

**Done by: Suhaib
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Clinical cases

Directions: Each of the numbered items or incomplete statements or completions of the statement. Select the ONE lettered choice that is the best answer.

1. An 8 year old boy is brought to your office by his mother. He has had a slight fever and a sore throat for the past 2 days. He has eight ulcerative lesions in his mouth, three vesicular lesions on his left hand, and five similar lesions on his right foot. The most probable cause of his disease is

- (A) Coxsackie A virus
- (B) Human herpes virus 6
- (C) Herpes simplex virus
- (D) Human papillomavirus

2. A 16-year-old boy presents at your office with a sore throat, fever, and enlarged lymph nodes.

(C)
(D)

5. The clinician has three patients who are all presenting with the same symptoms. The symptoms are

(A)
(B)
(C)
(D)

(D) Human papillomavirus

2. A 16-year-old boy presents at your office with a sore throat, fever, and enlarged lymph nodes. His tonsils are enlarged, the pharynx is inflamed, and splenomegaly is observed. He complains of severe fatigue. Confirmation of the causative agent is best done by observing

- (A) A positive Tzanck smear
- (B) IgM heterophile antibodies**
- (C) Koilocytotic cells
- (D) RT-PCR for enterovirus

3. The most common cause of congenital infections is

(D) Yellow fever virus

5. A 4 year old girl is brought to your rural clinic office by her mother who states the child has a runny nose, barking cough, and a sore throat. Your examination indicates respiration is labored. None of her three siblings is sick. The most probable viral cause of her symptoms is

(A) Adenovirus

(B) Influenza virus

(C) Parainfluenza virus

(D) Respiratory syncytial virus

6. The individual most likely to develop chronic

11. On September 17, a 22-year-old male college student appears at the Student Health Clinic complaining of moderate headache, nausea, and vomiting. His temperature is $38.5^{\circ}\text{C}/101^{\circ}\text{F}$ and his physical examination shows stiffness in the neck. What is the most likely viral cause of the symptoms?

- (A) Cytomegalovirus
- (B) Enterovirus**
- (C) Epstein-Barr virus
- (D) Herpes simplex virus type 1

12. Knowing the genotype of the coxsackievirus

(E) *Anaplasma phagocytophila*

3. A 3 year old presents with difficulty breathing and will not lie down to be examined. You suspect acute bacterial epiglottitis and examine the child's epiglottis, which is highly inflamed.

Which vaccine are you most likely to find that the child is missing?

(A) Diphtheria

(B) *Neisseria meningitidis*

(C) Polio

(D) *Streptococcus pneumoniae* (conjugate vaccine)

(E) *Haemophilus influenzae*

4. A 22-year-old cystic fibrosis patient presents

6. A 36-year-old immigrant who lived in a crowded resettlement camp before coming to the United States now has a cough that has been bothering him for several weeks. He has also lost 10 pounds. Which of the following factors is known to be most important in triggering the granulomatous reaction to wall off and contain the infection?

- (A)** Cord factor
- (B)** Mycolic acid
- (C)** Purified protein derivative (PPD)
- (D)** Sulfatides
- (E)** Wax D

(D) O antigens

17. A 54-year-old man develops a pyogenic infection along the suture line after knee surgery. The laboratory gives a preliminary report of a beta-hemolytic, catalase-positive, coagulase-positive, Gram-positive coccus. The most likely causative agent is

- (A) *Moraxella catarrhalis*
- (B) *Staphylococcus aureus***
- (C) *Staphylococcus epidermidis*
- (D) *Streptococcus agalactiae*
- (E) *Streptococcus pyogenes*

