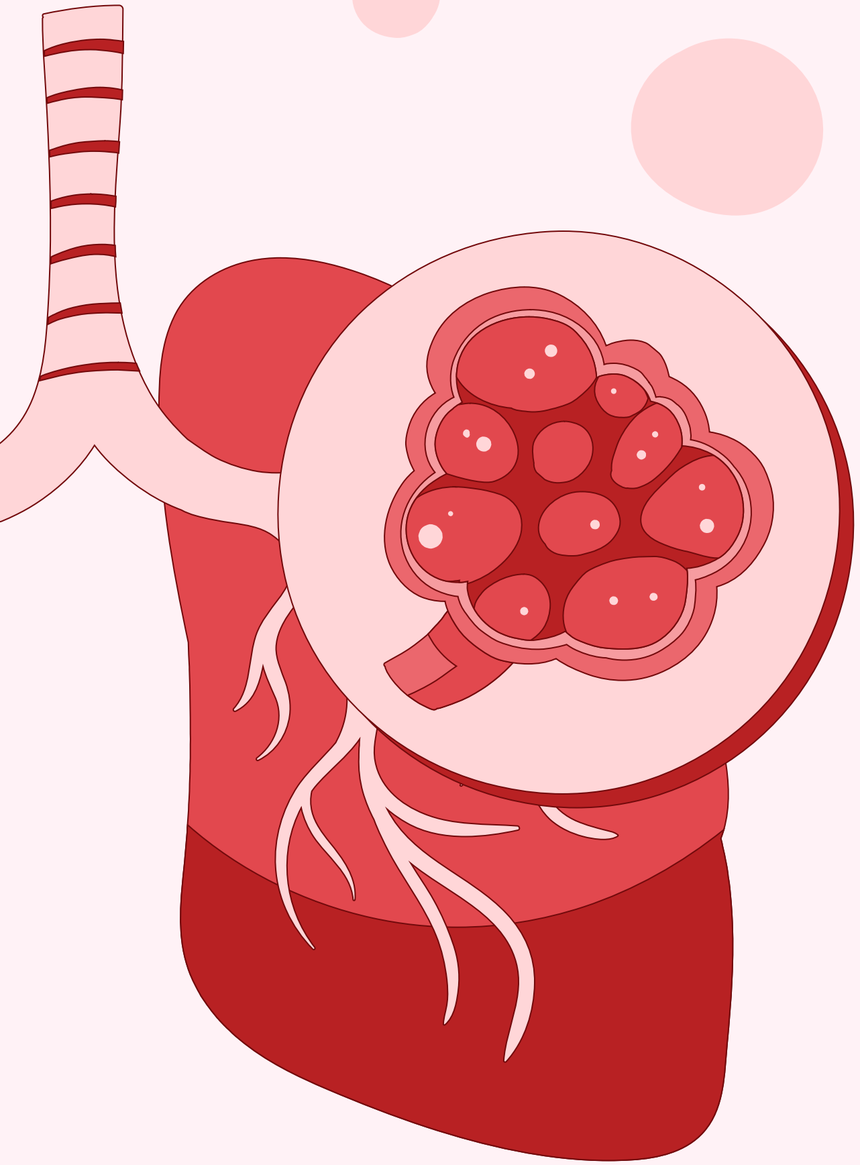


M3 R&C III
MED-223

(Question bankers Team)

DUA FOR STUDYING

{ اللَّهُمَّ انْفَعْنِي بِمَا عَلَّمْتَنِي وَعَلِّمْنِي مَا يَنْفَعُنِي وَزِدْنِي عِلْمًا }
{ اللهم إنّي أسالك فهم النّبيين، وحفظ المرسلين والملائكة المقرّبين }

Allâhumma infa’nii bimma ‘allamtani wa’allimnii maa yanfa’uunii wa zidni 'ilman
Allâhumma inii as’aluka fahmal-nabiyyen wa hifzal mursaleen al-muqarrabeen

Oh Allâh ! Make useful for me what you taught me and teach me knowledge that will be useful to me Oh Allâh !I ask you for the understanding of the prophets and the memory of the messengers and those nearest to you

DUA FOR STUDYING SOMETHING DIFFICULT

{ اللَّهُمَّ لاَ سَهْلاً إِلّاَ مَا جَعَلّتَهُ سَهْلاً وَأَنّتَ تَجّعَلَ الحَزَنَ إِذَا شِئتَ سَهْلاً }

Allâhumma lâ sahla illâ mâ ja‘altahu sahlâ wa anta taj‘alu al-hazana idhâ shi’ta sahlâ

Oh Allâh ! Nothing is easy except what You have made easy. If You wish, You can make the difficult easy

Pathology



L1. Pathology of emphysema and chronic bronchitis

1/ A 58-year-old **heavy smoker** presents with progressive **dyspnea and chronic cough.** Spirometry shows **decreased FEV_1/FVC ratio**. Which of the following best describes the underlying disease process?
A. Restrictive lung disease
B. Chronic obstructive pulmonary disease
C. Bronchiectasis
Answer: B. Chronic obstructive pulmonary disease

2/ Which of the following is the most common type of clinically significant emphysema found in **more than 95% of cases?**
A. Paraseptal (distal acinar)
B. Centriacinar (centrilobular)
C. Irregular
D. Panacinar (panlobular)
Answer: B. Centriacinar (centrilobular)

3/ A patient with ***α_1-antitrypsin deficiency*** presents with **dyspnea** and **lung hyperinflation**. Which form of emphysema is most likely seen?
A. Centriacinar
B. Panacinar
C. Paraseptal
Answer: B. Panacinar emphysema → Uniform enlargement of acini → Lower zones, anterior margins, associated with α_1-antitrypsin deficiency

4/ During autopsy of a patient with a long history of **smoking**, the lungs appear **large, voluminous, and overlap the heart anteriorly with flattening of the diaphragm.** On cut surface, **large alveoli** and **apical blebs are seen**. Microscopically, **abnormally large alveoli are separated by thin septa** showing **focal centriacinar fibrosis.** Which of the following best describes the condition?
A. Chronic bronchitis
B. Bronchiectasis
C. Emphysema
Answer: C. Emphysema

5/ A 65-year-old man, **heavy smoker**, presents with progressive **dyspnea**.
He is **thin**, sits leaning forward, **breathes through pursed lips,** and has a **barrel-shaped chest.** Arterial blood gas values are relatively normal at rest. Which of the following is the most likely diagnosis?
A. Chronic bronchitis
B. Bronchiectasis
C. Emphysema
Answer: Emphysema

6/ A 59-year-old man presents with a **persistent productive cough for the past 3 years.** He reports **sputum production for at least 3 months in each of the last 2 consecutive years.** There is no evidence of another underlying disease. What is the most likely diagnosis?
A. Asthma
B. Chronic bronchitis
C. Bronchiectasis
Answer: Chronic bronchitis

7/ A smoker's autopsy shows **hyperemia**, **swelling**, and **edema of bronchial mucosa with mucopurulent secretions filling bronchi and bronchioles.** Microscopic exam shows **chronic inflammation** of airways, peribronchial fibrosis, and **goblet cell hyperplasia**. What is the most likely diagnosis?
A. Chronic bronchitis
B. Bronchiectasis
C. Emphysema
Answer: Chronic bronchitis
🧠Gross → hyperemic, edematous mucosa with mucopurulent exudate.
🧠Microscopy → chronic inflammation, mucus plugging, fibrosis, goblet cell hyperplasia, thickened bronchiolar wall.

8/ A lung biopsy from a 62-year-old smoker with chronic productive cough shows the following findings:
- **Goblet cell hyperplasia**
- Marked narrowing of bronchioles caused by **mucus plugging,** inflammation, and **fibrosis**
- Obliteration of lumen (bronchiolitis obliterans) in severe areas
- **Enlargement** of mucus-secreting glands in trachea and bronchi
- **Reid index increased above 0.4**

Which of the following is the most likely diagnosis?
A. Bronchial asthma
B. Chronic bronchitis
C. Bronchiectasis
Answer: B. Chronic bronchitis

9/ A 60-year-old man with a long history of **heavy smoking presents** with **chronic productive cough** that has **persisted for several years**. He has **mild cyanosis, shortness of breath,** and arterial blood gas shows **hypercapnia and hypoxemia**. On examination, he appears overweight and slightly edematous, consistent with the **"blue bloater"** appearance. Which of the following is the most likely diagnosis?
A. Emphysema
B. Chronic bronchitis
C. Bronchiectasis
Answer: B. Chronic bronchitis

10/ A 63-year-old man with a **long history of smoking presents with progressive shortness of breath and chronic cough.** Physical exam reveals barrel-shaped chest and decreased breath sounds. Pulmonary function testing shows a **reduced FEV_1/FVC ratio (<0.7).** Which of the following is the most important diagnostic test confirming his disease?
A. Chest X-ray
B. Arterial blood gas analysis
C. Spirometry (COPD)
Answer: C. Spirometry

11/ A **heavy smoker** presents with **chronic productive cough.** Histologic exam of bronchi shows marked **increase in goblet cells, enlargement of submucosal glands,** and **mucus plugging.** Which mechanism primarily contributes to this disease?
A. Mucus hypersecretion due to *histamine and IL-13 stimulation*
B. Decrease in surfactant production
C. Excessive protease activity destroying alveolar septa
Answer: A. Mucus hypersecretion due to *histamine and IL-13 stimulation*

12/ A patient with **long-term smoking history** develops **irreversible enlargement of airspaces distal** to the **terminal bronchiole** with **destruction of their walls.** What is the most likely diagnosis?
A. Chronic bronchitis
B. Asthma
C. Emphysema
Answer: C. Emphysema

L1. Pathology of emphysema and chronic bronchitis past questions

1/ What best describes typical emphysema ?
A. Reversible destruction and thickening of the bronchi walls
B. Persistent cough with sputum production
C. Irreversible destruction and thickening of the bronchi walls
D. Airway enlargement and scarring

2/ Panacinar emphysema most commonly associated with which predisposing factor/deficiency ?
A. Smoking
B. Elastin
C. α1-antitrypsin deficiency
D. Surfactant protein C

3/ patient presents as a “blue bloater” with a productive, continuous cough. What is the most likely diagnosis ?
A/ Chronic bronchitis
B/ Emphysema
C/ Bronchiectasis
D/ Asthma

L2. Pathology of asthma and bronchiectasis

1/ An FEV1/FVC ratio below which of the following values is diagnostic of obstructive lung disease?
A. 0.4
B. 0.7
C. 4
D. 7
Answer: B. 0.7

2/ A 22-year-old man has **recurrent wheezing, cough, and chest tightness**, especially at **night and early morning**. Between **episodes he feels well**. What is the most likely diagnosis?
A. Chronic bronchitis
B. Emphysema
C. Asthma
D. Bronchiectasis
Answer: C. Asthma

3/ The most common clinically significant type of emphysema is?
A. Paraseptal (distal acinar)
B. Panacinar (panlobular)
C. Centriacinar (centrilobular)
D. Irregular
Answer: C. Centriacinar (centrilobular)

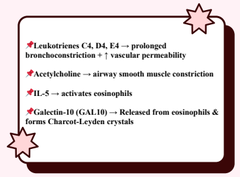
4/ Atopic asthma, the most common form, is caused by which mechanism?
A. Neutrophil response
B. Th2-IgE response
C. Autoimmune T-cells
D. Occupational exposure
Answer: B. Th2-IgE response

