

RS U-WORLDS

This file includes the u-world questions of the Respiratory System module from Dr. Suleiman's website

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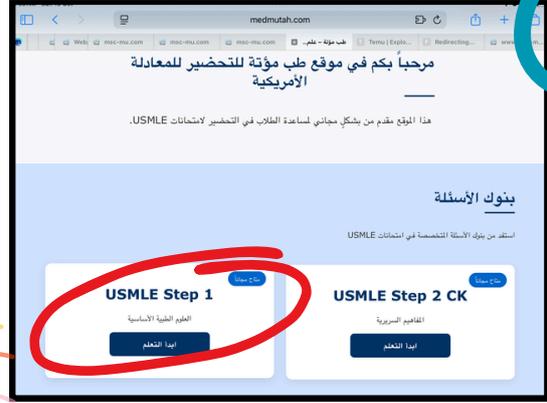
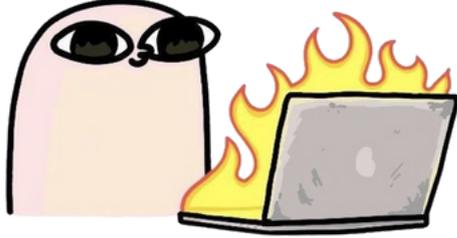
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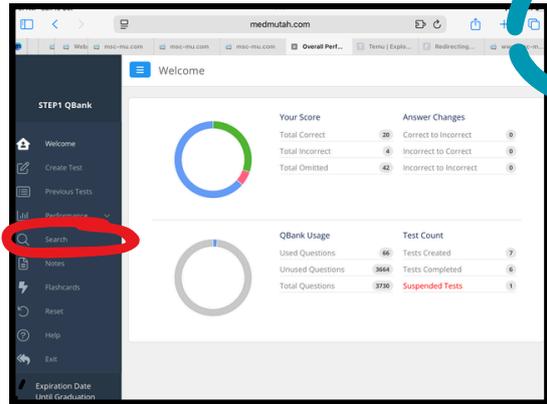


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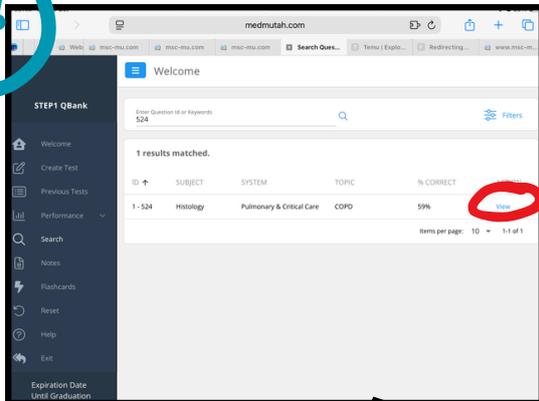
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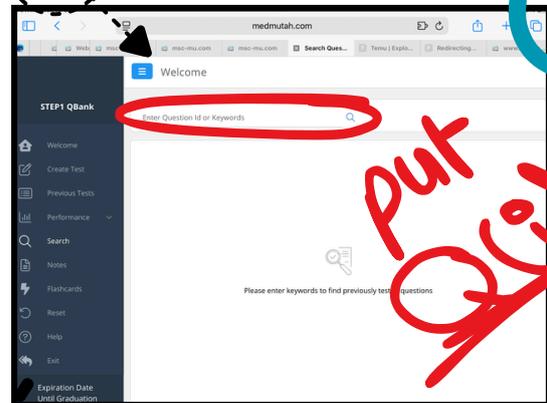
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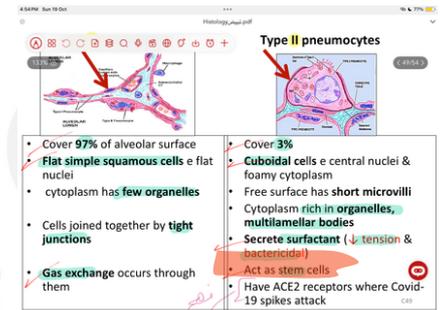


3

HISTOLOGY

Physicians involved in regenerative medicine research conduct a series of animal experiments to determine pulmonary tissue regeneration capacity. During one of the experiments, lung alveoli are exposed to NO, and massive necrosis of the epithelial lining ensues. Histologic examination of the injured tissues a month later shows partial recovery of the alveolar epithelial lining. This regenerated tissue is most likely derived from which of the following cell types?

- A. Alveolar macrophages
- B. Ciliated epithelium
- C. Club cells
- D. Goblet cells
- E. Type I pneumocytes
- F. Type II pneumocytes

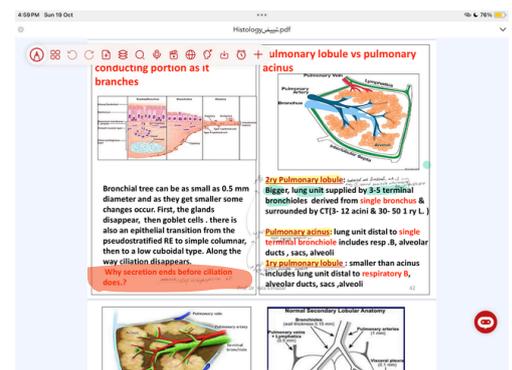


answer : f
id : 478.

Fourth-year medical students are recruited for a research study assessing their ability to interpret biopsy samples obtained during routine clinical practice. As part of the study, they are given samples of normal respiratory mucosa and asked to identify the cell types present after staining with hematoxylin and eosin. The students observe that the respiratory epithelium changes in composition as the airways continue distally from the trachea to the alveolar ducts. Which of the following features is last to disappear?