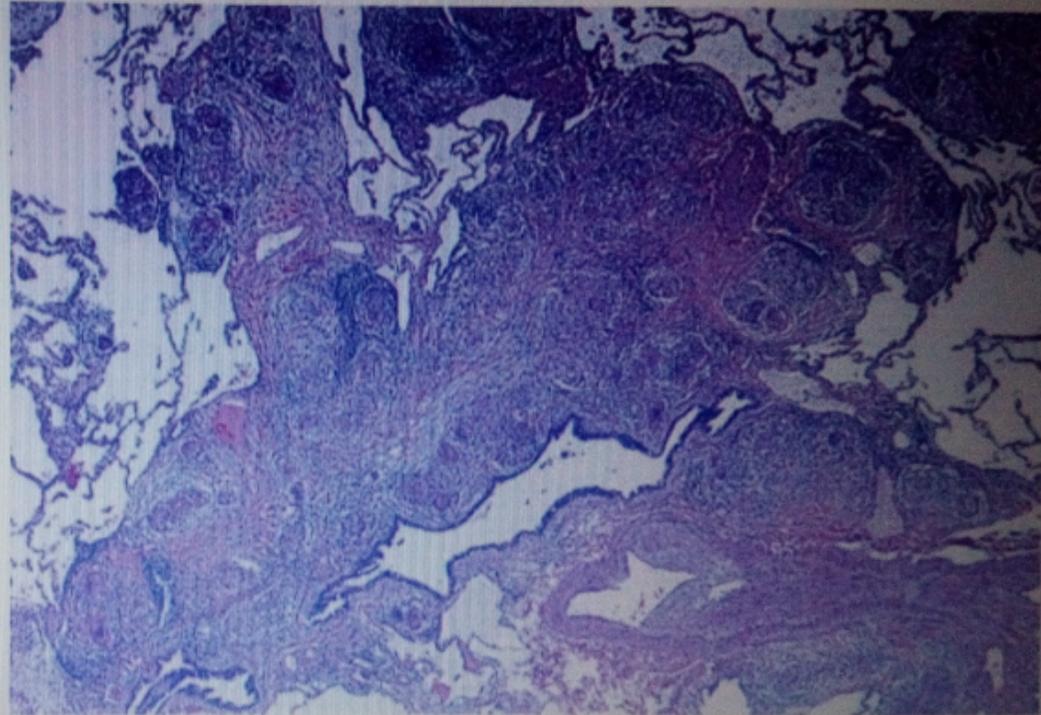
1. A 3-year-old girl presents to the emergency department with fever, hoarseness, a “seal bark-like” cough, and inspiratory stridor. Her father states that she has had a cold for the past few days, with runny nose, nasal congestion, sore throat, and cough. He is now concerned because her cough has become loud, harsh, and brassy. Which of the following is the most likely cause of her ailment?

- (A) Fungus
- (B) Gram-negative bacteria
- (C) Gram-positive bacteria
- (D) Parasite
- (E) **Virus**

2. A 60-year-old man, a heavy smoker, presents for advice to stop smoking. On physical examination, he is thin and has a ruddy complexion. He has a productive cough and a barrel-shaped chest. He sits leaning forward with his lips pursed to facilitate his breathing. A diagnosis of emphysema is made. Which of the following is the most likely histologic finding in the lungs?

- (A) Bronchial smooth muscle hypertrophy with proliferation of eosinophils
- (B) Diffuse alveolar damage with leakage of protein-rich fluid into alveolar spaces
- (C) Dilation of air spaces with destruction of alveolar walls**
- (D) Hyperplasia of bronchial mucus-secreting submucosal glands
- (E) Permanent bronchial dilation caused by chronic infection, with bronchi filled with mucus and neutrophils

5. A 23-year-old man presents with radiographic evidence of bilateral hilar lymphadenopathy and interstitial lung disease. A lung biopsy gives findings similar to those shown in the figure. A major characteristic of this disorder is



(Reprinted with permission from Rubin R, Strayer D, et al., eds.: *Rubin's Pathology. Clinicopathologic Foundations of Medicine*, 6th ed. Baltimore, Lippincott Williams & Wilkins, 2012, figure 12-61A, p. 582.)

- (A) a positive test for tuberculin.
 - (B) highest incidence in persons of Asian lineage.
 - (C) hypercalcemia.
 - (D) hypogammaglobulinemia.
 - (E) involvement restricted to the lung.
- (D) The capsular polysaccharides of *S. pneumoniae* have limited hapten potential.
 - (E) The surface carbohydrate capsule on the surface of the organism acts as an opsonin, facilitating phagocytosis by neutrophils, thus preventing immunization.

6. An 80-year-old woman, a retirement home resident, has multiple bouts of pneumonia caused by *Streptococcus pneumoniae*. In an attempt to prevent such infections, polyvalent vaccines directed at multiple serotypes of the organism have been administered but have not elicited long-acting immunity. Which of the following is the probable explanation for this phenomenon?