5/ Which cytokine is primarily responsible for activating eosinophils in asthma?
A. IL-4 *(Stimulates IgE production)*
B. IL-5 *(Activates eosinophils)*
C. IL-13 *(Stimulates mucus secretion)*
D. TNF-α
Answer: B. IL-5 → Activates eosinophils

6/ A **10-year-old** boy develops **wheezing and shortness** of breath after **exposure to dust**. His father also has a **history of asthma**. Skin testing with the suspected antigen is **positive**, and serum studies show **elevated total IgE levels**. Which of the following is the most likely diagnosis?
A. Non-atopic asthma
B. Atopic (extrinsic) asthma
C. Drug-induced asthma
D. Occupational asthma
Answer: B. Atopic (extrinsic) asthma

7/ A **30-year-old** man presents with **recurrent episodes of wheezing and shortness of breath**. He has **no family history of asthma**. Skin testing for allergens is **negative**. His symptoms often follow viral infections such as **rhinovirus**. Which of the following is the most likely diagnosis?
A. Atopic (extrinsic) asthma
B. Non-atopic (intrinsic) asthma
C. Drug-induced asthma
D. Occupational asthma
Answer: B. Non-atopic (intrinsic) asthma

8/ Which mediator causes **prolonged bronchoconstriction** and **increases vascular permeability** in asthma?
A. Acetylcholine
B. IL-5
C. Leukotrienes C4, D4, E4
D. Galectin-10
Answer: C. Leukotrienes C4, D4, E4

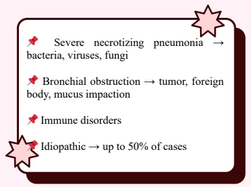


9/ A 15-year-old boy presents with persistent **chest tightness, dyspnea, wheezing, and coughing** (**sometimes with sputum**). These symptoms are present at a **low level most of the time**. Histology shows **airway remodeling**. What is the most likely diagnosis?
A. Chronic bronchitis
B. Emphysema
C. Atopic asthma
D. Bronchiectasis
Answer: C. Atopic asthma

L2. Pathology of asthma and bronchiectasis

10/ A patient develops a **paroxysm of wheezing and dyspnea** that persists for **several days**, causing **severe airflow obstruction** with marked **cyanosis**. In rare cases, the attack may be **fatal**. Which condition does this represent?
A. Chronic bronchitis
B. Acute severe asthma (status asthmaticus)
C. Non-atopic asthma
D. Drug-induced asthma
Answer: B. Acute severe asthma (status asthmaticus)

11/ A 12-year-old boy has recurrent respiratory infections since childhood. He is diagnosed with **cystic fibrosis.** Which category of underlying causes best explains this predisposition, also seen in conditions such as **primary ciliary dyskinesia** and **Kartagener syndrome**?
A. Severe necrotizing pneumonia
B. Bronchial obstruction
C. Immune disorders
D. Congenital or hereditary conditions
Answer: D. Congenital or hereditary conditions

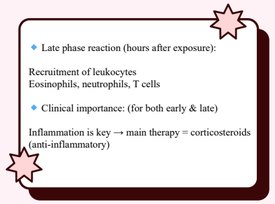


12/ During autopsy, the **lower lobes of both lungs** show markedly **dilated bronchi and bronchioles,** sometimes up to **four times normal size**. The affected airways appear cystic and are **filled with mucopurulent secretions.** Which of the following conditions best fits this description?
A. Chronic bronchitis
B. Bronchiectasis
C. Emphysema
D. Asthma
Answer: B. Bronchiectasis

13/ A lung biopsy from a patient with chronic cough and copious purulent sputum shows severe **acute and chronic inflammation, epithelial ulceration with squamous metaplasia**, **peribronchiolar fibrosis,** and partial to complete obliteration of small airways (**bronchiolitis obliterans**). What is the most likely diagnosis?
A. Asthma
B. Chronic bronchitis
C. Bronchiectasis
D. Emphysema
Answer: C. Bronchiectasis

14/ A 40-year-old man **presents with a long history of severe cough** producing **foul-smelling,** occasionally **bloody sputum**. He reports **frequent morning paroxysms of cough** and shortness of breath that worsen after upper respiratory infections. On exam, he has **dyspnea** and mild **cyanosis**. Which of the following is the most likely diagnosis?
A. Asthma
B. Chronic bronchitis
C. Bronchiectasis
D. Emphysema
Answer: C. Bronchiectasis

15/ In atopic asthma, which phase is characterized by **bronchoconstriction, increased mucus production, vasodilation, and increased vascular permeability**?
A. Late-phase reaction
B. Chronic phase
C. Early-phase reaction
D. Remodeling phase
Answer: C. Early-phase reaction



L2. Pathology of asthma and bronchiectasis
Past questions

1/ In which of the following diseases is the FEV1/FVC ratio decreased ?
A. Pneumoconiosis
B. Sarcoidosis
C. Bronchiectasis
D. Pulmonary fibrosis

2/ Late phase of reaction of asthma is primarily characterized by ?
A. Bronchoconstriction
B. Inflammation
C. Increased mucus production
D. Vasodilation

3/ Which of the following is primarily responsible for eosinophil recruitment ?
A. IL-13
B. IL-3
C. IL-4
D. IL-5

4/ A patient presents with wheezing, attacks occurring early in the morning or at night, and chest tightness. Which type of hypersensitivity is most likely responsible ?
A. Type I
B. Type II
C. Type III
D. Type IV

L3. Pathology of aneurysms

1/ What is the primary clinical sign that helps **differentiate** an **aneurysm** from other masses in the inguinal canal?
A. Soft compressible texture
B. Fixed immobile mass
C. Painful tender swelling
D. Presence of pulsation
Answer: D, Presence of pulsation

2/ How does **hypertension** contribute to **aneurysm development**?
A. Through inflammatory cell infiltration processes
B. Through direct mechanical vessel wall rupture
C. By causing medial ischemia in outer parts
D. By increasing matrix metalloprotease production
Answer: C, By causing medial ischemia in outer parts

3/ What characterizes **cystic medial degeneration** in **aneurysm** pathophysiology?
A. Accumulation of inflammatory cells in vessel intima
B. Thickening of smooth muscle layers in media
C. Loss of smooth muscle filled with glycosaminoglycans
D. Calcification deposits within arterial wall layers
Answer: C, Loss of smooth muscle filled with glycosaminoglycans

4/ In **Marfan Syndrome**, what underlying defect leads to **aneurysm** formation?
A. Increased matrix metalloprotease activity
B. Defective fibrillin protein structure
C. Defective Type III collagen synthesis
D. Altered collagen cross-linking mechanisms
Answer: B, Defective fibrillin protein structure

*Increased MMP activity:
Vasculitis & Atherosclerotic plaque
*Defective type III collagen synthesis:
Ehlers-Danlos syndrome
*Alterted collagen cross-linking mechanism
Scurvy (Vitamin C deficiency)

5/ **Atherosclerosis** leads to **aneurysm** formation primarily due to:
A. Increased matrix metalloproteinase activity
B. Medial ischemia (inner part)
C. Medial ischemia (outer part)
D. Both A&B
Answer: D, Both A&B

6/ A 27-year-old male with **Marfan syndrome** presents with chest pain and aortic root dilation on imaging. The most likely **histopathological finding** is:
A. Fibrinoid necrosis
B. Cystic medial degeneration
C. Lipid deposition
D. Intimal thickening
Answer: B, Cystic medial degeneration

7/ A man undergoes **interventional cardiac catheterization via the femoral artery**. A few days later, he develops a **pulsatile mass** at the puncture site. Imaging shows an **extravascular hematoma** that freely communicates with the arterial lumen. Which of the following best describes this condition?
A. False (pseudo) aneurysm
B. True saccular aneurysm
C. True fusiform aneurysm
D. Dissecting aneurysm
Answer: A, False (pseudo) aneurysm

8/ A 29-year-old **intravenous drug user** presents with a painful, pulsatile mass in the groin. The area is tender and warm. Doppler ultrasound shows an **infected (mycotic) aneurysm** involving the femoral artery.Which of the following could be the cause?
A. Atherosclerotic degeneration
B. Contaminated needles
C. Immune complex Deposition
D. Congenital weakness of the arterial wall
Answer: B, Contaminated needles

9/ A 35-year-old patient with a **congenital defect in the circle of Willis** presents with a saccular outpouching of a cerebral artery detected on imaging. Which of the following types of **aneurysm** is most likely present?
A. Fusiform aneurysm
B. Berry aneurysm
C. Mycotic aneurysm
D. False (pseudo) aneurysm
Answer: B, Berry aneurysm

10/ Which of the following combinations of aneurysm location and most important cause is correct?
A. Ascending aorta — Atherosclerosis
B. Ascending aorta — Hypertension
C. Abdominal aorta — Atherosclerosis
D. Abdominal aorta — Hypertension
Answer: B, Ascending aorta — Hypertension & C, Abdominal aorta — Atherosclerosis

L3. Pathology of aneurysms past questions

1/ What's the cause of aneurysm formation in scurvy ?
A. Defective synthesis fibrillin
B. Defective type III collagen synthesis
C. Defective elastin production
D. Defective cross linking of collagen

2/ A mass is pulsating in the femoral area after cardiac catheterization. What is the most likely cause of this aneurysm ?
A. Cystic medial degeneration
B. Weakness of all layers of blood vessels
C. Collection of blood on the adjacent wall
D. Hematoma formation

3/ A 60-year-old male presents with a pulsatile abdominal mass and back pain. What is the most common cause of an abdominal aortic aneurysm?
A. Atherosclerosis
B. Marfan syndrome
C. Hypertension
D. Syphilis

4/ What is the mechanism of action in an aneurysm due to atherosclerosis ?
A. Increased smooth muscle cell proliferation
B. Increase collagen production
C. Increase metalloprotease activity
D. Decreased lipid accumulation

5/ A 45-year-old male develops groin swelling and bruising after cardiac catheterization via femoral artery. What is the most likely diagnosis?
A. Extravascular Hematoma
B. Deep Vein Thrombosis
C. Arteriovenous Fistula
D. Hematoma Formation

6/ A 32 year-old male patient presented to the outpatient clinic complaining of painful swelling in the right groin. Examination revealed femoral artery aneurysm with overlying skin edema and redness. There are multiple marks of needle punctures at that area. Detailed history revealed he is a drug addict. What kind of aneurysm could it be as per the data mentioned above?
A. Mycotic
B. Congenital
C. Anastomotic
D. Degenerative

7/ A 60 year-old patient presents with an abdominal aortic aneurysm (AAA). What is the most common cause of this aneurysm ?
A. Scurvy
B. Marfan syndrome
C. Atherosclerosis leading to medial ischemia
D. Defective type III collagen synthesis

8/ In marfan syndrome, what is the underlying cause of aneurysm ?
A. Defective collagen II synthesis
B. Inadequate fibrillin synthesis
C. Increased metalloprotease (MMP) activity
D. Defective collagen III synthesis

9/ An elderly woman with a history of cardiac infarction and catheterization presents with a pulsatile mass on the left side. This is most likely indicative of which condition?
A. Pseudoaneurysm (Extravasion of blood)
B. Deep vein thrombosis
C. Aortic dissection
D. Pulmonary embolism

10/ What is the most common cause of death in a patient with a femoral artery aneurysm without obvious local signs in the groin ?
A. Retroperitoneal bleeding
B. External bleeding
C. Femoral nerve impingement
D. Infection

L3. Pathology of aneurysms past questions

11/ A 35 year-old male with a history of hypertension and Marfan syndrome presents with a sudden onset of severe chest pain in the anterior chest. He dies suddenly shortly after the episode. Histologic examination of the tissue reveals cystic medial degeneration. What is the most likely cause of this patient's sudden death ?