- A. Cartilage
- B. Cilia
- C. Goblet cells
- D. Mucous glands
- E. Serous glands

answer : b
id : 480



ANATOMY

A 13-year-old girl is admitted for fever, cough, and malaise for the past two days. She has no history of sick contacts and all her immunizations are up to date. Her leukocyte count is 21,000/mm³ with 7% band forms. Upright chest x-ray findings are shown in the image below:

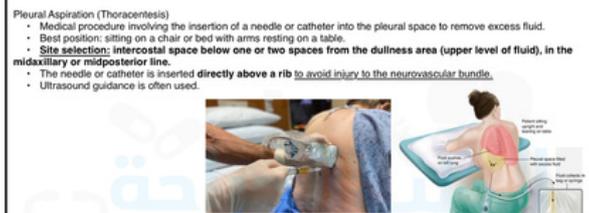
- A. Left lower lung lobe (12%)
- B. Left pleural space (8%)
- C. Right middle lung lobe (34%)
- D. Right pleural space (2%)
- E. Right upper lung lobe (43%)



answer : e
id : 16285

A 66-year-old man hospitalized 3 days ago for left lower lobe pneumonia is evaluated for persistent fever. He has been receiving the appropriate intravenous antibiotics as determined by antibiotic susceptibility testing of his sputum cultures. The patient has a history of diabetes mellitus and hypertension. His temperature is 38 C (100.4 F) and pulse is 87/min. Examination shows dullness to percussion and decreased breath sounds over the left lower lung. Imaging studies reveal a loculated, left-sided pleural effusion. A tube is placed to drain the fluid via an incision at the 5th intercostal space in the midaxillary line. Which of the following muscles is most likely to be dissected during the procedure?

- A. External oblique (11%)
- B. Infraspinalis (1%)
- C. Latissimus dorsi (15%)
- D. Pectoralis major (12%)
- E. Serratus anterior (60%)



answer : e
id : 11741

اخذنا عن PLEURAL ASPIRATION بس السؤال يعتمد على معرفتك بعضلات ال UPPER LIMB في مادة الجينيرال

الصورة من شبكات اليجنة وليس من سلايدات الدكتور

A 32-year-old man comes to the hospital due to 1 week of progressive shortness of breath and cough. He also reports sharp right-sided chest pain that is worsened by deep inspiration. Examination reveals decreased tactile fremitus, dullness on percussion, and decreased breath sounds over the right lower lung. Chest x-ray shows consolidation of the right lower lobe and a right-sided effusion. A thoracentesis is performed, during which the needle is inserted along the upper border of the 10th rib at the right midaxillary line. Which of the following structures is most at risk of being injured as a result of the intervention?

- A. Hepatic veins (2%)
- B. Intercostal artery (8%)
- C. Intercostal nerve (26%)
- D. Right hepatic lobe (40%)
- E. Right lower lung lobe (23%)

Relations of the Lungs

1. **Apex**
- Covered by the suprapleural membrane.

2. **Base**

- Related to:
 - Right lung: right cupola of diaphragm and right lobe of liver.
 - Left lung: left cupola of diaphragm; left lobe of the liver; spleen, and fundus of the stomach.

3. **Costal Surface**

- Smooth and convex.
- Related to:
 - a) Ribs and their costal cartilages.
 - b) Intercostal muscles, nerves, and vessels.

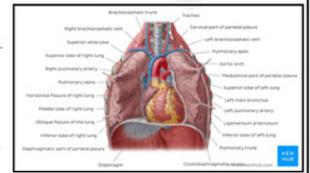
4. **Medial Surface**

Contains the hilum, divided into two parts:

I. **Posterior Part (Vertebral Surface):**

- Related to:
 - Vertebral column and intervertebral discs.
 - Sympathetic chains and splanchnic nerves.
 - Posterior intercostal nerves and vessels.

II. **Anterior Part (Mediastinal Surface):**



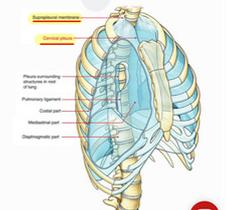
answer : d
id : 844

28/min, blood pressure is 88/60 mm Hg, and heart rate is 114/min. Physical examination shows a penetrating right-sided stab wound along the upper surface of the clavicle between the lateral border of the sternum and the midclavicular line. Which of the following structures was most likely injured?

- A. Accessory nerve (6%)
- B. Ansa cervicalis (7%)
- C. Carotid body (14%)
- D. Inferior thyroid artery (7%)
- E. Lung pleura (66%)

Clinical Note

- The cervical dome of the pleura and apex of the lungs extend into the neck, covered by the **suprapleural membrane**.
- Therefore, they are vulnerable to stab wounds in the root of the neck or damage by an anesthetist's needle during a lower trunk brachial plexus nerve block.



answer : e
id : 1695

A 68-year-old man is evaluated in the hospital due to a pleural effusion. He has a history of base of tongue squamous cell carcinoma with involvement of multiple left anterior cervical lymph nodes. Two days ago, the patient underwent surgery to remove the tumor and the anterior cervical lymph nodes. Today, he has increasing shortness of breath, and chest x-ray reveals a large left pleural effusion. Which of the following was most likely injured during this patient's surgical procedure?

- A. Esophagus (1%)
- B. Innominate artery (3%)
- C. Lung parenchyma (15%)
- D. Phrenic nerve (18%)
- E. Thoracic duct (58%)
- F. Trachea (4%)

answer : e
id : 18656

A 63-year-old man is admitted to the hospital after suffering a cerebral infarction. A swallow study performed during the acute recovery period shows oropharyngeal dysphagia. Despite being maintained on the appropriate dietary restrictions, the patient experiences an episode of vomiting while lying on his back and subsequently develops pneumonia. Which of the following lung regions is most likely to be affected?