- (A) Memory T lymphocytes respond poorly to polysaccharide antigens.
- (B) *S. pneumoniae* evades host immune response by forming capsular coatings composed of host proteins and recognized as “self” antigens.
- (C) The bacterial capsule binds C3b, facilitating activation of the alternative complement pathway, inducing complement-mediated lysis, and preventing immunization.

7. A 50-year-old man dies of a respiratory illness that had been characterized by dyspnea, cough, and wheezing expiration of many years' duration. Initially episodic, his “attacks” had increased in frequency and at the time of death had become continuous and intractable. At autopsy, which of the following is the most likely histologic finding in the lungs?

- (A) Bronchial smooth muscle hypertrophy with proliferation of eosinophils
- (B) Diffuse alveolar damage with leakage of protein-rich fluid into alveolar spaces
- (C) Dilation of air spaces with destruction of alveolar walls
- (D) Hyperplasia of bronchial mucus-secreting submucosal glands
- (E) Permanent bronchial dilation caused by chronic infection, with bronchi filled with mucus and neutrophils

8. A 25-year-old man presents with a progressive illness of several days' duration characterized by nonproductive cough, fever, and malaise. A lateral view chest radiograph reveals platelike atelectasis. Elevated titers of cold agglutinins are detected. Which of the following is the most likely type of pneumonia in this patient?

- (A) Bacterial pneumonia, most likely caused by *S. pneumoniae*
- (B) Hospital-acquired pneumonia, most likely caused by *P. aeruginosa*
- (C) Interstitial pneumonia, most likely caused by *M. pneumoniae***
- (D) *P. jiroveci* (*carinii*) pneumonia, most likely related to an immunocompromised state
- (E) Viral pneumonia, most likely caused by influenza virus

9. A 60-year-old man presents with fever and chills, productive cough with rusty sputum, pleuritic pain, and shortness of breath for the past several days. A complete blood count reveals neutrophilia and an increase in band neutrophils. A chest radiograph reveals consolidation involving the entire left lower lobe. Which of the following microorganisms is the most likely etiologic agent?

- (A) *Hemophilus influenzae*
- (B) *Klebsiella pneumoniae*
- (C) *Staphylococcus aureus*
- (D) *Streptococcus pneumoniae*
- (E) *Streptococcus pyogenes*

11. A 25-year-old African-American woman presents with fatigue, dyspnea, nonproductive cough, and chest pain. She does not smoke. A chest radiograph reveals prominent bilateral hilar lymphadenopathy (“potato nodules”) and diffuse reticular densities in the interstitium of the lung. Laboratory studies reveal polyclonal hypergammaglobulinemia, hypercalcemia, and increased serum angiotensin-converting enzyme. Which of the following is the most likely diagnosis?

- (A) Acute respiratory distress syndrome
- (B) Adenocarcinoma of the lung
- (C) Eosinophilic granuloma
- (D) Idiopathic pulmonary fibrosis
- (E) **Sarcoidosis**

12. A 60-year-old man presents with dyspnea on exertion and a nonproductive cough. He has never smoked, but he worked as a shipbuilder, with known asbestos exposure approximately 20 years ago. To which of the following conditions is this patient especially predisposed?

- (A) Acute respiratory distress syndrome
- (B) Goodpasture syndrome
- (C) Idiopathic pulmonary fibrosis
- (D) Idiopathic pulmonary hemosiderosis
- (E) Malignant mesothelioma of the pleura

13. A female infant is born prematurely at 28 weeks' gestation. Shortly after birth, she shows signs of dyspnea, cyanosis, and tachypnea. She is placed on a ventilator for assisted breathing, and a diagnosis of neonatal respiratory distress syndrome (hyaline membrane disease) is made. Which of the following is the cause of this syndrome?

- (A) Bronchopulmonary dysplasia
- (B) Intraventricular brain hemorrhage
- (C) Lack of fetal pulmonary maturity and deficiency of surfactant
- (D) Necrotizing enterocolitis
- (E) Patent ductus arteriosus

14. A 50-year-old woman has been immobilized in bed for several days after a motor vehicle accident. She had been improving, but this morning she suffered the sudden onset of pleuritic chest pain, hemoptysis, tachypnea, tachycardia, and dyspnea. What is the likely basis of this set of findings?