A. Thoracic aortic aneurysm
B. Mycotic aneurysm
C. Aortic dissection
D. Abdominal aortic aneurysm

12/ A patient underwent femoral artery catheterization and subsequently died. Which of the following is the most likely complication ?

A. Aortic dissection
B. Mycotic aneurysm
C. Hematoma extravasation
D. Saccular aneurysm

L4. Pathology of pneumonia and lung abscess

1/ A 55 y.o with **cystic fibrosis** develops fever and greenish sputum. Blood cultures show a **gram-negative** organism with a **tendency to invade blood vessels**. The likely agent is ?



Streptococcus pneumoniae (pneumococcus)	• Streptococcus pneumoniae (pneumococcus) is the most common cause of community-acquired acute pneumonia. • Pneumococcal vaccines containing capsular polysaccharides from the common serotypes are used in individuals at high risk for pneumococcal sepsis.
Haemophilus influenzae pneumonia	• May follow a viral respiratory infection, is a pediatric emergency and has a high mortality rate. • Most common bacterial cause of acute exacerbations of COPD.
Moraxella catarrhalis	• Moraxella catarrhalis is recognized as a cause of bacterial pneumonia, especially in the elderly.
Staphylococcus aureus	• Staphylococcus aureus is an important cause of secondary bacterial pneumonia in children and healthy adults following viral respiratory illnesses (e.g., measles in children and influenza in both children and adults). • Staphylococcal pneumonia is associated with a high incidence of complications, such as lung abscess and empyema.
Klebsiella pneumoniae	• Klebsiella pneumoniae is the most frequent cause of gram-negative bacterial pneumonia. • Afflicts debilitated and malnourished people, particularly chronic alcoholics. • Organism produces an abundant viscid capsular polysaccharide, which the patient may have difficulty expectorating. • Thick, mucoid (often blood-tinged) sputum is characteristic.
Pseudomonas aeruginosa	• Occurrence in cystic fibrosis and immunocompromised patients. • Common in neutropenic patients. • Has a propensity to invade blood vessels with consequent extrapulmonary spread.
Mycoplasma infections	• Common among children and young adults. • Occur sporadically or as local epidemics in closed communities (schools, military camps, and prisons).
Legionella pneumophila (Legionnaires' disease)	• Legionella pneumophila is the agent of Legionnaires' disease. • Also causes Pontiac fever, a related self-limited upper respiratory tract infection. • Organ transplant recipients are particularly susceptible. • Legionella pneumophila flourishes in artificial aquatic environments, such as water-cooling towers and the tubing systems of domestic (potable) water supplies.

A. Pseudomonas aeruginosa
B. Streptococcus pneumoniae
C. Haemophilus influenzae
D. Staphylococcus aure
Answer: A. Pseudomonas aeruginosa

2/ Which bacterial species is both a **pediatric emergency following viral infection** and the most frequent bacterial cause of **COPD exacerbation** ?
A. Staphylococcus aureus
B. Haemophilus influenzae
C. Pseudomonas aeruginosa
D. Legionella pneumophila
Answer: B. Haemophilus influenzae

3/ A 48 y.o with **poor dental hygiene** develops **productive cough with foul-smelling purulent sputum** and fever. Chest imaging shows a **cavity with an air-fluid level**. The most likely diagnosis is ?
A. Bronchiectasis
B. Empyema
C. Tuberculosis
D. Lung abscess
Answer: D. Lung abscess

4/ A **transplant recipient** develops **pneumonia** and **pontiac fever** 10 days after surgery. The organism is traced to **hospital water tanks**. Which of the following caused the complications ?
A. Haemophilus influenzae
B. Klebsiella pneumoniae
C. Legionella pneumophila
D. Mycoplasma pneumoniae
Answer: C. Legionella pneumophila

5/ A lung specimen appears **air-filled** after several days of treatment for pneumonia. Microscopy shows **intra-alveolar exudate break down into granular, semifluid debris by the action of proteolytic enzymes.** This material may then be **resorbed, ingested by macrophages, expectorated, or organized by fibroblasts growing into it.** Which stage of lobar pneumonia does this refer to ?
A. Congestion
B. Red hepatization
C. Gray hepatization
D. Resolution
Answer: D. Resolution

6/ A 45 y.o man presents with cough and fever. Microscopy of lung tissue shows **neutrophil-rich exudate, bilaterally basal consolidations** and **multiple focal opacities** on x-ray of the lobes. Which morphologic pattern does this describe ?
A. Lobar pneumonia
B. Bronchopneumonia
C. Viral pneumonia
D. Interstitial fibrosis
Answer: B. Bronchopneumonia

7/ Radiologic appearance of lobar pneumonia typically shows ?
A. Whole-lobe radiopaque consolidation
B. Patchy opacities
C. Cavitary nodules
D. Diffuse interstitial pattern
Answer: A. Whole-lobe radiopaque consolidation

8/ In viral pneumonia, **alveolar septa are widened** by mononuclear infiltrate and **edema**, causing **hypoxemia**. Main mechanism of hypoxemia ?
A. Bronchial obstruction
B. Mucus plugging
C. Ventilation–perfusion mismatch from interstitial edema
D. Surfactant loss
Answer: B. Ventilation–perfusion mismatch from interstitial edema

9/ Pneumonia occurring **within 48 hours** of hospitalization is considered ?
A. Healthcare-associated
B. Hospital-acquired
C. Community-acquired
D. Nosocomial
Answer: C. Community-acquired

10/ A 45 y.o man dies 12 hours after onset of high fever and productive cough. At autopsy, the lung is **heavy, boggy, and dark red**. Microscopically there is **vascular engorgement**, **intra-alveolar edema**, **few neutrophils**, and **numerous bacteria**. Which stage of lobar pneumonia does it represent ?
A. Congestion
B. Red hepatization
C. Gray hepatization
D. Resolution
Answer: A. Congestion

L4. Pathology of pneumonia and lung abscess past questions

1/ A patient with suspected lobar pneumonia complains of sharp chest pain that worsens with deep inspiration.Which clinical sign would best support the diagnosis of pleuritis ?
A. Wheeze
B. Crackles at lung bases
C. Amphoric breathing
D. Friction rub

2/ A patient presents with fever, cough, and dyspnea. Imaging shows a lung abscess. What is the most common underlying cause of this condition ?
A. Pulmonary embolism
B. Aspiration
C.Viral pneumonia
D. Hematogenous spread of bacteria

3/ Neutrophils, hemorrhage, and fibrin filling alveoli with red, firm, liver-like lung. This stage is ?
A. Congestion
B. Red hepatization
C. Gray hepatization
D. Resolution

4/ A 68 year-old woman presents with fever, dyspnea, and a productive cough with foul-smelling sputum. Chest X-ray reveals a cavity consistent with a lung abscess. What is the most common cause of this condition ?
A. Aspiration of infected material
B. Bronchial obstruction (e.g., tumor)
C. Septic emboli from right-sided endocarditis
D. Direct spread from adjacent pneumonia

5/ Patchy inflammation with exudate in bronchi and bronchioles is characteristic of ?
A. Lobar pneumonia
B. Bronchopneumonia
C. Interstitial pneumonia
D. Lung abscess

6/ Which of the following is the most common cause of community acquired pneumonia ?
A. Klebsiella pneumoniae
B. Moraxella catarrhalis
C. Streptococcus pneumonia
D. Mycoplasma infections

7/ Firm, airless, liver-like lung represents which stage of pneumonia ?
A. Resolution
B. Grey hepatization
C. Red hepatization
D. Congestion

L5. Vascular tumors

1/ A newborn female presents with a **soft, cystic swelling in the neck region.** The lesion transilluminates and contains **clear lymph fluid.** Genetic testing shows **Turner syndrome.** What is the most likely diagnosis?
A. Cavernous hemangioma
B. Lymphangioma
C. Capillary hemangioma
D. Pyogenic granuloma
Answer: B, Lymphangioma

2/ A 45-year-old woman has a large, deep, bluish-red lesion on her thigh. Microscopy shows **large dilated vascular** spaces **filled with RBCs** and **separated by scant connective tissue.** What should this patient be screened for?
A. Neurofibromatosis type 1
B. Von Hippel–Lindau disease
C. Sturge–Weber syndrome
D. Tuberous sclerosis
Answer: B, Von Hippel–Lindau disease

3/ A **50**-year-old man **with AIDS** presents with **multiple red-purple plaques** on the skin and mucosa. The lesions are **non-itchy** and may involve internal organs. Histology shows **spindle cells** forming vascular channels.Which of the following is the **causative agent**?
A. Human papillomavirus (HPV)
B. Epstein–Barr virus (EBV)
C. Human herpesvirus 8 (HHV-8)
D. Cytomegalovirus (CMV)
Answer: C, Human herpesvirus 8 (HHV-8)

4/ Which variant of **Kaposi's sarcoma** is the **most aggressive** and occurs in immunosuppressed patients after **organ transplantation**?
A. Classic (European) KS
B. Endemic (African) KS
C. AIDS-associated KS
D. Transplant-associated KS
Answer: D, Transplant-associated KS

5/ A **pregnant woman** in her second trimester develops a **bright red, pedunculated nodule** on her **gingiva** that **bleeds easily** when brushed. Histology shows **capillary proliferation in a lobular pattern**.What is the most likely diagnosis?
A. Capillary hemangioma
B. Cavernous hemangioma
C. Pyogenic granuloma
D. Pyogenic granuloma
Answer: D, Pyogenic granuloma

6/ A 70-year-old man presents with abdominal pain and hepatomegaly. He has a history of **exposure to vinyl chloride** in a chemical factory. Liver biopsy shows **anaplastic endothelial cells forming vascular channels.** What's the most likely Diagnosis?
A. Cavernous hemangioma
B. Capillary hemangioma
C. Angiosarcoma
D. Lymphangioma
Answer: C, Angiosarcoma

7/ A 2-year-old child has a raised red lesion on the face that appears in approximately 1 in every 200 births, it enlarged slowly and later regressed spontaneously. What's the most probable diagnosis?
A. Juvenile (capillary) hemangioma
B. Cavernous hemangioma
C. Lymphangioma
D. Kaposi's sarcoma
Answer: A, Juvenile (capillary) hemangioma

8/ A 55-year-old woman develops a **purplish, ulcerated lesion on her right arm**, several years **after undergoing radical mastectomy** with **axillary lymph node dissection** for breast cancer. What's the most likely diagnosis?
A. Lymphangioma
B. Lymphedema-associated angiosarcoma
C. Kaposi's sarcoma
D. Cavernous hemangioma
Answer: B, Lymphedema-associated angiosarcoma

9/ A 42-year-old **HIV-positive man** presents with **non-itchy purplish plaques** on his arms and palate. CT imaging shows hepatic and intestinal involvement. Which feature confirms this is the epidemic form?
A. Occurrence in elderly men
B. Localized plaques only
C. Dissemination to visceral organs in HIV infection
D. Association with immunosuppressive drugs
Answer: C, Dissemination to visceral organs in HIV infection

10/ What feature differentiates lymphangioma from capillary hemangioma?
A. Presence of spindle cells
B. Presence of blood clots
C. Presence of thick fibrous stroma
D. Absence of red blood cells in vascular spaces
Answer: D, Absence of red blood cells in vascular spaces

L5. Vascular tumors past questions

1/ Kaposi sarcoma in HIV -ve and affect the Lymph node?
A. Endemic African
B. Classical
C. Transplant-associated KS
D. AIDS-associated (epidemic) KS

2/ An agricultural worker with prolonged pesticide exposure presents with a liver mass. What is the likely diagnosis?
A. Hepatic Angiosarcoma
B. Hepatic Adenoma
C. Hepatocellular Carcinoma
D. Hemangioma

3/ Which histopathological feature is commonly associated with a hepatic vascular mass resulting from pesticide exposure ?
A. Lymphocyte infiltration
B. Pleomorphism and mitotic figures
C. Lobular capillary hemangioma
D. Not capsulated mass with advancing borders

4/ A 45-year-old male with HIV has multiple red-purple lesions. Which vascular tumor is associated with HHV-8?
A. Kaposi Sarcoma
B. Cavernous lymphangiomas
C. Pyogenic granulomas
D. Cavernous hemangiomas

5/ History of radical mastectomy with ipsilateral reddish tumor. What is the most likely diagnosis?
A. Angiosarcoma
B. Kaposi sarcoma
C. Cavernous lymphangiomas
D. Lymphangiomas

6/ A 24-year-old female presents with a red pedunculated lesion on her finger that bleeds easily (lobular hemangioma). What is the likely biopsy finding?

