white opacity
- Preserved lung volume
- Air bronchograms

Acute symptoms of fever, cough, and pleuritic chest pain support an infective etiology.

Collapse would show volume loss with mediastinal shift, abscess shows cavitation with air-fluid level, and malignancy presents as a mass lesion.

Feature	Consolidation	Collapse	Abscess	Malignancy
Onset	Acute	Acute/subacute	Subacute	Chronic
Opacity	Homogeneous	Dense + volume loss	Cavity	Mass
Air bronchogram	☒ Present	☐ Absent	☐ Absent	Rare
Mediastinal shift	No	Toward lesion	No	Variable

QUESTION

A 65-year-old man was brought after a fall. He has a fever and confusion. On examination, he had a cough with rales. The patient was also tachypneic. How will you manage this patient?



- A** Admit and give IV levofloxacin
- B** Treat at home with oral Amoxicillin
- C** Admit and give IV ceftriaxone
- D** Admit and give IV ceftriaxone and IV levofloxacin

CORRECT

RIGHT ANSWER

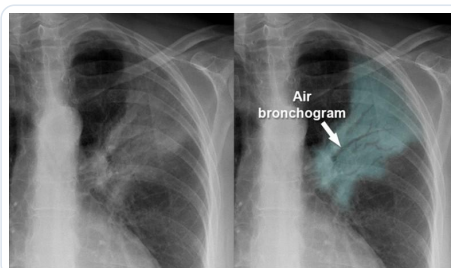
- OK** D. Admit and give IV ceftriaxone and IV levofloxacin

WHY THIS IS RIGHT

Apply CURB-65 Score:

Parameter	Present?
Confusion	☐
Urea >7	?
RR ≥30	Likely ☐
BP low	Not given
Age ≥65	☐

An elderly patient with fever, confusion, tachypnea, and rales indicates severe community-acquired pneumonia requiring hospital admission. Severe CAP warrants dual therapy with a β -lactam (ceftriaxone) plus a respiratory fluoroquinolone (levofloxacin) for broad coverage. Score ≥ 2 $\rightarrow$ Hospital admission required
Severe CAP $\rightarrow$ Broad-spectrum IV combination therapy



QUESTION

A 30-year-old patient presents with fever, cough, and tenacious white sputum. Which of the following should be used for treatment?

A Syrup Dextromethorphan with bromhexine

B Syrup Codeine

C Syrup Dextromethorphan

D Syrup Bromhexine

CORRECT

RIGHT ANSWER

OK D. Syrup Bromhexine

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$26" here and does not include a written explanation for this item.

QUESTION

A 46-year-old diabetic presented with fever, malaise, and cough. His chest X-ray is shown. Which of the following is correct?



- A** Lobar infiltrates - Pyogenic pneumonia
- B** Hilar infiltrates - Malignancy
- C** Interstitial infiltrates - Mycoplasma
- D** Aspiration pneumonia - Upper segment of right lower lobe

CORRECT

RIGHT ANSWER

- OK** C. Interstitial infiltrates - Mycoplasma

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$27" here and does not include a written explanation for this item.

QUESTION

A 30-year-old woman presents with weight loss, mediastinal lymphadenopathy, and pleural effusion. Her HRCT shows a "tree-in-bud" pattern, indicating lung consolidation and effusion. Analysis of pleural fluid reveals high adenosine deaminase (ADA) levels with a predominance of lymphocytes. What is the most likely finding on lymph node biopsy?