- (A) Arterial thrombus originating in pulmonary blood vessels
- (B) Arterial thrombus originating in the lower extremities with migration to pulmonary veins
- (C) Deep venous thrombus of the lower extremities with embolization to branches of the pulmonary artery**
- (D) Mural thrombus originating in the left heart with migration to pulmonary blood vessels
- (E) Venous thrombus originating in pulmonary blood vessels

16. A 50-year-old woman has been immobilized in bed for several days after a motor vehicle accident. She had been improving, but this morning she suffered the sudden onset of pleuritic chest pain, hemoptysis, tachypnea, tachycardia, and dyspnea. What is the likely basis of this set of findings?

- (A) Synovial cyst
- (B) Proximal major artery
- (C) Excyst of e
- (D) Poo hon
- (E) Symptic

17. A 45-

15. The chest radiograph of a 23-year-old medical student reveals a calcified cavitary pulmonary lesion. The tuberculin test is positive, but sputum smears and cultures are negative for *Mycobacterium tuberculosis*. A presumptive diagnosis of secondary tuberculosis is made. If further studies, including a biopsy, were performed, which of the following findings would justify the diagnosis of secondary tuberculosis, as contrasted to primary tuberculosis?

- (A) Calcification
- (B) Caseating granulomas
- (C) Cavitation**
- (D) Langhans giant cells
- (E) Positive tuberculin test result

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16. A 50-year-old female presents with restrictive lung disease. She describes an aggressive clinical course with rapidly progressive shortness of breath over the last year. A lung biopsy reveals a patchy process characterized by temporally heterogeneous areas of fibrosis. Which of the following is most likely of her expected clinical course?

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- (A)** Symptoms should abate with smoking cessation and steroid treatment
- (B)** Prognosis is relatively good with the majority of patients surviving at 10 years
- (C)** Excellent prognosis following removal of environmental stimulus
- (D)** Poor prognosis with development of honeycomb lung and death within 5 years
- (E)** Symptoms should improve with antibiotic therapy
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17. A 45-year-old woman with no smoking history presents with new onset of cough, shortness of breath, and weight loss. Imaging reveals a peripherally located lung mass with no evidence of primary tumor elsewhere in the body. On light microscopy, the tumor is comprised of poorly formed glands. Which of the following is most likely to be true of this tumor?

- (A) Positive for synaptophysin immunostaining
- (B) Associated squamous dysplasia at the periphery of the tumor
- (C) Most likely already metastatic, therefore surgery is not recommended
- (D) Driven by tobacco-associated carcinogens
- (E) Positive for mutation in *EGFR*

1. A 25-year-old woman with a history of asthma is brought to the emergency department by emergency medical services (EMS) after ingesting a full bottle of theophylline in a suicide attempt. At presentation, she is having a tonic-clonic seizure. Her blood pressure is 80/40 mmHg, respiratory rate is 30 breaths/minute, and her heart rate is 160/minute. The EMS personnel report that she has been seizing for at least 15 minutes. What is the mechanism of action of the most appropriate drug to counteract her intoxication?

- (A) Decreasing intracellular cAMP
- (B) Increasing intracellular cAMP through β_2 -adrenergic receptors
- (C) Increasing intracellular cAMP through nonselective adrenergic receptors
- (D) Inhibiting the Na^+ - K^+ - 2Cl^- co-transporter
- (E) Inhibiting the Na^+ - K^+ -ATPase pump

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- (C) Fl
- (D) Te
- (E) Tri

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5. A newborn baby is cyanotic and is having great difficulty breathing. The baby is tachypneic and does not improve with time. At autopsy a few days later, the lungs are wet and heavy with areas of atelectasis alternating with occasional dilated alveoli or alveolar ducts. Intra-alveolar hyaline membranes consisting of fibrin and cellular debris are also present. A patent ductus arteriosus and intraventricular brain hemorrhage are also seen at autopsy. Which of the following is the likely etiology of the baby's condition?