A. Lobular pattern with edema and inflammation representing granulation tissue or blood-filled spaces with inflammatory cell stroma
B. Cavernous hemangiomas
C. Juvenile hemangiomas
D. Capillary hemangiomas

7/ Which of the following is characteristic of cavernous hemangioma?
A. Blood-filled vascular spaces
B. Solid tumor with necrosis
C. Well-defined glandular structures
D. Lymphatic cysts

8/ Which vascular tumor is most commonly associated with turner syndrome ?
A. Hemangioma
B. Cavernous lymphangioma (cystic hygroma)
C. Kaposi sarcoma
D. Angiosarcoma

9/ Which vascular tumor is strongly associated with HHV-8 infection and is commonly seen in patients with HIV/AIDS ?
A. Hemangioma
B. Kaposi sarcoma
C. Cavernous lymphangioma
D. Angiosarcoma

10/ A tumor on the scalp, microscopically composed of thin walled capillaries separated by thin septa. What's the most likely diagnosis ?
A. Cavernous hemangioma
B. Capillary hemangioma
C. Pyogenic granuloma
D.Cavernous lymphangioma

L6. Pathology of hypertension and shock

1/ A 52-year-old man comes for a routine checkup. His average blood pressure readings over multiple visits are **135/92 mmHg.** He is otherwise healthy with no major symptoms. According to current criteria, which of the following best describes his blood pressure status?
A. Normal blood pressure
B. Borderline elevated
C. Hypertension
D. Malignant hypertension
Answer: C. Hypertension

- **Hypertension**→ systolic ≥130 mmHg or diastolic ≥90 mmHg.
- **Borderline elevated**→ systolic 120–130 mmHg; **Normal**→ <120/<80 mmHg.
- **Malignant hypertension**→ >180/120 mmHg with organ damage

2/ A 45-year-old woman presents with episodic **headache, sweating, and palpitations.** Her blood pressure is **190/120 mmHg,** and lab tests show **elevated catecholamines.** Which of the following best describes her condition?
A. Essential hypertension
B. Secondary hypertension
C. Borderline hypertension
Answer: B. Secondary hypertension

3/ A 46-year-old man presents with **severe headache and blurring of vision.**
His blood pressure is **200/125 mmHg.** Fundoscopic exam shows **retinal hemorrhages, exudates, and papilledema.** Lab results **reveal elevated serum creatinine.** Which of the following best describes this condition?
A. Essential hypertension
B. Secondary hypertension
C. Malignant hypertension
Answer: C. Malignant hypertension

4/ Which of the following substances primarily acts as a **vasoconstrictor** and increases peripheral vascular resistance in hypertension?
A. Angiotensin II
B. Nitric oxide (NO)
C. Kinins
Answer: A. Angiotensin II

- **Arterioles** → major regulators of peripheral resistance.
- **Vasoconstrictors** (↑ BP): 🧠 Angiotensin II, Catecholamines, Endothelin.
- **Vasodilators** (↓ BP): 🌿 Kinins, Prostaglandins, Nitric oxide (NO).

5/ The **epithelial sodium channels (ENaC)** in the kidney are tightly regulated by which of the following systems that controls blood pressure and sodium balance?
A. Sympathetic nervous system
B. Renin–angiotensin–aldosterone system (RAAS)
C. Natriuretic peptide system
Answer: B. Renin–angiotensin–aldosterone system (RAAS)

6/ When the **kidneys and heart** detect changes in **blood volume or pressure,** what do they do to restore homeostasis?
A. Undergo hypertrophy
B. Release inflammatory cytokines
C. Release hormonal effectors
Answer: C. Release hormonal effectors

7/ A patient with low renal perfusion develops **vasoconstriction**, **aldosterone release**, and **increased sodium reabsorptionas** compensatory mechanisms to restore blood pressure. These actions collectively represent which of the following?
A. Effects of nitric oxide
B. Effects of natriuretic peptides
C. Ang II effects
Answer: C. Ang II effects

8/ A patient with **elevated blood volume and pressure** has increased release of cardiac hormones that cause **vasodilationand inhibit sodium reabsorption, leading to natriuresis and diuresis.** Which of the following hormones are responsible for these effects?
A. Catecholamines
B. Atrial and B-type natriuretic peptide
C. Aldosterone
Answer: B. Atrial and B-type natriuretic peptide

9/ A 25-year-old patient is found to have **persistent hypertension** with **low plasma renin and low aldosterone levels. Genetic testing reveals a gain-of-function mutation in the ENaC** causing excessive sodium reabsorption in renal tubules. Which of the following best explains this condition?
A. Cushing syndrome
B. Liddle syndrome
C. Conn syndrome (primary hyperaldosteronism)
D. Pheochromocytoma
Answer: B. Liddle syndrome

10/ A patient presents with **hypotension**, **rapid weak pulse,** and **tachypnea**. The **skin is cool, clammy, and cyanotic**, while in other cases **(like sepsis)** it may appear **warm** and **flushed**. Young patients with prompt treatment show **>90% survival.**
Which of the following conditions best describes this clinical picture?
A. Heart failure
B. Shock
Answer: B. Shock

11/ A 50-year-old man with a **sedentary lifestyle, high-salt diet**, and **obesity** with **insulin resistance presents** with persistently **elevated blood pressure.**
He is also a **smoker and under chronic psychological stress.** Which of the following conditions best describes his underlying disease process?
A. Atherosclerosis
B. Coronary artery disease
C. Hypertensive vascular disease
Answer: C. Hypertensive vascular disease

12/ Which of the following vascular lesions is seen in chronic hypertension and diabetes and leads to **nephrosclerosis**?
A. Hyperplastic arteriosclerosis
B. Necrotizing arteriolitis
C. Hyaline arteriosclerosis
Answer: C. Hyaline arteriosclerosis

13/ Which of the following vascular lesions is seen in **severe or malignant hypertension,** showing **onion-skin** concentric thickening of arterioles leading to marked luminal **narrowing** and **end-organ ischemia**?
A. Hyaline arteriosclerosis
B. Hyperplastic arteriosclerosis
C. Necrotizing arteriolitis
Answer: B. Hyperplastic arteriosclerosis

14/ Which of the following lesions is characterized by **acute fibrinoid necrosis** of **arterioles,** is associated with **malignant hypertension**, and can lead to **acute renal failure?**
A. Hyaline arteriosclerosis
B. Hyperplastic arteriosclerosis
C. Necrotizing arteriolitis
Answer: C. Necrotizing arteriolitis

15/ A patient experiences circulatory failure resulting in tissue **hypoperfusion**, leading to **cellular hypoxia and initially reversible injury.** Which of the following terms best describes this condition?
A. Ischemia
B. Hypotension
C. Shock
Answer: C. Shock

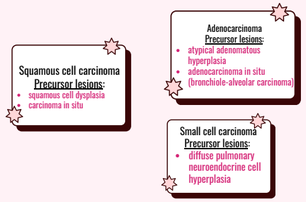
16/ Autopsy of a patient who died after **severe trauma** shows widespread **hypoperfusion** and **microvascular thrombosis**. Lesions are most prominent in the **brain, heart, kidneys, adrenals, and gastrointestinal tract,** and the lungs show diffuse alveolar damage **(“shock lung”)**. Which of the following conditions best explains these findings?
Answer: Shock

L6. Pathology of hypertension and shock past questions

1/ What's the most likely complication of malignant hypertension ?
A. Hyaline arteriosclerosis
B. Hyperplastic arteriosclerosis
C. Necrotizing arteriolitis
D. Hypovolemic shock

L7. Lung tumors

1/ Which **precursor lesion** is correctly paired with its tumor type?
A. Atypical adenomatous hyperplasia → Small cell carcinoma
B. Carcinoma in situ → Squamous cell carcinoma
C. Diffuse neuroendocrine cell hyperplasia → Adenocarcinoma
D. Bronchiole-alveolar carcinoma → Large cell carcinoma
Answer: B, Carcinoma in situ → Squamous cell carcinoma



2/ A 65-year-old chronic **smoker** presents with a **central lung mass located near the hilum**.
Histology shows **keratin pearls and intercellular bridges**.Which of the following is the most likely diagnosis?
A. Adenocarcinoma
B. Squamous cell carcinoma
C. Small cell carcinoma
D. Large cell carcinoma
Answer: B, Squamous cell carcinoma

3/ A **30-year-old non-smoking** woman presents with recurrent wheezing and cough.
Bronchoscopy reveals a smooth endobronchial polypoid lesion with a **"collar-button" appearance**.
Histology shows **uniform cells with neuroendocrine granules** and a **low mitotic rate**.
What is the most likely tumor?
A. Squamous cell carcinoma
B. Adenocarcinoma in situ
C. Small cell carcinoma
D. Carcinoid tumor
Answer: D, Carcinoid tumor

4/ A man with a history of renal cell carcinoma presents with cough and dyspnea. Chest X-ray shows **multiple round, well-circumscribed opacities ("cannon-ball" lesions)** scattered throughout both lungs.What do these findings indicate?
A. Primary adenocarcinoma
B. Secondary (metastatic) tumors
C. Bronchial carcinoid
D. Large-cell carcinoma
Answer: B, Secondary (metastatic) tumors

5/ The association of **tobacco smoking** is **strongest** for which types of bronchogenic carcinoma?
A. Adenocarcinoma and large cell carcinoma
B. Squamous and small cell carcinoma
C. Carcinoid and adenocarcinoma
D. Mesothelioma and adenocarcinoma
Answer: B, Squamous and small cell carcinoma

6/ A **35-year-old man**, **non-smoker**, presents with a persistent cough and wheezing. Microscopic examination shows uniform tumor cells with **"salt-and-pepper" chromatin** and no necrosis or significant mitotic activity.The pathologist reports that this is a **low-grade neuroendocrine tumor** of the lung.
Which of the following immunohistochemical markers would most likely be positive in this tumor?
A. Cytokeratin 5/6
B. TTF-1
C. Chromogranin and Synaptophysin
D. Desmin
Answer: C, Chromogranin and Synaptophysin

7/ A **70-year-old smoker** presents with cough, hemoptysis, and weight loss. CT shows a **central hilar mass** with obstruction of the **main bronchus**.This presentation is typical of which of the following?
A. Adenocarcinoma
B. Bronchogenic (squamous) carcinoma
C. Carcinoid tumor
D. Secondary metastatic tumor
Answer: B, Bronchogenic (squamous) carcinoma