A Fungal hyphae surrounded by lymphocytes

B Anthracosis pigment

C Necrotizing epithelioid granuloma

CORRECT

D Reactive hyperplasia

RIGHT ANSWER

OK

C. Necrotizing epithelioid granuloma

WHY THIS IS RIGHT

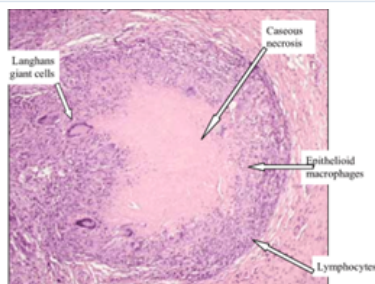
Solution

Clue	Interpretation
Weight loss	Chronic infection (-> TB, malignancy)
Mediastinal lymphadenopathy	TB / lymphoma
Pleural effusion + lymphocytes	TB until proven otherwise
High ADA in pleural fluid	Strong marker for TB
HRCT "tree-in-bud"	Endobronchial spread of infection -> classic for TB

So lymph node biopsy will show:

- ☐ Caseating (necrotizing) epithelioid granulomas
- ☐ Hallmark of Mycobacterium tuberculosis

Feature	TB Effusion
Type	Exudative
Cells	Lymphocyte predominant
ADA	↑↑ (>40 IU/L highly suggestive)
Protein	High
Glucose	Low-normal
Mechanism	Delayed hypersensitivity



QUESTION

Which of the following is considered ineffective in the prevention of COVID-19?

- A Mask
- B Vaccine
- C Ivermectin
- D Cough etiquette

CORRECT

RIGHT ANSWER

OK C. Ivermectin

WHY THIS IS RIGHT

COVID-19:

Prevention works by:

- Blocking transmission
- Building immunity
- Reducing viral spread

Level	Method
Primary prevention	Vaccination
Barrier protection	Mask
Behavioral	Cough etiquette
Not effective	Ivermectin

Effective	Not Effective
Mask	Ivermectin
Vaccination	Hydroxychloroquine (prophylaxis - outdated)
Hand hygiene	
Cough etiquette	
• In vitro antiviral activity ≠ clinical benefit
• Required doses in lab:
• Much higher than safe human dose

No real-world effectiveness

QUESTION

A 65-year-old known case of Parkinson's disease presents with severe oropharyngeal dysphagia and recurrent episodes of aspiration pneumonitis. CXR reveals bilateral bronchiectasis. What is the most appropriate long-term management plan for this patient?

- A** High-frequency chest wall oscillation therapy
- B** Nebulized N-acetylcysteine to reduce secretions
- C** PEG tube
- D** Macrolide therapy

CORRECT

RIGHT ANSWER

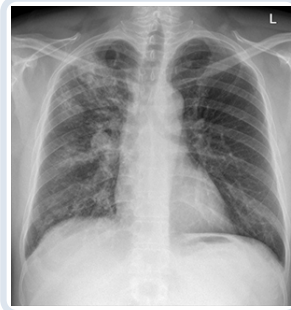
OK
C. PEG tube

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$28” here and does not include a written explanation for this item.

QUESTION

A 36-year-old PLHIV presents with occasional fever, productive cough, and haemoptysis for 3 months. The chest X-ray is shown below. Which of the following is the most likely cause of his condition?



A Aspergillosis

B Lung abscess

C Tuberculosis

CORRECT

D Metastases

RIGHT ANSWER

OK

C. Tuberculosis

WHY THIS IS RIGHT

A 36-year-old PLHIV (Person Living with HIV) with:

- Chronic symptoms (3 months)
- Fever
- Productive cough
- Hemoptysis

This classic triad strongly points toward Pulmonary tuberculosis.

Inhalation of *Mycobacterium tuberculosis*

Alveolar macrophage infection

Cell-mediated immunity activation (Th1)

Granuloma formation

Caseous necrosis

Cavitation (especially in upper lobes)

Hemoptysis + chronic cough

| CD4 Count | TB Pattern |

| ----- | ----- |

| >200 | Typical cavitary TB |

| <200 | Atypical (lower lobe, diffuse, no cavitation) |

| <50 | Disseminated TB |

QUESTION

Which of the following has the highest risk of causing invasive pulmonary aspergillosis?

A Febrile neutropenia

CORRECT

B CD4 <50 cells/ μ L

C Severe protein-energy undernutrition

D Bronchial asthma

RIGHT ANSWER

OK A. Febrile neutropenia

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$29” here and does not include a written explanation for this item.