- (A) Deficiency of hepatic glucuronyl transferase
- (B) Dipalmitoyl phosphatidylcholine deficiency^I**
- (C) Full-term uncomplicated pregnancy
- (D) Lecithin:sphingomyelin ratio in amniotic fluid >1.5
- (E) Maternal steroid abuse prior to delivery

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6. A 25-year-old medical student presents to the clinic with a nonproductive cough, low-grade fever, and malaise of three weeks' duration. A few friends in his study group have been feeling the same way. Sputum cultures are negative. The patient denies exposure to farm animals, travel, or HIV. The physician treats for an atypical pneumonia. Which of the following methods could help identify the organism responsible for this most likely causative pathogen?

(A) Acid-fast stain

(B) Cold agglutinin testing I

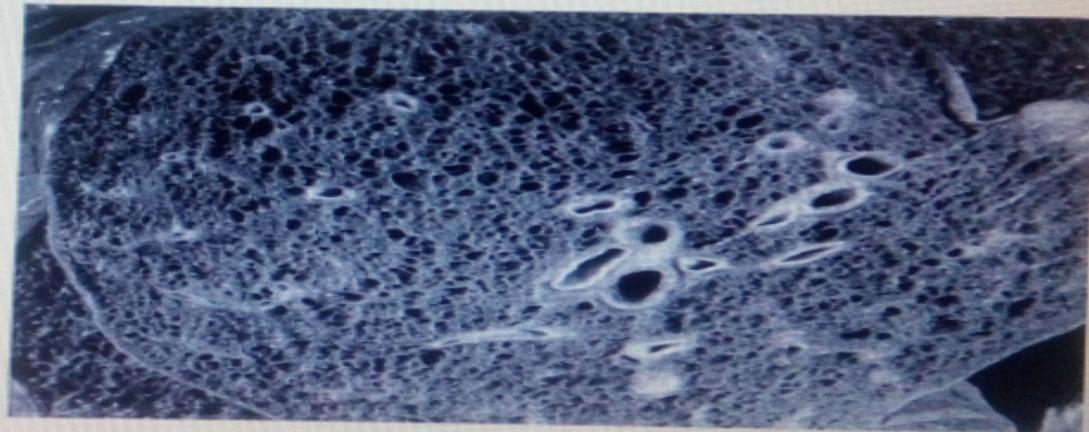
7. A 2-year-old boy presents to the emergency department because of sore throat, fever, hoarseness, and stridor. The physician suspects a diagnosis of croup, but wishes to exclude epiglottitis. Compared with croup, which of the following is characteristic of epiglottitis?

- (A) Epiglottitis is associated with inflammation of the larynx and subglottic trachea
- (B) Epiglottitis is associated with rhinorrhea and conjunctivitis
- (C) Epiglottitis often leads to respiratory distress**
- (D) Symptom onset is gradual in epiglottitis
- (E) The barking cough of epiglottitis becomes inspiratory stridor
- (F) Throat swab in epiglottitis would reveal parainfluenza virus

8. A 25-year-old man presents with new-onset hemoptysis for the past 12 hours. The patient, who recently immigrated to the United States from Vietnam, has had fever and night sweats on a daily basis for the past four years. He has no other complaints and no past medical history. The patient is diagnosed with active tuberculosis and sent home on an antimycobacterial regimen. One month later, the patient returns with new complaints of joint pain, photosensitivity, and a facial rash. Liver function tests are found to be elevated. Which of the following is the mechanism of action of the drug with the adverse effects described above?

- (A) Disrupts the cell membrane's osmotic properties
- (B) Inhibits arabinosyl transferases
- (C) Inhibits DNA-dependent RNA polymerase encoded by the *rpo* gene
- (D) Inhibits folic acid synthesis
- (E) Inhibits synthesis of mycolic acids

9. A 26-year-old man presents to the emergency department with respiratory difficulty. Starting at age of 15, he began to have periodic shortness of breath. Serial pulmonary function tests revealed gradually increasing total capacity and residual volume. His renal function laboratory results were normal, but his aspartate aminotransferase and alanine aminotransferase levels were significantly elevated. He began requiring home oxygen earlier this year, but his condition continued to worsen. He died during this admission, and an autopsy was conducted. Examination of his lungs showed the pathology seen in the image. This patient's illness was most likely caused by which of the following?