8/A lung biopsy shows a poorly differentiated malignant epithelial tumor that is **negative for TTF-1 and Cytokeratin 5/6. No gland formation, keratin pearls, or neuroendocrine markers are seen.**
What is the most likely diagnosis?
A. Squamous cell carcinoma
B. Adenocarcinoma
C. Small cell carcinoma
D. Large cell carcinoma
Answer: D, Large cell carcinoma

9/ A heavy smoker man presents with cough, hemoptysis, and weight loss.CT shows a central hilar mass obstructing the bronchus. Histology confirms **squamous cell carcinoma** of the lung.
Which of the following **pathogenetic mechanisms** most likely contributed to this patient's disease?
A. Mutation in the BRCA2 gene responsible for DNA repair
B. Overexpression of estrogen receptors in bronchial epithelium
C. Inactivation of p53 and Rb tumor-suppressor genes
D. Chronic viral infection by human papillomavirus (HPV) type 16
Answer: C, Inactivation of p53 and Rb tumor-suppressor genes

10/ A chronic smoker presents with cough and hemoptysis.
Chest X-ray reveals a **hilar mass with central cavitation.**
Which of the following is the most likely **site of origin** of this lesion?
A. Alveolar septa
B. Main bronchus
C. Peripheral bronchiole
D. Pleural surface
Answer: B, Main bronchus

L7. Lung tumors past questions

1/ A 37 year old non-smoker presents with mild cough. Imaging shows a hilar mass with a collar button shaped appearance. What is the microscopic morphology of this tumor ?
A. Carcinoid tumor Salt and pepper in nuclei
B. Metastatic Tumors Hyperchromatic nuclei
C. Malignant Mesothelioma Desmosomes and dense cytoplasm
D. Adenocarcinoma Glandular differentiation and mucin production

2/ Tumor with mucin secreting and glandular pattern, what is the IHC ?
A. TTF1
B. CK5/6
C. Neuroendocrine markers
D. S100 protein

3/A 55-year-old woman, non-smoker, is diagnosed with lung adenocarcinoma. Which IHC marker is most likely positive?
A. TTF1
B. CK5/6
C. Neuroendocrine markers
D. S100 protein

4/ Lung tumor with **central cavitation.** What is the most likely diagnosis?
A. Adenocarcinoma
B. Squamous cell carcinoma
C. Adenosquamous carcinoma
D. Small cell carcinoma

5/ A woman presents with a high grade central lung carcinoma. Biopsy shows necrosis, tumor cells with scant cytoplasm, absent nucleoli, and finely granular chromatin. What is the most likely diagnosis ?
A. Adenocarcinoma
B. Squamous cell carcinoma
C. Small cell carcinoma
D. Large cell carcinoma

6/ A patient presents with a persistent cough, and imaging reveals a lung tumor with a **yellow-tan** cut surface and a **collar-button** appearance. What is the most likely type of lung tumor?
A. Adenocarcinoma
B. Small Cell Lung Cancer
C. Non-Small Cell Lung Cancer
D. Bronchial Carcinoid Tumor

7/ Which of the following markers is commonly positive in **small cell carcinoma** (**SCC**) on immunohistochemistry (IHC)?
A. Chromogranin
B. Synaptophysin
C. Neuron-specific Enolase (NSE)
D. All of the above

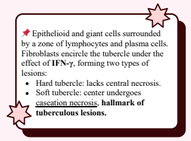
8/ Which IHC marker is most commonly positive in **carcinoid tumor** of the lung, which is known for its ectopic hormone production due to neurosecretory granules in tumor cells?
A. Chromogranin
B. TTF-1
C. CK5/6
D. P40

9/ Atypical adenomatous hyperplasia in the lung is considered a precursor lesion for which type of lung cancer ?
A. Squamous cell carcinoma
B. Small cell carcinoma
C. Adenocarcinoma
D. Large cell carcinoma

10/ A woman presents with a peripheral lung tumor showing mucin secretion and glandular differentiation. Which immunohistochemical marker is most appropriate?
A. TTF-1
B. CK5/6
C. Neuroendocrine markers
D. S100 protein

L8. Pathology of TB

1/ A lung lesion shows a **granuloma** with **epithelioid and giant cells, surrounded by lymphocytes, fibroblasts and plasma cells**. The **center** later becomes **necrotic** with **cheese-like material**. What best describes the progression ?



A. Soft tubercle → Hard tubercle
B. Hard tubercle → Soft tubercle
C. Exudative lesion → Granulomatous lesion
D. Granulomatous lesion → Exudative lesion
Answer: B. Hard tubercle → Soft tubercle

2/ Which deficiency would prevent **maturation of phagolysosomes** and impair **macrophage killing** of M.tuberculosis ?
A. IL-12
B. Exported repetitive protein
C. IFN-γ
Answer: C. IFN-γ

3/ Which bacterial factor of M.tuberculosis causes **phagosome maturation inhibition**, **blocks phagolysosome fusion**, and **promotes intracellular survival** ?
A. Nitric oxide
B. Complement receptor 3 (CR3)
C. Exported repetitive protein
Answer: C. Exported repetitive protein

4/ Which of the following receptors mediate the entry of M.tuberculosis into macrophages by phagocytosis during primary tuberculosis ?
A. Toll-like receptor 4 (TLR4)
B. Mannose binding lectin
C. Complement receptor 3 (CR3)
Answer: B. & C Mannose binding lectin & complement receptor 3 (CR3)

5/ A patient with a history of tuberculosis has a chest X-ray showing a **healed lesion with central calcification**. Which phase of tuberculosis does this represent ?
A. Granulomatous lesion phase
B. Exudative lesion phase
C. Fibrocalcific phase
Answer: C. Fibrocalcific phase

6/ Which of the following is a causes of caseation necrosis in tuberculosis ?
A. Delayed hypersensitivity reaction
B. Release of lymphotoxins from lymphocytes
C. Action of proteolytic enzymes from neutrophils
D. Relative central ischemia within granulomas
Answer: All the above

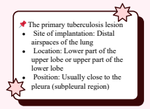
7/ The most commonly affected organs in systemic miliary TB are ?
A. Kidneys and brain
B. Liver, spleen, and bone marrow
D. Pleura and trachea
Answer: B. Liver, spleen, and bone marrow

8/ Which of the following accurately describe the early **(<3 weeks)** stage of primary tuberculosis ?
A. Acute inflammation attracting neutrophils (exudative phase)
B. Bacteremia with seeding of multiple sites
C. Macrophage rupture and host cell lysis
D. Asymptomatic or mild flu-like illness
Answer: All the above

9/ Which of the following immune responses occurs at **(>3 weeks)** stage of primary tuberculosis ?
A. Antigen presentation by MHC class II molecules to T cells
B. Mycobacterial antigens enter the draining lymph nodes
C. IL-12 mediated differentiation of T cells into TH1 cells
D. Recognition of mycobacterial lipoproteins and glycolipids by innate immune receptors (APCs&TLR2)
Answer: All the above

10/ Which phase of tuberculosis is characterized by **IFN-γ–activated macrophages** transforming into **epithelioid cells**, some fusing to form **Langhans' giant cells**, and releasing **TNF** and **chemokines** that **recruit monocytes** ?
A. Exudative lesion phase
B. Granulomatous lesion phase
C. Fibrocalcific phase
Answer: B. Granulomatous lesion phase

11/ A 28 y.o patient's chest X-ray shows a small **subpleural opacity** in the **upper part of the lower lobe**. Histologic examination reveals **consolidation** and **gray-white area with central caseation**. What's the diagnosis ?



A. Secondary cavitary tuberculosis
B. Ghon focus of primary tuberculosis
Answer: B. Ghon focus of primary tuberculosis

12/ The combination of a **parenchymal lung lesion** and **involved regional lymph nodes** in primary TB is called ?
A. Ghon focus
B. Ghon complex
Answer: B. Ghon complex

13/ In healed primary tuberculosis, the combination of a **fibrosis** and **radiologically detectable calcifications** is known as ?
A. Ghon complex
B. Ranke complex
C. Ghon focus
Answer: B. Ranke complex

14/ Which cytokine stimulates **macrophages to generate nitric oxide**, **reactive oxygen** and **nitrogen intermediates**, **peptides *(defensins)***, and **autophagy** during tuberculosis infection ?
A. IL-12
B. IFN-γ
C. TNF
Answer: B. IFN-γ

15/ A **67 y.o** man with a history of **untreated TB 20 years ago** presents with **chronic cough** and **hemoptysis**. Chest X-ray shows **apical cavitary lesions**. Histology reveals **extensive caseous necrosis** and **airways erosion**
What's the diagnosis ?
A. Miliary tuberculosis
B. Secondary tuberculosis
C. Primary tuberculosis
Answer: B. Secondary tuberculosis

16/ Erosion of a progressive pulmonary TB cavity into adjacent **bronchi** results in ?
A. Endobronchial TB
B. Edotracheal TB
C. Laryngeal TB
Answer: All the above

17/ Which **pleural** findings are associated with progressive pulmonary tuberculosis ?
A. Serous pleural effusion
B. Obliterative fibrous pleuritis
C. Tuberculous empyema
Answer: All the above

18/ Erosion of pulmonary **blood vessels** in progressive tuberculosis lead to?
A. Tuberculous empyema
B. Endotracheal TB
C. Hemoptysis and systemic miliary TB
Answer: C. Hemoptysis and systemic miliary TB

19/ A 40 y.o man with advanced TB shows **numerous 2-mm yellow-white nodules** scattered in his **liver, spleen and lung parenchyma** at autopsy. What is this condition called ?
A. Tuberculous empyema
B. Systemic miliary tuberculosis
C. Endobronchial TB
Answer: B. Systemic miliary tuberculosis

L8. Pathology of TB
past questions

1/What are the cells responsible for immunity in 2ry TB?
A. Memory T Cells
B. Th1
C. Activated macrophage

2/ TB with Ranke complex?
A. Calcification and fibrosis TB lesion
B. Necrosis and granulomatous inflammation
C. Cavitation and caseation necrosis
D. Hyperplasia and liquefaction of lung tissue

3/ Which cell is responsible for the rapid response in secondary TB?
A. Memory T Cells
B. Th1
C. Activated macrophage

4/ A 30-year-old male with TB and enlarged lymph nodes undergoes a biopsy. What is most likely to be found?
A. IFN-γ
B. Th1 cells
C. Giant Langhans cells
D. Caseating granulomas

5/ What is typically seen on a chest X-ray in secondary tuberculosis (TB) ?
A. Apical cavity lesion
B. Plural effusion
C. Area of consolidation
D. Bilateral pleural effusion

6/ The differentiation of Th1 cells depends on which of the following?
A. IL-12
B. IL-4
C. TGF-β
D. IL-10

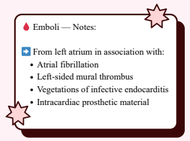
7/ Which of the following substances released by Mycobacterium tuberculosis inhibits the formation of the phagolysosome?
A. Exported repetitive protein
B. Phthiocerol dimycocerosate
C. Mycolic acid
D. Lipoarabinomannan

8/ Which type of tuberculosis is characterized by hematogenous spread, leading to widespread dissemination of the bacteria throughout the body?
A. Primary tuberculosis
B. Miliary tuberculosis
C. Latent tuberculosis
D. Extrapulmonary tuberculosis

L9. Pathology of ischemic heart disease

1/ Myocardial infarction without atherothrombosis may occur due to **cocaine or ephedrine** use causing sudden constriction of coronary arteries?
A. Emboli
B. Ischemia
C. Vasospasm
Answer: C. Vasospasm