- A. Anterior segment of the left upper lobe (2%)
- B. Basilar segments of the right lower lobe (22%)
- C. Lingular segments of the left lung (1%)
- D. Middle lobe segments of the right lung (19%)
- E. Posterior segment of the right upper lobe (56%)

answer : e
id : 1745

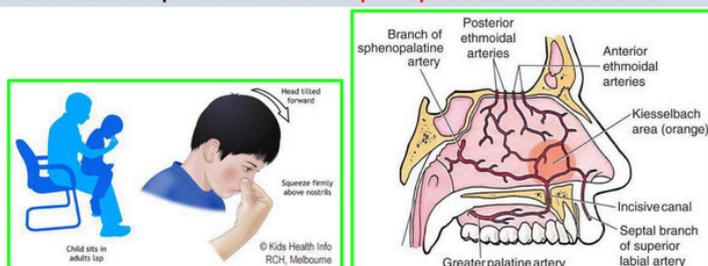
هسته احنا اخذنا انه اذا بدخل اشبي للرئة غالبا رح يدخل على الجهة اليمين فهذا كان القسم الاول من الاحابة والقسم الثاني بدك تستنجه من وضعية المريض اللي كان عليها

A 6-year-old boy is brought to the emergency department by his parents due to persistent nasal bleeding. The boy picks his nose frequently and has had several nosebleeds in the past, all of which stopped spontaneously after pinching the nose. The parents say that they have been pinching the nasal alae for over 30 minutes while the boy leans forward. Family history is negative for bleeding disorders. The patient takes no medications and has no allergies. Examination shows continuous blood trickle from his right nostril. Silver nitrate cautery is performed and the bleeding stops. Cautery was most likely applied to which of the following locations in this patient's nasal cavity?

- A. Inferior turbinate (12%)
- B. Middle meatus (10%)
- C. Nasal septum (45%)
- D. Posterior choanae (11%)
- E. Posterolateral wall (21%)

answer : c
id : 11783

Nose Bleeding Epistaxis, or bleeding from the nose, is a frequent condition. The most common cause is nose picking. The bleeding may be arterial or venous, and most episodes occur on **the anteroinferior portion of the septum** and involve the septal branches of **the sphenopalatine and facial vessels**

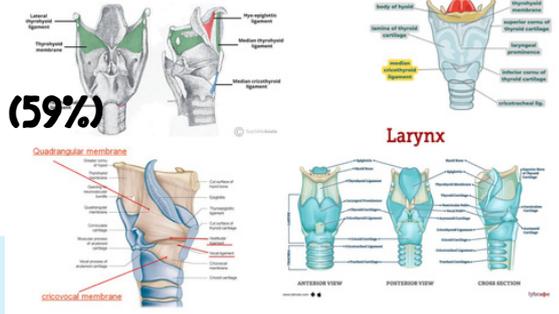


A 36-year-old man is rushed to the emergency department after sudden onset of shortness of breath and difficulty swallowing. He has visited the emergency department several times before due to food and skin allergies. The patient is unconscious on arrival. Examination shows excessive accessory respiratory muscle use and edematous swelling of the face, lips, and tongue. There is also scattered urticaria over the upper body. Attempts at intubation are unsuccessful due to massive soft tissue edema involving the pharynx. A decision is made to perform an emergency cricothyrotomy. The incisions made during this procedure will most likely pass through which of the following structures?

- A. Buccopharyngeal fascia and platysma (2%)
- B. Platysma and thyroid isthmus (4%)
- C. Pretracheal fascia and cricoid cartilage (34%)
- D. Pretracheal fascia and prevertebral fascia (2%)
- E. Superficial cervical fascia and cricothyroid membrane (59%)

Cricothyroid Ligament (Conus Elasticus)

- Its lower border is attached to the **cricoid cartilage**, and the upper border ascends on the **thyroid cartilage**.
- The upper free margin forms the **vocal ligament** on each side.
- The vocal ligament forms the core of the **vocal fold (true vocal cord)**.
- The anterior end attaches to the **thyroid cartilage**, and the posterior end attaches to the **vocal process of the arytenoid cartilage**.



answer : e
id : 8631

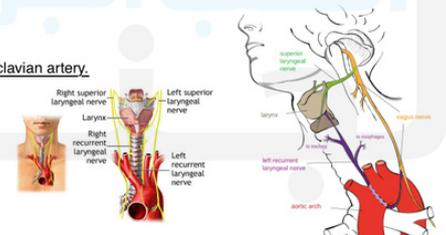
A 44-year-old man comes to the office for evaluation of a neck lump. The patient first noticed the lump 6 months ago while he was shaving and says that it seems to be growing in size. He has no pain, shortness of breath, cough, hoarseness, or difficulty swallowing. The patient had Hodgkin lymphoma 20 years ago, which was successfully treated with radiation therapy to his chest and neck. Physical examination shows a firm mass in the left thyroid lobe. There is no lymphadenopathy. Serum TSH level is normal. Fine-needle aspiration biopsy reveals papillary thyroid cancer. A total thyroidectomy is performed. During an attempt to ligate the inferior thyroid artery, a nervous structure in close proximity is inadvertently damaged. Which of the following was most likely injured during the surgery?