QUESTION

Benralizumab acts by targeting which of the following immune mediators or receptors?

A Anti-IgE

B Anti-IL-5 receptor

CORRECT

C Anti-IL-4 receptor

D Anti-IL-6 receptor

RIGHT ANSWER

OK

B. Anti-IL-5 receptor

WHY THIS IS RIGHT

Benralizumab is a monoclonal antibody that targets the IL-5 receptor α on eosinophils.

It causes antibody-dependent cell-mediated cytotoxicity, leading to near-complete eosinophil depletion.

It is used in severe eosinophilic asthma unresponsive to standard therapy.

Contrast:

- Anti-IgE: Omalizumab
- Anti-IL-4 receptor: Dupilumab
- Anti-IL-6 receptor: Tocilizumab

QUESTION

A 24-year-old female with a history of severe persistent asthma is currently on inhaled corticosteroids (ICS) and long-acting beta-agonists (LABA). Despite adherence to therapy, she continues to have seasonal exacerbations. Her FEV1 is within normal limits. Laboratory investigations reveal elevated serum IgE levels. What is the most appropriate next step in management?

A Oral antibiotics and short-acting beta-agonists (SABA)

B Intravenous terbutaline

C Subcutaneous omalizumab

CORRECT

D Intravenous corticosteroids

RIGHT ANSWER

OK

C. Subcutaneous omalizumab

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$2a" here and does not include a written explanation for this item.

QUESTION

Theophylline was prescribed to a male patient with chronic obstructive pulmonary disease (COPD). The next day, he noticed that his urine output had increased. Which of the following receptors is responsible for the drug's action?

- A** Interleukin-10
- B** Histone deacetylase
- C** Adenosine A
- D** Beta 2 adrenergic receptors

CORRECT

RIGHT ANSWER

- OK** **C. Adenosine A**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$2b” here and does not include a written explanation for this item.

QUESTION

A 24-year-old male who is a known case of bronchial asthma presented for a routine follow-up. PFT was done earlier-his FEV1 was 70%, which improved to 83% after bronchodilator nebulization. He was already on MDI Albuterol daily. On questioning, it seems like he is being symptomatic for at least 2 times per week and is waking up in the nights due to symptoms at least once per week. On examination, there are scattered rhonchi. What should be done?

A Add Fluticasone MDI two times a day

CORRECT

B Shift to MDI Salmeterol two times a day

C Add Prednisolone 10mg

D Continue the current management

RIGHT ANSWER

OK

A. Add Fluticasone MDI two times a day

WHY THIS IS RIGHT

Symptoms ≥ 2 times/week with nighttime awakening indicate persistent asthma, despite SABA use.

PFT shows reversibility, confirming asthma with inadequate anti-inflammatory control.

The correct step-up is adding an inhaled corticosteroid (fluticasone) to treat airway inflammation.

Severity	Symptoms	Treatment
-----	-----	-----
Intermittent	<2/week	SABA
Mild persistent	≥ 2 /week	Low-dose ICS
Moderate persistent	Daily symptoms	ICS + LABA
Severe	Continuous	High-dose ICS + LABA

QUESTION

A patient with dyspnea, respiratory distress due to pan-acinar emphysema, and liver dysfunction is due to a likely defect in which of the following?

A ATP7A gene

B ATP7B gene

C Alpha 1 anti-trypsin deficiency

CORRECT

D Surfactant defect

RIGHT ANSWER

OK

C. Alpha 1 anti-trypsin deficiency

WHY THIS IS RIGHT

Pan-acinar emphysema with early-onset dyspnea and liver dysfunction is classic for α_1 -antitrypsin deficiency.

Loss of α_1 -antitrypsin leads to unopposed neutrophil elastase activity, causing diffuse alveolar destruction, predominantly in lower lobes.

Misfolded protein accumulation in hepatocytes explains the associated liver disease.