2/ Myocardial infarction can result from obstruction of coronary arteries by material originating from the **left atrium** in **atrial fibrillation?**
A. Emboli
B. Vasospasm
C. Ischemia
Answer: A. Emboli

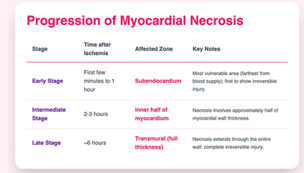


3/ Myocardial infarction may develop in patients with **vasculitis**, **sickle cell disease, aortic stenosis, or systemic shock** due to **reduced coronary flow?**
A. Vasospasm
B. Emboli
C. Ischemia
Answer: C. Ischemia

4/ Within a **few minutes** of the onset of myocardial ischemia, cells show **swelling of cell and mitochondrial swelling depletion of glycogen**, but the injury can still be reversed?
A. Infarction
B. Reversible injury
C. Necrosis
Answer: B. Reversible injury

5/ Only **severe ischemia** with blood flow reduced to **10% or less of normal,** lasting for **20–40 minutes** or **more**, leads to which type of **myocardial cell injury?**
A. Reversible injury
B. Irreversible injury
C. Functional impairment only
Answer: B. Irreversible injury

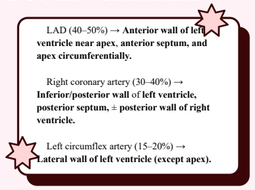
6/ During the **early stage of myocardial ischemia** (within the **first few minutes to 1 hour**), which region of the heart is the first to develop **irreversible injury (necrosis)**?
A. Transmural
B. Inner half of myocardium
C. Subendocardium
Answer: C. Subendocardium



7/ A myocardial infarction can occur **after plaque disruption** and formation of a coronary thrombus that becomes **lysed before necrosis extends** through the full thickness of the wall. What type of infarction does this describe?
A. Transmural infarction
B. Subendocardial (non-transmural) infarction
C. Silent infarction
D. Septal infarction
Answer: B. Subendocardial (non-transmural) infarction

8/ **Infarcts** are most frequently located in which chamber of the heart?
A. Right atrium
B. Right ventricle
C. Left atrium
D. Left ventricle
Answer: D. Left ventricle

9/ Which coronary artery is most commonly involved in myocardial infarction, typically causing infarcts of the **anterior wall of the left ventricle near the apex,** the **anterior portion of the ventricular septum, and the apex circumferentially?**
A. Right coronary artery
B. Left circumflex coronary artery
C. Left anterior descending (LAD) coronary artery
Answer: C. Left anterior descending (LAD) coronary artery



10/ Which of the following correctly describes the gross (N/E) and microscopic (M/E) morphologic progression of myocardial infarction over time?

Answer:



L9. Pathology of ischemic heart disease past questions

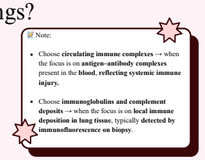
1/ A patient suffers from a **severe myocardial infarction** and **dues the next day (within 24 hours)**.
Which of the following histologic findings is most likely to be seen in the myocardial tissue ?

A. Granulation tissue formation
B. Ischemic coagulative necrosis
C. Fibrous scar formation
D. Neutrophil infiltration and phagocytosis of necrotic fibers

L10. Restrictive lung disease

1/ Which **type of restrictive lung disease** is characterized by **diffuse parenchymal involvement** of the lung and shows **interstitial ground-glass opacities** on chest radiograph?
A. Pleural disease
B. Interstitial and infiltrative disease (ILDs)
C. Chest wall deformity
Answer: B. Interstitial and infiltrative disease (ILDs)

2/ In **Idiopathic Pulmonary Fibrosis (IPF)**, the presence of **rheumatoid factor** and **antinuclear antibodies (ANA)** indicates which of the following findings?
A. High levels of autoantibodies
B. Elevated circulating immune complexes
C. Immunoglobulins and complement deposits on alveolar walls
Answer: A. High levels of autoantibodies



3/ In Idiopathic Pulmonary Fibrosis (IPF), the lungs are **firm, heavier, and have reduced volume**, showing **patchy interstitial fibrosis** with **heterogeneity** (areas of **new** fibroblastic foci beside **older** dense fibrosis) that finally lead to **honeycomb lung**. Which of the following describes this morphologic picture?
A. Usual Interstitial Pneumonia (UIP) pattern
B. Asbestosis
C. Sarcoidosis
Answer: A. Usual Interstitial Pneumonia (UIP) pattern

4/ A **40–70 year-old patient** develops **insidious dyspnea** on **exertion** and a **dry cough**, gradually progressing to **hypoxemia** and **cyanosis**. **Mean survival is 3 years or less**. **Lung transplantation** is the only definitive therapy. What's the diagnosis?
A. Asbestosis
B. Sarcoidosis
C. Idiopathic Pulmonary Fibrosis (Usual Interstitial Pneumonia pattern)
Answer: C. Idiopathic Pulmonary Fibrosis (Usual Interstitial Pneumonia pattern)

5/ Workers in **granite and rock-cutting factories** are exposed to **fibrogenic crystalline silica dust**, leading to the **formation of collagenous nodules** that may coalesce into a **dense scar**. This condition also increases susceptibility to **tuberculosis** due to depressed cell-mediated immunity. What's the disease?
A. Asbestosis
B. Silicosis
C. Coal worker's pneumoconiosis
Answer: B. Silicosis

6/ Workers in **fireproof clothes factories** develop a disease marked by **diffuse interstitial fibrosis** and the presence of **asbestos bodies** (characteristic **beaded, dumbbell-shaped fibers**). It is often associated with **pleural plaques**, which are **well-circumscribed areas** of **dense collagen** on the **pleura**. What is the most likely diagnosis?
A. Silicosis
B. Coal worker's pneumoconiosis
C. Asbestosis
Answer: C. Asbestosis

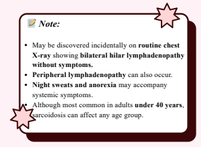
7/ In which disease are the **lungs common sites** of **involvement**, where in advanced cases the coalescence of granulomasforms **small palpable nodules** (1–2 cm), and **healing results in fibrosis at varying stages**?
A. Sarcoidosis
B. Silicosis
C. Asbestosis
Answer: A. Sarcoidosis

8/ In **sarcoidosis**, which **lymph nodes** are most commonly involved, appearing **enlarged, discrete,** and **sometimes calcified**?
A. Cervical lymph nodes
B. Axillary lymph nodes
C. Hilar and mediastinal lymph nodes
Answer: C. Hilar and mediastinal lymph nodes



9/ A biopsy from an enlarged lymph node shows **well-formed non-necrotizing granulomas** composed of epithelioid macrophages and giant cells. Some of these giant cells contain **Schaumann bodies** (laminated calcium–protein concretions) and **asteroid bodies**(stellate inclusions). What is the most likely diagnosis?
A. Tuberculosis
B. Sarcoidosis
Answer: B. Sarcoidosis

10/ A **35-year-old** patient presents with **gradual onset of dry cough, dyspnea, and chest pain.** Chest X-ray shows **bilateral hilar lymphadenopathy**, and examination reveals **cutaneous lesions and hepatosplenomegaly.** A **Kveim test is positive.** What is the most likely diagnosis?
A. Tuberculosis
B. Sarcoidosis
Answer: B. Sarcoidosis



11/ Which condition is characterized by **pulmonary infiltrates on chest radiographs** together with i**ncreased eosinophils** in peripheral blood?
A. Pulmonary Eosinophilia
B. Sarcoidosis
C. Tuberculosis
Answer: A. Pulmonary Eosinophilia

12/ Which type of **Pulmonary Eosinophilia** is caused by the **passage of parasitic larvae** through the lungs, such as in **filariasis, ascariasis,** or **strongyloidosis**?
A. Löeffler's syndrome *(simple, transient eosinophilic pneumonia).*
B. Tropical Pulmonary Eosinophilia
C. Secondary chronic eosinophilia *(due to drug reactions or associated with asthma).*
D. Acute eosinophilic pneumonia *(severe, with respiratory failure & of unknown cause).*
Answer: B. Tropical Pulmonary Eosinophilia

13/ In **Pulmonary Eosinophilia**, the **lesions in the lungs are**?
A. Variable in appearance from case to case
B. Similar in all cases
C. Limited to one lobe only
D. Always associated with cavitation
Answer: B. Similar in all cases

14/ **Grossly**, the **lungs in Pulmonary Eosinophilia usually show?**
A. Diffuse fibrosis
B. Patchy consolidation
C. Cystic honeycombing
D. Caseous necrosis
Answer: B. Patchy consolidation

15/ Microscopically, the **alveolar walls are thickened mainly by eosinophils,** and the **alveolar lumina also contain eosinophils.** Which of the following may occasionally be present?
A. Small granulomas
B. Giant cells with caseation
C. Fibrotic nodules
D. Necrotic abscesses
Answer: A. Small granulomas

L10. Restrictive lung disease past questions

1/ A patient presents with a skin rash, nontender joints, and increased interstitial opacity on imaging. If a sample is taken from the lungs, what would most likely be seen?
A. Central ischemic necrosis
B. Collagenous nodules
C. Multiple non necrotizing granulomas
D. Prescence of asbestos bodies

2/ Which of the following is a granulomatous lung disease ?
A. Restrictive lung disease
B. Hypersensitivity Pneumonitis
C. Pulmonary eosinophilia
D. Asbestosis

3/ What is characterized by patchy interstitial fibrosis with destruction of the alveolar space ?
A. Pulmonary eosinophilia
B. Sarcoidosis
C. Honeycomb lung
D. Pneumoconiosis

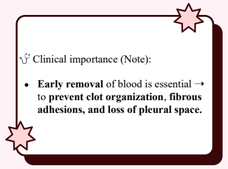
4/ A 28 year-old male presents with cough, wheezing, and mild dyspnea. Laboratory investigations reveal elevated eosinophilia count on peripheral blood, and chest X-ray shows pulmonary infiltrates.
What is the most likely etiopathology of his condition ?
A Inhaled mineral dust
B. Loeffler's syndrome
C. Pulmonary embolism
D. Rock cutting factories

L11. Pleural disease

1/ Which of the following causes pleural effusion due to **increased hydrostatic pressure?**
A. Congestive Heart Failure
B. Nephrotic Syndrome *(Decreased osmotic pressure)*
C. Pneumonia *(Increased vascular permeability)*
D. Mediastinal Carcinomatosis *(Decreased lymphatic drainage)*
Answer: A. Congestive Heart Failure

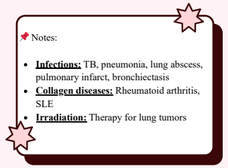
2/ A patient presents with **bilateral pleural effusion**. The **fluid is clear**, **straw-colored**, **non-inflammatory**, with specific gravity **below 1.012,** protein content **less than 1 g/dL**, and **very few cells.** The most common underlying cause is **congestive heart failure**, but it may also be seen in **renal failure, liver cirrhosis,** or **Meig's syndrome**. What is the diagnosis?
A. Empyema
B. Hemothorax
C. Chylothorax
D. Hydrothorax
Answer: D. Hydrothorax

3/ A patient presents with **accumulation** of **pure blood** in the **pleural cavity** following **chest trauma**. If **not removed early**, the blood may **clot and cause fibrous adhesions** leading to **obliteration of the pleural cavity**. What is the diagnosis?
A. Hydrothorax
B. Haemothorax
C. Chylothorax
D. Empyema
Answer: B. Haemothorax