- A. Accessory nerve (1%)
- B. Ansa cervicalis (2%)
- C. Hypoglossal nerve (1%)
- D. Phrenic nerve (2%)
- E. Recurrent laryngeal nerve (82%)
- F. Superior cervical ganglion (1%)
- G. Superior laryngeal nerve (12%)

Important Branches of the Vagus Nerve in the Neck

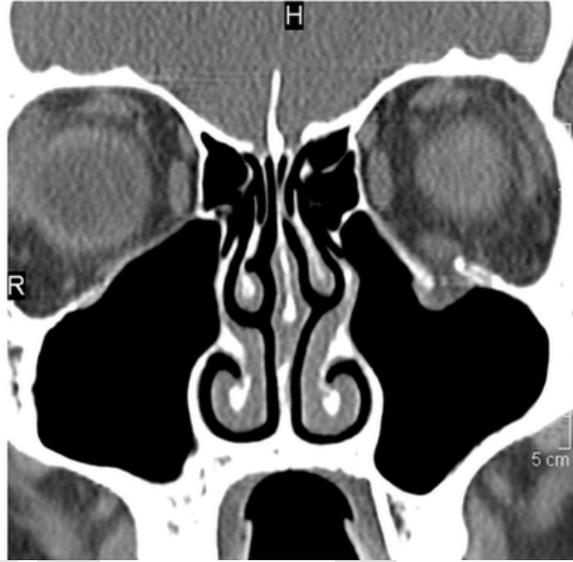
Recurrent Laryngeal Nerve

- **Right side:** Loops around the **first part of the subclavian artery**.
- **Left side:** Loops around **the arch of the aorta**.
- Closely related to the **inferior thyroid artery**.
- Supplies:
 - All intrinsic muscles except cricothyroid.
 - Mucosa below the vocal cords.
 - Mucosa of the upper part of the trachea.



answer : e
id : 1686

A 30-year-old man comes to the emergency department due to left eye pain after being involved in a street fight. He received a fist blow to the left eye and has since had pain and diplopia. Past medical history is notable for 2 previous gunshot wounds. The patient does not smoke cigarettes but has a history of heavy alcohol intake and frequent marijuana use. On examination, there is significant soft tissue swelling around the left eye. Visual acuity is normal, but extraocular motility of the left eye is limited. Pupillary reflexes are normal. Coronal CT scan of the orbits is shown in the image below.



The orbital contents of this patient are most likely to herniate into which of the following sites?

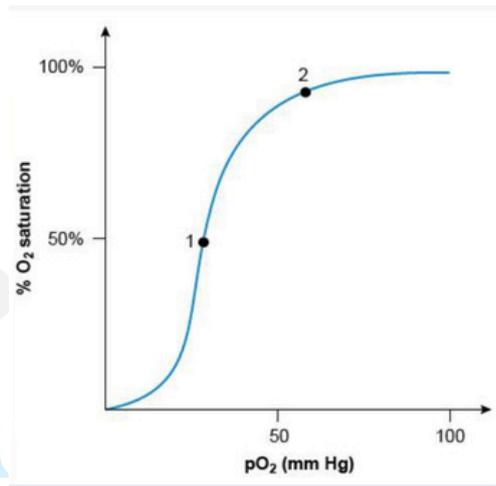
- A. Ethmoid cells (5%)
- B. Frontal sinus (3%)
- C. Inferior conchae (1%)
- D. Maxillary sinus (85%)
- E. Sphenoid sinus (7%)

answer : d
id : 1698

BIOCHEMISTRY

Molecular biologists studying the properties of hemoglobin are investigating the structural 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 (13%)
- B. Heme (4%)
- C. Oxygen (24%)
- D. Phosphate (7%)
- E. Protons (51%)



answer : e
id : 1386

A 44-year-old man is evaluated due to progressive dyspnea over the past several years. The patient has no associated chest pain or palpitations. Physical examination shows a prolonged expiratory phase without wheezes or rhonchi. CT scan of the chest demonstrates bilateral lower lobe-predominant emphysema. Further testing reveals that the patient has a protease inhibitor deficiency, which has led to increased elastin fiber breakdown. Elastin fibers within alveolar walls normally allow the lung to stretch during active inspiration and recoil during passive expiration. Which of the following most likely contributes to this property of elastin?

- A. Abundant interchain disulfide bridges (23%)
- B. Chain assembly to form a triple helix (16%)
- C. Heavy post-translational hydroxylation (10%)
- D. High content of polar amino acids (8%)
- E. Interchain cross-links involving lysine (44%)

• **Emphysema resulting from α 1-AT deficiency:**

- 1- The most widespread mutation of α 1-AT deficiency is a single purine base mutation in codon from GAG to AAG, resulting in the substitution of glutamic acid (negatively charged) at position 342 with lysine (positively charged).
- This amino acid substitution alter the charge attraction between the amino acids at position 342 and 290 (lysine) present in the normal form of α 1-AT and prevent the formation of a fold in the molecule.
- This change in the tertiary structure promotes dimerization of α 1-AT in the endoplasmic reticulum that obstructs secretion of the protein from the cell and result in low level of α 1-AT.
- An individual must inherit two abnormal α 1-AT alleles to be at risk for the development of emphysema.
- In a heterozygote, with one normal and one defective gene, the levels of α 1-AT are sufficient to protect the alveoli from damage.

answer : e
id : 1249

MICROBIOLOGY

اغلب اسئلة المايكروبيولوج تذكر فقط اسم المماضرة لأنه الإجابة بتعمد على أكثر من سلايد

A 60-year-old man is brought to the emergency department following a motor vehicle collision. He is comatose and unable to provide any information. Multiple blunt injuries of the torso and abdomen are present. Review of the patient's medical record reveals a history of right upper lobe cavitory tuberculosis that was effectively treated several years ago. Recent notes from the primary care physician indicate the patient is otherwise healthy, with no fevers, night sweats, or weight loss. He is a never smoker. After initial stabilization, CT of the head, neck, chest, abdomen, and pelvis is obtained. A representative slice of the chest CT, shown in the image below, redemonstrates his known right upper lobe cavity. Compared to prior imaging, the cavity now appears to be filled with a round mass as shown in the exhibit. Which of the following best describes this patient's condition?