Normal:

Neutrophils → Elastase (destroys elastin)

↓ Alpha-1 antitrypsin

↓

Unopposed elastase activity

↓

Alveolar wall destruction

↓

Pan-acinar emphysema

| Type | Cause | Location |

| --- | ---- | - |

| Pan-acinar | A1AT deficiency | Lower lobes |

| Centriacinar | Smoking | Upper lobes |

| Paraseptal | Subpleural | Risk of pneumothorax |

QUESTION

A female patient with a known case of bronchial asthma is on levosalbutamol and Ipratropium bromide metered-dose inhalers. She now reports frequent nocturnal symptoms, including wheezing and breathlessness that wake her up several times a week. What is the most appropriate next step in management?

A Increase dose of Salbutamol nebulization

B Add Corticosteroids orally

C Add LABA and inhaled corticosteroid (ICS)

CORRECT

D Add Montelukast

RIGHT ANSWER

OK

C. Add LABA and inhaled corticosteroid (ICS)

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$2c" here and does not include a written explanation for this item.

QUESTION

A man with a history of COPD presents with an acute exacerbation. His vitals are given below. According to GOLD criteria, which of the following is/are used in the management of this case?

RR - 30/min, Pulse - 112/min, SpO₂ - 87% under RA, pCO₂ - 60 mmHg

1. Antibiotics
2. Steroids
3. Antivirals
4. Nebulised bronchodilators

A 1, 2 and 3

B 1, 2 and 4

CORRECT

C 2, 3 and 4

D 1 and 4

RIGHT ANSWER

OK B. 1, 2 and 4

WHY THIS IS RIGHT

- RR: 30/min -> Tachypnea
- Pulse: 112/min -> Distress
- SpO₂: 87% (room air) -> Hypoxemia
- pCO₂: 60 mmHg -> Hypercapnia

This is acute exacerbation of COPD (AECOPD) with Type II respiratory failure.

Rx: Bronchodilators Steroids Antibiotics (if infection)

Oxygen (target SpO₂ 88-92%)

If CO₂ retention -> NIV (BiPAP)

Treatment	Role	Indication
Nebulised bronchodilators	Relieve bronchospasm	ALL patients
Systemic steroids	Reduce inflammation	Moderate-severe
Antibiotics	If infection suspected	Purulent sputum / severe
Oxygen	Correct hypoxemia	Target 88-92%
NIV (BiPAP)	↓ CO ₂	Hypercapnia

QUESTION

In a COPD patient what is the critical value of FEV1 for patients to develop resting hypoxemia?

A 50%

B 20%

C 30%

CORRECT

D 40%

RIGHT ANSWER

OK

C. 30%

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$2d” here and does not include a written explanation for this item.

QUESTION

Which of the following is not seen with the use of inhaled β_2 -adrenergic agonists?

A Hyperkalemia

CORRECT

B Tremor

C Palpitation

D Pulmonary vasodilation

RIGHT ANSWER

OK

A. Hyperkalemia

WHY THIS IS RIGHT

Drugs like Salbutamol and Formoterol are bronchodilators acting via:

Mechanism

- Stimulate β_2 receptors (Gs protein)
- $\uparrow$ Adenyl cyclase $\rightarrow \uparrow$ cAMP
- Smooth muscle relaxation $\rightarrow$ bronchodilation

- 1) Bronchial smooth muscle relaxation $\rightarrow$ Bronchodilation
 - 2) Skeletal muscle stimulation $\rightarrow$ Tremors
 - 3) Cardiac β_1 spillover $\rightarrow$ Palpitations
 - 4) $\uparrow$ Na^+/K^+ ATPase activity
- K^+ shifts into cells
Hypokalemia

QUESTION

A patient with chronic productive cough and progressive breathlessness is diagnosed with COPD. He develops type II respiratory failure. Which of the following statements regarding his condition is not true?