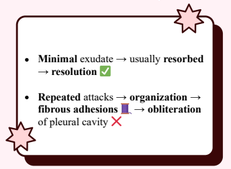


4/ Accumulation of **milky pleural fluid** that is **rich in triglycerides**, usually due to **thoracic duct rupture or obstruction by malignant lymphoma,** is called?
A. Hydrothorax
B. Haemothorax
C. Pyothorax
D. Chylothorax
Answer: D. Chylothorax

5/ The types of inflammatory pleural effusions according to the nature of **exudate** include?
A. Serous pleuritis
B. Fibrinous pleuritis
C.Serofibrinous pleuritis
Answer: All of the above

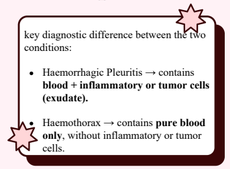


6/ A 45-year-old patient presents with **chest pain that worsens with breathing**. On auscultation, a **friction rub is heard**. What is the most likely diagnosis?
A. Hydrothorax
B. Hemothorax
C. Chylothorax
D. Pleurisy
Answer: D. Pleurisy



7/ Which pleural effusion is caused **mainly by pyogenic infection**, contains **yellow-green pus**, and may result in **fibrous adhesions and obliteration of the pleural cavity?**
A. Hemorrhagic Pleuritis
B. Suppurative Pleuritis (Empyema Thoracis)
C. Serofibrinous Pleuritis
D. Hydrothorax
Answer: B. Suppurative Pleuritis (Empyema Thoracis)

8/ A patient presents with pleural effusion containing **blood mixed** with **inflammatory cells** and **exfoliated tumor cells**. The condition is usually caused by **metastatic involvement of the pleura or rickettsial diseases**. What is the most likely diagnosis?
A. Hydrothorax
B. Haemothorax
C. Chylothorax
D. Haemorrhagic Pleuritis
Answer: D. Hemorrhagic Pleuritis



9/ **Air or gas** within the **pleural cavity**, leading to **lung collapse** and **respiratory distress**, is called?
A. Pleural effusion
B. Pneumothorax
C. Empyema
D. Hemothorax
Answer: B. Pneumothorax

10/ A patient develops pneumothorax following a **perforating injury** to the **chest wall.** Air enters the pleural cavity but may be **resorbed** if the **original communication seals itself**. This condition is classified as?
A. Idiopathic pneumothorax
B. Spontaneous pneumothorax
C. Traumatic pneumothorax
D. Serofibrinous pleuritis
Answer: C. Traumatic pneumothorax

L11. Pleural disease

11/ A **young patient** presents with **recurrent chest pain** and **dyspnea**. It is found to be due to **rupture** of **small apical subpleural blebs**. This form may complicate pulmonary diseases with **emphysematous** changes or lung **abscess** cavities that **directly communicate with the pleural space**. This condition is best described as?
A. Traumatic pneumothorax
B. Hemorrhagic pleuritis
C. Spontaneous pneumothorax
D. Hydrothorax
Answer: C. Spontaneous pneumothorax

12/ A patient presents with severe respiratory distress. During inspiration, **air enters the pleural cavity through a pleural defect**, but during expiration, the **air cannot escape** because the defect acts like a **flap valve**. As a result, intrapleural pressure **progressively increases**, leading to compression of the **mediastinum** and the **contralateral lung.** What is the most likely condition?
A. Spontaneous pneumothorax
B. Traumatic pneumothorax
C. Tension pneumothorax
D. Haemothorax
Answer: C. Tension pneumothorax

13/ A 60-year-old man presents with progressive shortness of breath and chest pain. He has a history of working in shipyards with **heavy exposure to asbestos** for more than 20 years. Imaging studies reveal a diffuse pleural mass encasing the lung. Biopsy shows a **malignant tumor arising from the mesothelial lining of the pleura**. Which of the following is the most likely diagnosis?
A. Primary bronchogenic carcinoma
B. Pleural fibroma
C. Malignant mesothelioma
D. Metastatic carcinoma to pleura
Answer: C. Pleural Tumors – Malignant Mesothelioma

14/ A **diffuse pleural lesion** with **extensive pleural effusion** is found grossly. The lung is **ensheathed** by a **thick layer of soft, gelatinous, grayish-pink tumor tissue.** What is the most likely diagnosis?
A. Pleural fibroma
B. Metastatic carcinoma to pleura
C. Empyema thoracis
D. Malignant Mesothelioma
Answer: D. Pleural Tumors – Malignant Mesothelioma

15/ Microscopic examination of a pleural tumor shows **epithelial, sarcomatoid, or biphasic patterns.Asbestos bodies** are also seen in the lungs of most patients with this condition.What is the most likely diagnosis?
A. Metastatic adenocarcinoma
B. Pleural fibroma
C. Empyema thoracis
D. Malignant Mesothelioma
Answer: D. Pleural Tumors – Malignant Mesothelioma

16/ A 65-year-old woman presents with shortness of breath and pleural effusion. Imaging shows **multiple small nodules scattered over the lung surface**. Biopsy reveals **metastatic malignant cells** in the pleura. Her medical history includes **breast carcinoma**, and metastasis occurred through **lymphatic spread**. What is the most likely diagnosis?
A. Pleural fibroma
B. Malignant mesothelioma
C. Secondary (Metastatic) Pleural Tumors
D. Empyema thoracis
Answer: C. Secondary (Metastatic) Pleural Tumors

Note: May also be associated with **ovarian cancers** via the **hematogenous route.**

L11. Pleural disease past questions

1/ Lung or pleural tumor with heavy exposure to asbestos. What is the most likely diagnosis ?
A. Pneumothorax
B. Metastatic pleura malignancy
C. Mesothelioma
D. Empyema thorax

5/ Chest X-ray showing pleural effusion. Which type is least likely to lead to adhesions ?
A. Hydrothorax
B. Hemothorax
C. Suppurative pleuritis (empyema thorax)
D. Pleurisy

3/ A patient died, and on autopsy the lung was found to be ensheathed in a soft, gelatinous, pink tumor. What is the most likely diagnosis ?
A. Hemorrhagic pleuritis
B. Malignant mesothelioma
C. Hydrothorax
D. Secondary pleural tumor

4/ A patient presents with pleural effusion and **elevated hydrostatic pressure**. What is the most likely cause?
A. Congestive heart failure
B. Nephrotic syndrome *(low osmotic pressure)*
C. Pneumonia *(high vascular permeability)*
D. Mediastinal Carcinomatosis *(low lymphatic drainage)*

5/ Bronchiectasis with radiotherapy 3 years develops a pleural effusion, what is the type of pleural effusion?
A. Hemorrhagic
B. Serofibrinous pleuritis
C. Hydrothorax

6/ What type of pleural effusion is typically seen in metastatic involvement of the pleura ?
A. Serofibrinous pleuritis
B. Suppurative pleuritis
C. Hemorrhagic pleuritis
D. Chylothorax

7/ What is the primary cause of pleural effusion in a 55-year-old man with a large bronchogenic carcinoma that has massively infiltrated the mediastinal structures ?
A. Increased vascular permeability
B. Decreased osmotic pressure
C. Increased hydrostatic pressure
D. Decreased lymphatic drainage

8/ A sample is taken from a patient's pleural fluid. The patient is suffering from right sided pleural effusion. Analysis of the sample reveals **low RBCs**, **high protein** and **WBC content**. Which of the following best describes the fluid ?
A. Transudate
B. Exudate *(Hemorrhagic Pleuritis)*

L12. Heart failure

1/ A 65-year-old male with **long-standing hypertension** presents with dyspnea on exertion and orthopnea. Echocardiography shows an **ejection fraction (EF) of 35%.**
Which of the following best describes his condition?
A. Right-sided heart failure with preserved EF
B. Left-sided systolic heart failure with reduced EF
C. Left-sided diastolic heart failure with preserved EF
D. High-output heart failure due to anemia
Answer: B, Left-sided systolic heart failure with reduced EF (N:>40%)

2/ Which of the following findings is most characteristic of **right-sided heart failure**?
A. Pulmonary congestion
B. Dyspnea on exertion
C. Peripheral edema
D. Orthopnea
Answer: C, Peripheral edema

3/ A 60-year-old man with **chronic obstructive pulmonary disease (COPD)** develops **hepatomegaly**, **jugular venous distension**, and **ankle edema**. Which of the following best explains the mechanism?
A. Left ventricular dysfunction
B. Cor pulmonale due to pulmonary hypertension
C. Mitral stenosis
D. High-output failure
Answer: B, Cor pulmonale due to pulmonary hypertension

4/ A woman presents with pulmonary edema and dyspnea. Histological examination of the lungs shows **hemosiderin-laden macrophages (heart failure cells).** These findings are most consistent with?
A. Right-sided heart failure
B. Cor pulmonale
C. High-output failure
D. Left-sided heart failure
Answer: D, Left-sided heart failure

5/ A woman with **untreated thyrotoxicosis** presents with palpitations and warm, flushed skin. Her **EF is normal**, but she shows **signs of heart failure**. What is the underlying mechanism?
A. High-output failure due to increased metabolic demand
B. Low-output failure due to contractility loss
C. Restrictive cardiomyopathy
D. Dilated cardiomyopathy
Answer: A, High-output failure due to increased metabolic demand

6/ A woman presents with dyspnea and pink frothy sputum. **On auscultation, you hear bilateral lung crackles.** Which of the following best explains her condition?
A. Right-sided failure → systemic congestion
B. Right-sided failure → hepatic congestion
C. Left-sided failure → pulmonary venous congestion
D. High-output failure → increased cardiac output
Answer: C, Left-sided failure → pulmonary venous congestion

7/ A man with **chronic obstructive pulmonary disease** presents with **ankle edema**, **jugular venous distension**, and **hepatomegaly**. On autopsy, his liver shows a **mottled pattern resembling a nutmeg.**
What is the underlying mechanism?
A. Passive congestion due to right-sided heart failure
B. Fatty change due to alcoholism
C. Portal vein thrombosis
D. Biliary obstruction
Answer: A, Passive congestion due to right-sided heart failure

8/ A man presents with dyspnea, fatigue, and **leg swelling**. There is **no pulmonary congestion**, but imaging shows multiple small clots within the pulmonary arterial branches. What is the most probable cause of his **right-sided failure**?
A. Chronic systemic hypertension
B. Mitral regurgitation
C. Recurrent pulmonary thromboemboli
D. Aortic stenosis
Answer: C, Recurrent pulmonary thromboemboli

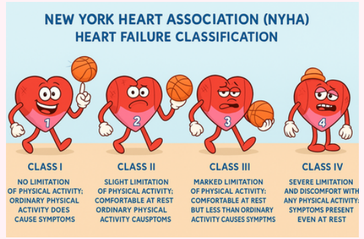
9/ A woman with a history of rheumatic **mitral stenosis** presents with dyspnea, **ankle edema**, and **hepatomegaly**. She has **no** evidence of left ventricular failure, but **pulmonary pressures are markedly elevated.** What cardiac condition has she developed as a complication of mitral stenosis?
A. Right-sided heart failure
B. Left-sided heart failure
C. High-output heart
D. Constrictive pericarditis
Answer: A. Right-sided heart failure

10/ A patient with **right-sided heart failure** develops **pitting edema, ascites, and enlarged liver**. These manifestations are primarily due to which of the following?
A. Increased cardiac output
B. Decreased cardiac contractility
C. Congestion of peripheral tissues
D. Pulmonary venous congestion
Answer: C, Congestion of peripheral tissues

L12. Heart failure past questions

1/ A 53 year-old patient presented with symptoms of heart failure **without exertion**. According to New York Heart Association (NYHA) Classification, what is the class of this patient ?