- A. Allergic inflammation (4%)
- B. Chronic colonization (41%)
- C. Contagious infection (11%)
- D. Heterotopic calcification (38%)
- E. Invasive malignancy (6%)



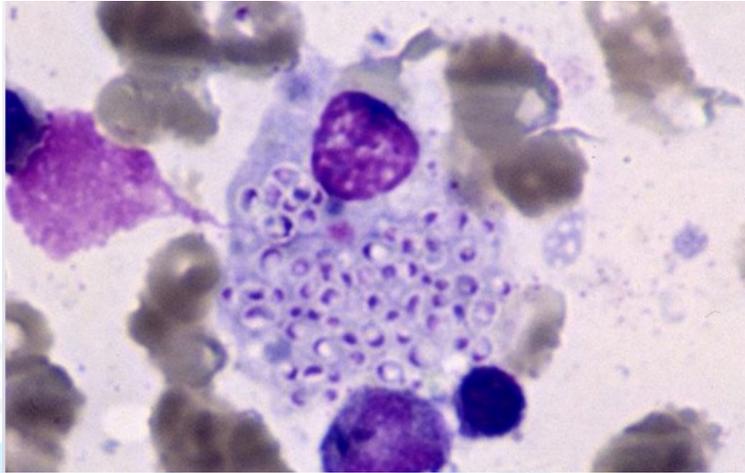
answer : b
id : 108
lec 10

A 21-year-old previously healthy man comes to the office due to fever, malaise, myalgia, and nonproductive cough. His symptoms began 2 weeks after returning from exploring caves in Missouri. The patient does not use tobacco, alcohol, or illicit drugs. Temperature is 38.3 C (100.9 F), blood pressure is 120/70 mm Hg, pulse is 96/min, and respirations are 16/min. Physical examination reveals lung crackles. Chest x-ray shows patchy parenchymal infiltrates with enlarged mediastinal and hilar lymph nodes. Which of the following is most likely to be present in this patient's pulmonary lesions?

- A. Budding yeasts with a thick capsule (11%)
- B. Macrophages with intracellular small yeasts (63%)
- C. Round spherules with multiple endospores (13%)
- D. Septate hyphae with dichotomous branching (6%)
- E. Yeasts with pseudohyphae and blastoconidia (6%)

answer : b
id : 266
lec 10

A 54-year-old man with HIV comes to the emergency department due to nonproductive cough, low-grade fevers, and worsening fatigue for the past month. He has also lost 3.6 kg (8 lb) over the same period. The patient does not take antiretroviral therapy consistently and has not followed up with his primary care physician for the past several months. Physical examination reveals hepatosplenomegaly. Laboratory testing shows pancytopenia and elevated liver aminotransferases. Bone marrow aspiration is performed, and light microscopy of the specimen is shown below.



Which of the following is the most likely cause of this patient's current condition?

- A. *Aspergillus fumigatus*
- B. *Blastomyces dermatitidis*
- C. *Candida albicans*
- D. *Coccidioides immitis*
- E. *Cryptococcus neoformans*
- F. *Histoplasma capsulatum*

answer : f
id : 267
lec 10

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. She is currently asymptomatic. She has no other medical problems and has never traveled outside the United States. Her medications include albuterol as needed and medium-dose inhaled glucocorticoids. Temperature is 37.1 C (98.8 F). Physical examination is unremarkable. 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 (5%)
- B. *Aspergillus fumigatus* (53%)
- C. *Legionella pneumophila* (4%)
- D. *Pseudomonas aeruginosa* (10%)
- E. *Streptococcus pneumoniae* (7%)
- F. *Strongyloides stercoralis* (20%)

answer : b
id : 665
lec 10

A 46-year-old man is brought to the emergency department 30 minutes after being found intoxicated in a park. The patient reports a 10-day history of fevers, night sweats, weight loss, and productive cough with foul-smelling sputum. He drinks 1 or 2 pints of vodka daily and has been hospitalized multiple times for intoxication. Temperature is 38.9 C (102 F), blood pressure is 110/65 mm Hg, pulse is 102/min, and respirations are 22/min. Lung auscultation reveals coarse crackles over the right lower lobe. Heart sounds are normal with no murmurs. Laboratory results show an elevated leukocyte count. Chest x-ray reveals a cavitory lesion with an air-fluid level in the superior segment of the right lower lobe of the lung. Which of the following is the most likely cause of this patient's lung findings?

- A. Aspiration of gastric acid (14%)
- B. Aspiration of oropharyngeal bacteria (66%)
- C. Hematogenous spread from another focus of infection (3%)
- D. Primary mycobacterial infection (12%)
- E. Simple pulmonary aspergilloma (5%)

answer : b
id : 532

A 62-year-old man comes to the emergency department due to sudden-onset of high fever, shaking chills, shortness of breath, and productive cough. The patient has smoked a pack of cigarettes daily for 40 years. Examination shows dullness to percussion over the left side of the chest. Chest x-ray reveals consolidation in the left upper lobe. Gram stain of the sputum shows numerous polymorphonuclear leukocytes and gram-positive cocci in pairs. When cultured on a blood agar plate under aerobic conditions, the bacterial colonies are surrounded by a zone of incomplete hemolysis. The organism responsible for this patient's condition is most likely to exhibit which of the following virulence features?