A Bronchial wall inflammation is a characteristic finding

B Increased Reid index

C Lung compliance is decreased

CORRECT

D FEV₁/FVC ratio is <70%

RIGHT ANSWER

OK

C. Lung compliance is decreased

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$2e” here and does not include a written explanation for this item.

QUESTION

| Which of the following statements about Ciclesonide is incorrect?

A Oral candidiasis is common with its use

CORRECT

B It has fewer side effects than other inhalational corticosteroids.

C It is a prodrug activated by bronchial esterase.

D It has comparable efficacy to other inhalational corticosteroids.

RIGHT ANSWER

OK

A. Oral candidiasis is common with its use

WHY THIS IS RIGHT

Ciclesonide

A clever inhaled corticosteroid that behaves like a “stealth prodrug”-> Active only in the lungs

Ciclesonide is an inhaled corticosteroid prodrug activated in the lungs by bronchial esterases. Because activation occurs locally, oropharyngeal deposition is minimal and oral candidiasis is uncommon. It has fewer systemic and local side effects while maintaining efficacy comparable to other inhaled steroids. Hence stating candidiasis is common is incorrect.

Feature	Ciclesonide	Other ICS
-----	-----	-----
Prodrug	☐ Yes ☐ No	
Activation	Lung only	Everywhere
Oral candidiasis	↓ Low ↑ Higher	
Systemic effects	↓ Minimal ↑ More	

QUESTION

A patient presents with progressive shortness of breath for the last 6 months, accompanied by dry cough. Auscultation reveals bilateral basal end-inspiratory crepitations. There is no history of fever, joint pain, or occupational exposure. What is the diagnosis?



- A** Cor-pulmonale
- B** Sarcoidosis
- C** Idiopathic pulmonary fibrosis
- D** Hypersensitivity pneumonitis

CORRECT

RIGHT ANSWER

OK C. Idiopathic pulmonary fibrosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$2f” here and does not include a written explanation for this item.

QUESTION

A worker employed in a cement factory presented with shortness of breath and was diagnosed with mesothelioma. Which of the following is the most likely risk factor responsible for this condition?

A Silica dust

B Metastasis

C Tuberculosis

D Asbestos

CORRECT

RIGHT ANSWER

OK D. Asbestos

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$30” here and does not include a written explanation for this item.

QUESTION

A mason working in a stone factory in Kota, Rajasthan, presented with complaints of dry cough and shortness of breath. Chest X-ray revealed eggshell calcification, as shown in the image below. Which of the following conditions is he most likely suffering from?



A Asbestosis

B Bagassosis

C Silicosis

CORRECT

D Anthracosis

RIGHT ANSWER

OK C. Silicosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$31” here and does not include a written explanation for this item.

QUESTION

A patient presents to you with fever, night sweats, ptosis, and bilateral facial nerve palsy. Investigations showed leukocytosis and bilateral hilar lymphadenopathy. Which of the following is the most likely diagnosis?

A Sarcoidosis

CORRECT

B Tuberculosis

C Lymphoma

D Hypersensitive pneumonitis

RIGHT ANSWER

OK
A. Sarcoidosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$32” here and does not include a written explanation for this item.

QUESTION

A middle aged cement factory worker has developed mesothelioma. This is likely to be associated with

- A Silicosis
- B Asbestosis**
- C Anthracosis
- D Byssinosis

CORRECT

RIGHT ANSWER

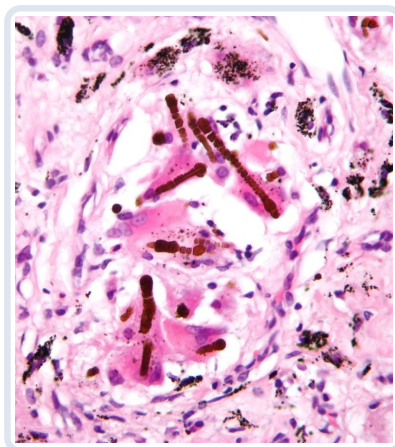
- B. Asbestosis**

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$19” here and does not include a written explanation for this item.