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- (A) Decreased levels of α_1 -antitrypsin
- (B) Decreased levels of elastase
- (C) Increased levels of anti-neutrophil cytoplasmic autoantibodies
- (D) Increased levels of copper
- (E) Increased levels of iron

10. A 3-year-old boy is brought to the hospital with

16. A 50-year-old woman complains of dark-colored urine and says she has not been feeling well for the past two-three weeks; she has generalized malaise and a nagging cough that occasionally is productive of blood-tinged sputum. However, she noticed changes in her urine for the first time today. Physical examination reveals an ill-appearing middle-aged woman with a blood pressure of 180/110 mm Hg. Diminished air entry in the lungs bilaterally, and an ulcerated lesion of the mucosa of the right naris, are noted. There is no history of asthma or allergies. Urinalysis is grossly positive for blood, and serum chemistry panel reveals a creatinine level of 1.7 mg/dL. What additional finding would confirm the most likely diagnosis?

- (A) Eosinophilia on WBC differential
- (B) IgA deposition in glomerular mesangium
- (C) Linear IgG deposition in the kidney
- (D) Positive for cytoplasmic anti-neutrophilic cytoplasmic antibodies**
- (E) Positive for hepatitis B

17. A 35-year-old African-American woman presents to the clinic complaining of fatigue, dry cough, and dyspnea. X-ray of the chest is shown in the image. Lung parenchymal biopsy reveals a noncaseating granuloma. Which of the following cutaneous manifestations is associated with this condition?

19.



Volume (mL)

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- (A) Erythema infectiosum
- (B) Erythema migrans
- (C) Erythema multiforme
- (D) Erythema nodosum**
- (E) Erythema toxicum

Repro

18. An 18-year-old man comes to the physician complaining of a runny nose, sneezing, and difficulty breathing for the past two days. He says that when he goes outside or is away from his house, his symptoms improve. On physical examination his turbinates are boggy and violaceous. This type of reaction is most similar to which of the following?

- (A) Anaphylaxis
- (B) Contact dermatitis
- (C) Goodpasture syndrome
- (D) Graft-versus-host disease
- (E) Post-streptococcal glomerulonephritis

20. A 5-year-old girl visiting from Mexico is brought to the emergency department by her aunt because of a sore throat and general malaise for the past three days. Physical examination reveals temperature of 38°C (100.4°F) and a grayish-white membrane on the pharynx that bleeds on attempted dislodgement. Which of the following is the most appropriate culture media for diagnosing this patient's infection?

- (A) Bordet-Gengou agar
- (B) Chocolate agar with factors V and X
- (C) Sabouraud agar
- (D) Tellurite agar**
- (E) Thayer-Martin agar

21. A 57-year-old man presents to the emergency department (ED) with fever, night sweats, and a productive cough with occasional hemoptysis. He is started empirically on several medications for his underlying disease. At follow-up several months later, he reports difficulty reading the paper in the morning and has been found to wear unusual color combinations at work. Which of the following is the most likely cause of this patient's new symptoms?

- (A) Ethambutol toxicity
- (B) Isoniazid toxicity
- (C) Pyrazinamide toxicity
- (D) Rifampin toxicity
- (E) Tuberculous eye infection

23. A pregnant woman who suffers from hypertension and thrombocytopenia and has elevated liver function tests suddenly has a seizure. Suspecting eclampsia, the obstetrics team performs an emergency cesarean section. The neonate is delivered at 30 weeks and is found to have bradycardia. The child also appears to have labored breathing. He is rushed to the neonatal intensive care unit, where he is intubated and treated with steroids. Which of the following is a characteristic of the alveoli of this neonate's lungs?

- (A) An increased pressure is needed to collapse the lungs
- (B) Increased surface tension**
- (C) The lungs have increased compliance
- (D) The lungs lack a substance produced mainly by type I pneumocytes
- (E) The lungs produce a substance with a lecithin:sphingomyelin ratio >1.5

24. A 12-year-old boy is found unconscious in his

28. A 74-year-old retired shipyard laborer with a 45-pack-year smoking history and previous work in sandblasting and fiberglass operations presents with increasing shortness of breath and peripheral edema. On physical examination he is a thin, cyanotic man in moderate pulmonary distress. His chest shows an increased anteroposterior diameter, and the breath sounds are faint with a prolonged expiration. The liver edge is 3 cm below the right costal margin. There is no digital clubbing, but marked peripheral edema is present. Arterial blood gas analysis reveals a partial oxygen pressure of 43 mm Hg, a partial carbon dioxide pressure of 22 mm Hg, and a pH of 7.51. Which set of laboratory parameters is most likely to be found?