- A. Inhibition of host protein synthesis (8%)
- B. Motility within host tissue (3%)
- C. Prevention of phagosome-lysosome fusion (12%)
- D. Resistance to phagocytosis (73%)
- E. Survival in extreme environments (4%)

answer : d
id : 730
lec 1



A 46-year-old man comes to the office due to 3 days of fever, shortness of breath, pleuritic chest pain, and cough with purulent sputum. The patient has no prior medical conditions and takes no medications. He has smoked a pack of cigarettes daily for 20 years. Temperature is 38 C (100.4 F). On examination, there are crackles at the base of the left lung. Chest x-ray reveals consolidation in the left lower lobe. Microscopic analysis of a sputum sample shows gram-positive, lancet-shaped cocci in pairs. Which of the following additional characteristics are these bacteria most likely to demonstrate?

- A. Ability to hydrolyze with pyrrolidonyl arylamidase (8%)
- B. Complete hemolysis on blood agar (13%)
- C. Growth in hypertonic saline (3%)
- D. Lysis in the presence of bile salts (49%)
- E. Production of the catalase enzyme (9%)
- F. Resistance to optochin (18%)

answer : d
id : 731
lec 1

A 78-year-old man is brought to the emergency department due to fever, cough, and shortness of breath. The patient recently moved into an assisted living facility after living with his family that owned several pets. He has a 40-pack-year smoking history. Temperature is 39.4 C (103 F), blood pressure is 106/62 mm Hg, pulse is 112/min, and respirations are 28/min. There is dullness to percussion and bronchial breath sounds over the left lung. Chest x-ray reveals a left lower lobe consolidation. Sputum microscopy shows gram-positive diplococci. Which of the following would have been most helpful in preventing this patient's lung infection?

- A. Avoidance of exposure to bird droppings (5%)
- B. Immediate chemoprophylaxis after exposure (5%)
- C. Immunization with inactivated microbial agent (13%)
- D. Periodic culture and disinfection of water supply (4%)
- E. Vaccination with bacterial polysaccharide (73%)

answer : e
id : 734
lec 1

A 15-year-old boy is evaluated for fever, headache, malaise, and cough 3 weeks after returning from summer camp. Lung auscultation is unremarkable. Chest x-ray reveals nodular infiltrates. The patient's blood samples are collected for analysis in anticoagulated tubes, which are transported submerged in ice; when taken out several minutes later, turbidity and clumping are noted. Warming the tube to body temperature leads to rapid dissolution of the clumps. Which of the following organisms is most likely responsible for this patient's condition?

- A. *Coccidioides immitis* (4%)
- B. *Coxiella burnetii* (3%)
- C. *Haemophilus influenzae* (5%)
- D. *Histoplasma capsulatum* (5%)
- E. *Klebsiella pneumoniae* (2%)
- F. *Legionella pneumophila* (6%)
- G. *Mycobacterium kansasii* (2%)
- H. *Mycoplasma pneumoniae* (68%)
- I. *Pneumocystis jirovecii* (1%)
- J. *Streptococcus pneumoniae* (5%)

answer : h
id : 958
lec 2

A 63-year-old man is brought to the emergency department due to high fever, confusion, headache, watery diarrhea, and cough. The patient smokes 2 packs of cigarettes daily and has a history of chronic bronchitis. Temperature is 40.1 C (104.2 F), blood pressure is 100/70 mm Hg, pulse is 91/min, and respirations are 28/min. Sputum Gram staining reveals numerous neutrophils but no bacteria. Which of the following is the most likely cause of this patient's current condition?

- A. *Coccidioides immitis* (6%)
- B. *Klebsiella pneumoniae* (5%)
- C. *Legionella pneumophila* (64%)
- D. *Mycobacterium kansasii* (4%)
- E. *Mycoplasma pneumoniae* (21%)

answer : c
id : 960
lec 2

Several residents of a long-term care facility develop febrile illness within a short period of time. Symptoms include fever, nonproductive cough, myalgia, rigors, dyspnea, and diarrhea. Organisms found in induced sputum samples stain poorly with Gram stain but are visualized easily using silver stain. Urine testing for bacterial antigens is positive in most of the affected individuals. Which of the following is the most likely source of this outbreak?

- A. Anterior nares of colonized staff (4%)
- B. Building water-distribution system (80%)
- C. Contaminated ready-to-eat food (5%)
- D. Nasopharynx of infected resident (10%)
- E. Skin flora of affected residents (1%)

answer : b
id : 961
lec 2

A 5-year-old boy is brought to the emergency department by his parents for severe respiratory distress. He has not received any immunizations due to parental preference, and his medical history is otherwise unremarkable. The patient appears very uncomfortable and anxious. He is leaning forward and making a loud, harsh sound with every inspiration. Temperature is 39.6 C (103.4 F). The patient is intubated immediately. During intubation, the epiglottis is visualized and appears markedly swollen and erythematous. Which of the following is a major virulence factor of the pathogen causing this patient's infection?

- A. Lecithinase (12%)
- B. M protein (14%)
- C. Polyribosy ribitol phosphate (52%)
- D. Protein A (17%)
- E. Trehalose dimycolate (5%)

answer : c
id : 962
lec 9

A 3-year-old boy who recently immigrated to the United States is brought to the emergency department with fever, malaise, and a painful, swollen right knee. He is hypotensive and tachycardic. Medical history is significant for a recent episode of acute otitis media and several vaccinations that are not up to date. Arthrocentesis of the right knee shows cloudy synovial fluid. Gram stain of the aspirate reveals pleomorphic, gram-negative coccobacilli. Cultures performed on a blood agar plate supplemented with a disk containing hematin and nicotinamide adenine dinucleotide (NAD*) grow colonies only near the disk. The organism responsible for this patient's condition most likely produces which of the following virulence factors?