QUESTION

A worker in an industry for the last 20 years develops dry cough and chest tightness. He had the following finding in his pulmonary biopsy. What is the likely diagnosis?



- A** Silicosis
- B** Anthracosis
- C** Berylliosis

D Asbestosis

CORRECT

RIGHT ANSWER

OK D. Asbestosis

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1a" here and does not include a written explanation for this item.

QUESTION

Patient presents with cough, stridor, and dyspnea. On examination, there was lymphadenopathy. Histopathological examination of the lymph node shows granulomas with giant cells and stellate concretions. Which of the following is the most likely diagnosis?

A Hypersensitivity pneumonitis

B Churg Strauss syndrome

C Tuberculosis

D Sarcoidosis

CORRECT

RIGHT ANSWER

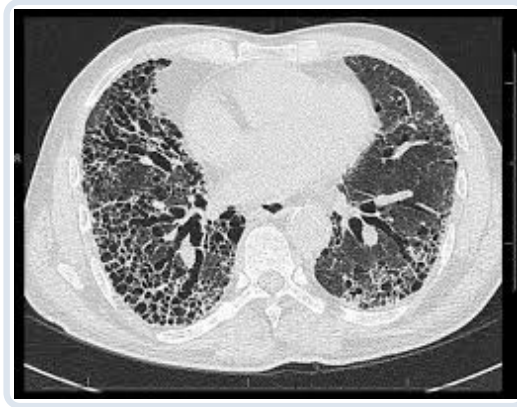
OK D. Sarcoidosis

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1b” here and does not include a written explanation for this item.

QUESTION

A 48-year-old woman presents with progressive shortness of breath and a dry cough for the past 6 months. HRCT chest is given below. All of the following are true about this condition except.



A End inspiratory coarse crackles are heard

CORRECT

B Honeycombing with reticular markings is visible on HRCT

C Both pneumococcal and influenza vaccines are advised for such patients

D Rheumatoid arthritis is associated with this condition

RIGHT ANSWER

OK

A. End inspiratory coarse crackles are heard

WHY THIS IS RIGHT

A 48-year-old with:

- Progressive dyspnea
- Dry cough
- HRCT: honeycombing + reticular opacities

Idiopathic pulmonary fibrosis (a prototype ILD)

HRCT of the lungs showing the classical UIP pattern: honeycomb transformation

Classic Imaging:

- Subpleural + basal predominance
- Honeycombing (clustered cystic air spaces)
- Reticular pattern
- Traction bronchiectasis

| Type of Crackles | Disease |

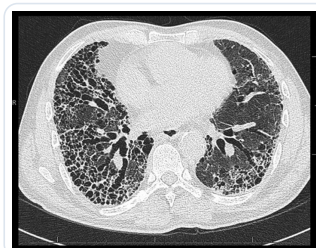
| ----- | ----- |

| Fine ("Velcro") | ILD, pulmonary fibrosis |

| Coarse | Bronchiectasis, pneumonia |

| Late inspiratory | Fibrosis |

| Early inspiratory | COPD |



QUESTION

A chronic smoker presents with cough and weight loss. Chest X-ray reveals a lung mass, and biopsy demonstrates chromogranin and synaptophysin positivity. Which of the following paraneoplastic syndromes is most likely associated with this condition?

A Hypercalcemia

B SIADH

CORRECT

C Gynecomastia

D Clubbing

RIGHT ANSWER

OK B. SIADH

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1c” here and does not include a written explanation for this item.

QUESTION

A 65-year-old chronic smoker came to the medicine outpatient department with complaints of upper chest discomfort and drooping of an eyelid. He also complained of pain radiating to the upper arm and a tingling sensation in the 4th and 5th digits of his left hand. The chest X-ray is given below. What is the most likely diagnosis?