Choice	FEV ₁	FVC	FEV ₁ :FVC	Total lung capacity
A	↓	↓	↓	↓
B	↓	↓	↓	↑
C	↓	↓	normal	↓
D	↓	normal	normal	↓
E	↓	↑	↑	↑

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- (A) A
- (B) B**
- (C) C
- (D) D
- (E) E

31. A 68-year-old man who smokes and is alcoholic abruptly develops high fever, shakes, a severe headache, and abdominal and muscle pain. He initially has a dry, insignificant cough, but over the next few days he develops marked shortness of breath requiring assisted ventilation. X-ray of the chest demonstrates homogenous radiographic shadowing involving both the lungs extensively. Culture of bronchoalveolar lavage fluid on buffered charcoal yeast extract demonstrates a coccobacillary pathogen. What is the most likely causative organism?

- (A) *Legionella pneumophila*
- (B) *Listeria monocytogenes*
- (C) *Spirillum minus*
- (D) *Staphylococcus aureus*
- (E) *Streptococcus pneumoniae*

37. Public health investigators are looking into a series of illnesses that have occurred in a small community. Many patients presented with acute-onset hyperpyrexia and a particularly severe pneumonia. Gram staining of their sputum cultures reveals neutrophils and very few organisms. Which of the following organisms is most likely to have caused this outbreak?

- (A) *Bordetella pertussis*
- (B) *Haemophilus influenzae* type B
- (C) *Legionella pneumophila*
- (D) *Mycobacterium tuberculosis*
- (E) *Streptococcus pneumoniae*

38. A 26-year-old recent immigrant from Mexico presents to the emergency department with a three-week history of fevers accompanied by night sweats and chills, weight loss of 2.3 kg (5 lb), and cough that is often productive of blood-tinged sputum. Bronchoalveolar lavage is performed and an acid-fast stain of the sample reveals the organism shown in the image. Which of the following should be included in this patient's therapy to prevent a common toxicity of treatment?



Courtesy of Dr. George P. Kubica, Centers for Disease Control and Prevention.

- (A) Cobalamin
- (B) Pyridoxine**
- (C) Vitamin B₁
- (D) Vitamin C
- (E) Vitamin E

42. A 63-year-old smoker visits his primary care physician because of recent weight gain and worsening coughs. On physical examination the physician notes that the patient's extremities are thinner than before, while his waist is increased in girth. The patient also has a pad of adipose tissue at the base of his neck and purple striae on his abdomen. The physician decides to run some blood tests and obtain an x-ray of the chest, which shows a central lesion. Which of the following is the most likely diagnosis?

- (A) Adenocarcinoma
- (B) Bronchial carcinoid
- (C) Metastatic disease affecting the lung
- (D) Small cell carcinoma**
- (E) Squamous cell carcinoma embolism

45. A 56-year-old man presents to the emergency department because of cough, dyspnea, and hemoptysis. X-ray of the chest shows dilation of his airways, which is confirmed by bronchoscopy. Which of the following conditions is most likely responsible for the dilation of this patient's airways?

- (A) Adult respiratory distress syndrome
- (B) Asthma
- (C) Atelectasis
- (D) Bronchiectasis**
- (E) Churg-Strauss syndrome

46. A 15-year-old boy with a history of severe

50. A 65-year-old man with a 110-pack-year history of smoking presents to his primary care physician because of shortness of breath, dyspnea on exertion, and cough for three months' duration. X-ray of the chest reveals flattened diaphragms bilaterally. The doctor orders pulmonary function tests to evaluate the patient. Which of the following pulmonary function test results would most likely be found in this patient?

- (A) Decreased $FEV_1:FVC$
- (B) Decreased functional residual capacity
- (C) Decreased total lung capacity
- (D) Increased FEV_1
- (E) Increased $FEV_1:FVC$



Good luck