- A. Capsule (68%)
- B. Cytotoxic exotoxin (6%)
- C. Fimbriae (6%)
- D. Hemolysins (11%)
- E. Hyaluronidase (9%)

answer : a
id : 964
lec 9

A 3-year-old boy is brought to the emergency department with breathing difficulty and drooling that have worsened rapidly over the last 8 hours. He has no chronic medical conditions. Temperature is 39.4 C (102.9 F). Examination shows a toxic-appearing patient leaning forward while sitting on the bed; he has inspiratory stridor and suprasternal retractions. There are pooled oral secretions, and the patient is unable to swallow. Which of the following is the greatest risk factor for this patient's condition?

- A. Foreign body aspiration (14%)
- B. History of food allergy (5%)
- C. Incomplete vaccination series (77%)
- D. Recent international travel (2%)
- E. Secondhand smoke exposure (2%)

answer : c
id : 967
lec 9

A 2-day-old boy is evaluated in the neonatal intensive care unit for lethargy and respiratory distress. The patient was born at home via spontaneous vaginal delivery at term gestation to a mother who did not receive routine prenatal care. Temperature is 38.9 C (102 F) and pulse is 162/min. Physical examination shows tachypnea and grunting. Blood cultures grow beta-hemolytic, gram-positive cocci in chains that elicit a narrow zone of complete hemolysis on blood agar. Which of the following virulence factors most likely contributed to the development of this patient's current condition?

- A. Antigenic variation (2%)
- B. Endotoxin (7%)
- C. Exotoxin (11%)
- D. M protein (20%)
- E. Polysaccharide capsule (60%)

answer : e
id : 999
lec 1

A 52-year-old man comes to the office with 3 weeks of cough, night sweats, and occasional hemoptysis. The patient also has type 2 diabetes mellitus and hypertension. He emigrated from Vietnam 15 years ago to start a job as an associate professor at a university. He has a 20 pack-year smoking history but quit 5 years ago. Sputum cultures grown on a selective medium demonstrate mycobacteria that grow in parallel chains forming serpentine cords under microscopy. This observed growth pattern most strongly correlates with which of the following bacterial characteristics?

- A. Acid-fastness (40%)
- B. Antibiotic resistance (6%)
- C. Pigmentation (1%)
- D. Replication rate (11%)
- E. Virulence (42%)

answer : e
id : 1216
lec 3

A 63-year-old man comes to the emergency department due to fever and cough. A medical student interviews and examines the patient and notes that he has had 3 months of fevers, night sweats, and productive cough. Chest x-ray reveals a right apical lung lesion, and the patient is subsequently placed in respiratory isolation. The medical student was in close contact with the patient during the initial interview and the patient coughed frequently during their interaction. The student had a negative tuberculin skin test prior to beginning the rotation. of this patient's infectious disease is transmitted to the student, which of the following processes is most likely to occur during the first week after exposure?

- A. Epithelioid transformation of macrophages (13%)
- B. Interferon secretion by activated T lymphocytes (33%)
- C. Intracellular bacterial proliferation (46%)
- D. Mounting response by B lymphocytes (7%)
- E. Scattered areas of caseous necrosis (1%)

answer : c
id : 1217
lec 3

An outbreak of infection with a seasonal influenza A strain is reported in a small community. The strain is similar to the one that circulated in the preceding year. Approximately 70% of the adult population in that community remains uninfected, despite prolonged and repeated exposure to ill contacts. Which of the following is the most important host factor in preventing influenza infection in these subjects?

- A. Antibodies against hemagglutinin (54%)
- B. Antibodies against neuraminidase (24%)
- C. Antibodies against RNA polymerase (4%)
- D. Antigen-nonspecific macrophage response (3%)
- E. T-cell response against nucleocapsid proteins (15%)

answer : a
id : 1649
lec 5

Health authorities are investigating an outbreak of respiratory infections among a group of military recruits. Fifteen recruits reported persistent cough, low-grade fever, and malaise. Apart from the low-grade fever, physical examination was largely unremarkable. Chest x-rays were all notable for pulmonary infiltrates that appeared more severe than what would have been expected based on assessment of the patients' clinical status. Sputum specimens were obtained, and the causative organism required a complex acellular medium enriched with cholesterol to grow. Which of the following organisms is the most likely cause of the outbreak?

- A. *Coccidioides immitis* (1%)
- B. *Coxiella burnetii* (1%)
- C. *Haemophilus influenzae* (2%)
- D. *Histoplasma capsulatum* (1%)
- E. *Klebsiella pneumoniae* (2%)
- F. *Legionella pneumophila* (8%)
- G. *Mycoplasma pneumoniae* (83%)
- H. *Pneumocystis jirovecii* (1%)
- I. *Streptococcus pneumoniae* (1%)

answer : g
id : 1679
lec 2

An 18-month-old boy is brought to the physician by his parents for fever, runny nose, and sore throat. The physician reassures the parents and recommends supportive care with plenty of fluids. He sends them home with instructions to follow up if the boy's symptoms worsen. Two days later, the infant is brought to the emergency department with persistent fever, brassy cough, and difficulty breathing. Physical examination reveals stridor. Which of the following pathogens is most likely responsible for this patient's condition?