A Pancoast tumor

CORRECT

B Upper lobe pneumonia

C Superior vena cava obstruction

D Aspergilloma

RIGHT ANSWER

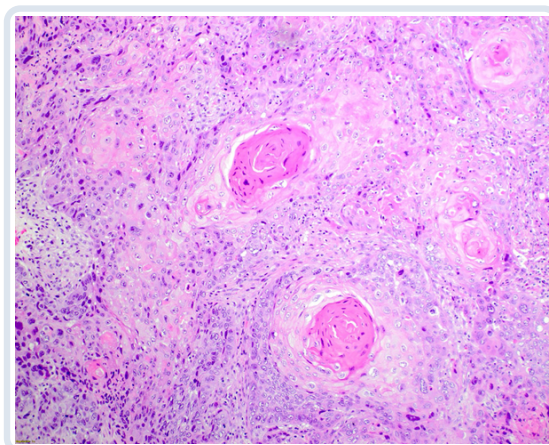
OK A. Pancoast tumor

WHY THIS IS RIGHT

The source quiz contains the placeholder “\$1d” here and does not include a written explanation for this item.

QUESTION

A 56-year-old chronic smoker presented with complaints of weight loss and cough for more than 1 year. He also has hypercalcemia. His biopsy is shown below. Which of the following is the most likely cancer is this patient?



A Small cell cancer

B Squamous cell cancer

CORRECT

C Large cell neuro endocrine tumor

D Adenocarcinoma

RIGHT ANSWER

OK

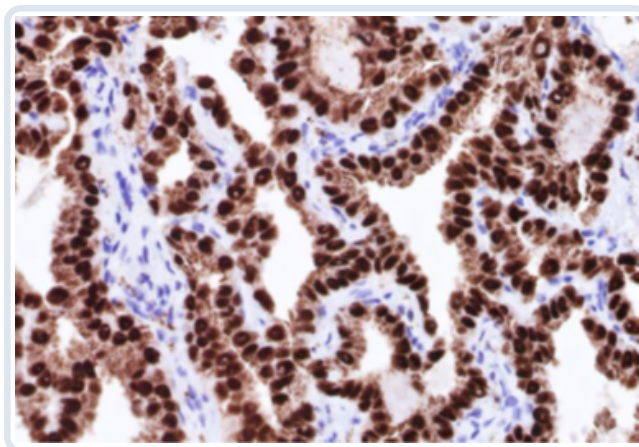
B. Squamous cell cancer

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1e" here and does not include a written explanation for this item.

QUESTION

A patient had a pulmonary mass which shows IHC staining with TTF-1 as shown in the image. What is the likely diagnosis in this patient?



A Squamous cell cancer lung

B Adenocarcinoma lung

CORRECT

C Small cell carcinoma lung

D Large cell carcinoma lung

RIGHT ANSWER

OK

B. Adenocarcinoma lung

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$1f" here and does not include a written explanation for this item.

QUESTION

Which of the following is an intranuclear immuno-histochemistry marker for neuroendocrine tumor?

A Chromogranin

B NCAM

C Synaptophysin

D INSM

CORRECT

RIGHT ANSWER

OK
D. INSM

WHY THIS IS RIGHT

The source quiz contains the placeholder "\$20" here and does not include a written explanation for this item.

QUESTION

A biopsy from a bronchial mass in a 55-year-old shows a neuroendocrine tumor. Which of the following statements regarding neuroendocrine tumors is incorrect?

- A Tumor cells show salt and pepper chromatin
- B Neuroendocrine tumors arising from different organs have identical microscopic features
- C Electron microscopy shows dense-core neurosecretory granules
- D Tumor cells may appear as small round blue cells forming rosettes

CORRECT

RIGHT ANSWER

- OK B. Neuroendocrine tumors arising from different organs have identical microscopic features

WHY THIS IS RIGHT

Neuroendocrine tumors share common features like salt-and-pepper chromatin and neurosecretory granules, but their microscopic architecture varies by organ (e.g., lung, pancreas, GI tract).

They can show different patterns such as trabecular, insular, or rosette formation.

Hence, they are not identical across organs, making option B incorrect.