- A. Rhinovirus (10%)
- B. Paramyxovirus (80%)
- C. Togavirus (4%)
- D. Parvovirus (4%)
- E. Calicivirus (2%)

answer : b
id : 1667
lec 7

A 34-year-old man with HIV comes to the emergency department due to fever, chills, productive cough, and left-sided chest pain that worsens with deep breathing. His symptoms began 3 days ago and have progressively worsened. The patient was diagnosed with HIV 4 years ago during routine screening, and he takes antiretroviral therapy. His CD4 count was 480 cells/mm a month ago. Temperature is 38.8 C (102 F), blood pressure is 110/66 mm Hg, pulse is 110/min, and respirations are 22/min. Physical examination shows dullness to percussion, bronchial breath sounds, and crackles over the left lower lung. The right lung and cardiac auscultation findings are normal. Laboratory testing reveals an elevated leukocyte count with left shift. Which of the following organisms is most likely responsible for this patient's current symptoms?

- A. *Aspergillus fumigatus* (6%)
- B. Influenza virus (1%)
- C. *Legionella pneumophila* (4%)
- D. *Mycobacterium tuberculosis* (6%)
- E. *Mycoplasma pneumoniae* (4%)
- F. *Pneumocystis jiroveci* (30%)
- G. *Streptococcus pneumoniae* (48%)

answer : g
id : 1767
lec 1

A previously healthy 43-year-old man comes to the office during the early fall due to a 4-week history of cough. He initially had a "bad cold" that lasted about 10 days. The sneezing, runny nose, and muscle aches that accompanied the cold have improved, but the cough has persisted and worsened. The patient has "bursts of coughing" for several minutes as he feels unable to clear the mucus. On at least 5 occasions, these attacks were so severe that he vomited afterward. The patient is a children's karate teacher. He received all of his childhood vaccinations but has not seen a physician in many years. There is no history of recent travel. Vital signs and physical examination are normal. Chest x-ray is unrevealing. Which of the following is the most likely cause of this patient's symptoms?

- A. Acid-fast bacillus (3%)
- B. Gram-negative coccobacillus (45%)
- C. Gram-positive diplococcus (16%)
- D. *Mycoplasma* (13%)
- E. RNA virus (22%)

answer : b
id : 11630
lec 1

A 68-year-old woman comes to the emergency department due to cough and shortness of breath. She has a history of chronic obstructive pulmonary disease and often coughs up clear sputum in the morning. Over the past 4 days, the cough has worsened significantly, and the patient now is producing thick, greenish sputum. She also feels winded when walking short distances or doing light housework. She is a former smoker with a 40-pack-year history. Temperature is 37.2 C (99 F), blood pressure is 130/70 mm Hg, pulse is 90/min, and respirations are 22/min. The patient is breathing with pursed lips. The expiration phase is prolonged. Vesicular breath sounds with diffuse wheezes are heard on lung auscultation. Chest x-ray shows hyperinflated lungs with a flattened diaphragm. There are no alveolar opacities or pleural effusions. Respiratory viral panel results are negative. Infection with which of the following pathogens most likely triggered this patient's worsening symptoms?

- A. *Bordetella pertussis* (6%)
- B. *Haemophilus influenzae* (35%)
- C. *Klebsiella pneumoniae* (18%)
- D. *Legionella pneumophila* (17%)
- E. *Staphylococcus aureus* (17%)
- F. *Streptococcus pyogenes* (7%)

answer : b
id : 14925
lec 9

A 64-year-old man comes to the emergency department due to 2 days of abrupt-onset fever, malaise, and myalgia. He has also had nasal discharge, sore throat, and a nonproductive cough. The patient has a history of hypertension and chronic obstructive pulmonary disease. He is a former smoker but does not use alcohol or illicit drugs. Temperature is 38.3 C (101 F), blood pressure is 130/70 mm Hg, pulse is 96/min, and respirations are 18/min. Physical examination shows watery nasal discharge, pharyngeal erythema, and clear lungs on auscultation. Droplet precautions are immediately instituted to prevent spread of the infection. Hand hygiene with an alcohol-based disinfectant following patient contact is also initiated. This patient's infecting pathogen is likely susceptible to the disinfectant due to the presence of which of the following characteristics?

- A. Lipid bilayer envelope (56%)
- B. Nucleocapsid proteins (10%)
- C. Segmented RNA genome (6%)
- D. Surface glycoproteins (19%)
- E. Surface ion channels (9%)

answer : a
id : 1377
lec 5

Researchers are studying mechanisms of human infection by animal viruses. The investigators induce random mutations in the genome of an avian influenza virus that is unable to infect humans but is structurally similar to human influenza A virus. A mutated isolate is found to be able to infect human upper respiratory tract epithelial cells. Alteration in which of the following viral components most likely enabled this novel strain to cause cross-species infection?

- A. Antigenic glycoprotein (55%)
- B. Lipid bilayer envelope (9%)
- C. mRNA endonuclease (6%)
- D. Nucleocapsid protein (24%)
- E. RNA polymerase (7%)

answer : a
id : 1411
lec 5

A 71-year-old man with chronic obstructive pulmonary disease (COPD) is hospitalized due to shortness of breath and wheezing. The patient is treated with bronchodilators and systemic corticosteroids for acute COPD exacerbation. His symptoms improve over the next 2 days. Before being discharged, an intramuscular vaccine containing inactivated viral components, which he normally receives annually, is administered. Several weeks later, the patient comes in close contact with an individual infected with the same virus contained in the vaccine. Which of the following is most likely to occur in this patient as a result of the vaccination?

- A. Destruction of infected cells by CD8⁺ T lymphocytes (44%)
- B. Impaired intracellular viral assembly (3%)
- C. Impaired release of viral progeny from cells (8%)
- D. Inhibition of viral entry into cells (40%)
- E. Inhibition of viral genome replication (5%)

answer : d
id : 1466
lec 5

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