A. Class I
B. Class IV (severe)
C. Class II
D. Class III



2/ A patient presents with dyspnea, cyanosis, and crackles in both lungs.
What is expected to be seen?

A. Hypertrophy of the left ventricle
B. Pulmonary embolism
C. Aortic dissection
D. Pericardial effusion

3/ A patient with a history of recurrent blood clots presents with signs of right-sided heart failure. What is the most likely cause?

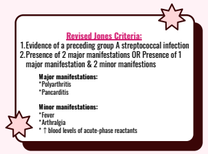
A. Chronic obstructive pulmonary disease
B. Recurrent pulmonary thromboemboli
C. Left-sided heart failure
D. Myocardial infarction

4/ A patient with left-sided heart failure complains of increased shortness of breath 1 to 3 hours after sleep. What is the most likely cause?

A. Pulmonary congestion
B. Asthma exacerbation
C. Acute pulmonary embolism
D. Chronic obstructive pulmonary disease

L13. Rheumatic fever

1/ A 12-year-old boy presents with **fever**, **migratory polyarthritis**, and a new **heart murmur 3 weeks after recovering from streptococcal pharyngitis**. Which diagnostic criteria are used to confirm the diagnosis of **Rheumatic Fever**?



A. Duke criteria
B. Modified Centor criteria
C. Revised Jones criteria
D. WHO infective endocarditis criteria
Answer: C, Revised Jones criteria

2/ Which of the following best describes the **pathogenesis of rheumatic fever**?
A. Direct invasion of cardiac tissue by Streptococcus pyogenes
B. Immune response to streptococcal antigens cross-reacting with host tissues
C. Toxin-mediated endothelial injury
D. Bacterial colonization of the heart valves
Answer: B, Immune response to streptococcal antigens cross-reacting with host tissues

3/ A 10-year-old girl develops fever and painful swelling of her knees, followed days later by chest pain and palpitations. Echocardiography shows **pancarditis** and **small vegetations along the line of closure of the mitral valve**. Which of the following histologic findings is most characteristic of this condition?
A. Fibrinoid necrosis surrounded by eosinophils
B. Neutrophilic abscesses with bacterial colonies
C. Granulomas with caseous necrosis and Langhans giant cells
D. Aschoff bodies composed of Anitschkow (“caterpillar”) cells
Answer: D, Aschoff bodies composed of Anitschkow (“caterpillar”) cells

4/ A man develops **sudden acute heart failure** due to **rupture of a papillary muscle** following a myocardial infarction.Which term best describes the mechanism of his valvular dysfunction?
A. Valvular stenosis
B. Valvular insufficiency
C. Primary leaflet injury
D. Calcific degeneration of the valve
Answer: B, Valvular insufficiency

5/ In **rheumatic heart disease**, what typically happens to the **left ventricle** in **isolated mitral stenosis**?
A. Complete atrophy
B. Immediate failure
C. Largely unaffected
D. Significant hypertrophy
Answer: C, Largely unaffected

6/ A patient presents with dyspnea and fatigue. Echocardiography shows thickened mitral valve leaflets and fused tendinous cords. Which of the following morphologic features supports a diagnosis of **chronic rheumatic heart disease**?
A. Commissural fusion and leaflet thickening
B. Aschoff body formation
C. Verrucae along the line of valve closure
D. Myxomatous degeneration of valve leaflets
Answer: A, Commissural fusion and leaflet thickening

7/ What hemodynamic consequence results from **valvular stenosis** versus **valvular insufficiency**?
A. Both conditions mainly produce volume overload with similar clinical outcomes
B. Stenosis leads to pressure overload while insufficiency causes volume overload
C. Both stenosis and insufficiency primarily result in pressure overload patterns
D. Stenosis causes volume overload while insufficiency leads to pressure overload
Answer: B, Stenosis leads to pressure overload while insufficiency causes volume overload

8/ A woman with **rheumatic heart disease** undergoes autopsy. Histologic examination of the **left atrial endocardium** reveals **irregular subendocardial thickening adjacent to regurgitant jets**. What is this lesion called?
A. MacCallum plaque
B. Aschoff body
C. Janeway lesion
D. Vegetation
Answer: A, MacCallum plaque

9/ A woman with a history of **rheumatic fever** in childhood presents with hemoptysis and signs of **right-sided heart failure**. Echocardiography reveals **calcification** and **“fish-mouth” stenosis** of the **mitral valve.** This valvular deformity represents which **stage** of **rheumatic heart disease**?
A. Acute rheumatic carditis
B. Chronic rheumatic heart disease
C. Subacute bacterial endocarditis
D. Congenital mitral stenosis
Answer: B, Chronic rheumatic heart disease

Mitral insufficiency:	• myxomatous degeneration in mitral valve prolapse • left ventricular dilation: (ischemic/ nonischemic) heart failure
Mitral stenosis:	• rheumatic heart disease (RHD)
Aortic insufficiency:	• dilation of ascending aorta (2ry to aging/HTN)
Aortic stenosis:	• calcification & sclerosis of normal tricuspid aortic valve • calcification & sclerosis of congenital bicuspid aortic valve

10/ Which of the following is the most frequent cause of **mitral insufficiency**?
A. Rheumatic heart disease (RHD)
B. Dilation of the ascending aorta
C. Calcification and sclerosis of a bicuspid aortic valve
D. Myxomatous degeneration in mitral valve prolapse (MVP)
Answer: D, Myxomatous degeneration in mitral valve prolapse (MVP)

L13. Rheumatic fever past questions

1/ A 35 y.o woman with a past history of **rheumatic fever** has **mitral stenosis** with calcification and fibrous thickening forming a “fish mouth” appearance.
Which of the following complications is most likely in this patient ?
A. Infective endocarditis
B. Myocardial rupture
C. Mural thrombi
D. Pulmonary hypertension

2/ A patient dies from rheumatic **heart disease (RHD)**. The family requests an autopsy to confirm the diagnosis. Which of the following microscopic findings is most specific for RHD ?
A. Aschoff bodies

3/ One of the major criteria of rheumatic fever ?
A/ Migratory polyarthritis

L14. Valvular heart diease

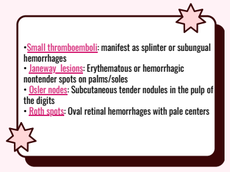
1/ A 45-year-old woman presents with **exertional dyspnea**. Echocardiogram shows a "**button-hole**" **mitral orifice**. What is the most likely cause?
A. Calcific aortic stenosis
B. Rheumatic mitral stenosis
C. Mitral valve prolapse
D. Endocardial fibroelastosis
Answer: B, Rheumatic mitral stenosis

2/ **Calcific aortic stenosis** most commonly results from:
A. Rheumatic fever
B. Age-related "wear and tear"
C. Congenital parachute mitral valve
D. Bacterial infection
Answer: B, Age-related "wear and tear"

3/The site of **calcium deposition** in **calcific aortic stenosis is**:
A. Free edge of the cusps
B. Commissures
C. Sinuses of Valsalva
D. Fibrous annulus
Answer: C, Sinuses of Valsalva (D. Fibrous annulus in Mitral annular Calification)

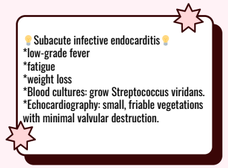
4/ **Calcific stenosis** of a **congenitally bicuspid aortic valve** typically shows:
A. Vegetations
B. "Button-hole" orifice
C. Fused commissures
D. Raphe formation
Answer: D, Raphe formation

5/ A patient presents with **splinter hemorrhages and painless red lesions on palms and soles.**Which of the following terms describes these lesions?
A. Small thromboemboli
B. Janeway lesions
C. Osler nodes
D. Roth spots
Answer: B, Janeway lesions

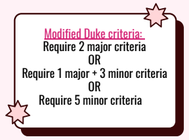


6/ A man presents with **fever**, malaise, and a **newly developed cardiac murmur**. Blood cultures are positive for bacteria. What is the most likely diagnosis?
A. Rheumatic fever
B. Infective endocarditis
C. Myocardial infarction
D. Pericarditis
Answer: B, Infective endocarditis

7/ A man with bicuspid aortic valve develops **high fever** and **malaise**. Blood cultures grow **Staphylococcus aureus**. Echocardiography shows **large, friable vegetations** and **ring abscesses.** Which is the correct diagnosis?
A. Acute infective endocarditis
B. Subacute infective endocarditis
C. Non-bacterial thrombotic endocarditis
D. Rheumatic heart disease
Answer: A, Acute infective endocarditis



8/ A woman presents with prolonged fever and weight loss. Echocardiography shows **vegetations on the aortic valve**. **Modified Duke criteria** are applied. Which of the following statements is TRUE regarding these criteria?
A. Require 1 major + 2 minor criteria
B. Require 1 major + 3 minor criteria
C. Used for rheumatic fever
D. Based solely on echocardiography
Answer: B, Require 1 major + 3 minor criteria



9/ A 60-year-old man with **untreated infective endocarditis** develops sudden hemiplegia. Which **complication** most likely occurred?
A. Septic embolization to the brain
B. Valve calcification
C. Fibrinoid necrosis
D. Cardiac tamponade
Answer: A, Septic embolization to the brain

10/ What is the key histological change observed in **mitral valve prolapse** that weakens the valve structure?
A. Chronic inflammatory cell infiltration throughout valve leaflets
B. Fibrous adhesions between the mitral valve leaflets
C. Myxomatous degeneration of the spongiosa layer with matrix deposition
D. Calcific deposits forming within the valve commissures
Answer: C, Myxomatous degeneration of the spongiosa layer with matrix deposition

L15. Cardiomyopathy

1/ A **35-year-old man** presents with progressive dyspnea and fatigue. Echocardiography shows **dilatation of all four cardiac chambers** with reduced **systolic function** and **mural thrombi.** Which of the following is the most likely diagnosis?
A. Restrictive cardiomyopathy
B. Hypertrophic cardiomyopathy
C. Dilated (Congestive) cardiomyopathy
Answer: C. Dilated (Congestive) cardiomyopathy

2/ In Dilated cardiomyopathy, which of the following mechanisms best explains the term **hypocontraction**?
A. Decreased myocardial contractility (systolic failure)
B. Increased ventricular stiffness
C. Increased ejection fraction
Answer: A. Decreased myocardial contractility (systolic failure)
🧠 hypocontraction = congestive heart failure due to systolic dysfunction

3/ A 25-year-old woman with a history of **peripartum** cardiomyopathy develops heart failure **postpartum**. Which of the following describes the mechanism of her condition?
A. Hypertrophy with obstruction of outflow tract
B. Dilatation of chambers leading to systolic dysfunction
C. Deposition of amyloid in myocardium
Answer: B. Dilatation of chambers leading to systolic dysfunction

4/ A 22-year-old **athlete suddenly collapses during exercise and dies**. Autopsy shows **asymmetric septal hypertrophy** and systolic anterior motion of the mitral leaflet. What is the most likely underlying condition?
A. Hypertrophic cardiomyopathy (HCM)
B. Restrictive cardiomyopathy
C. Dilated cardiomyopathy
Answer: A. Hypertrophic cardiomyopathy (HCM)

5/ Which of the following best explains the term **hypercontractile** but **poorly compliant** heart seen in hypertrophic cardiomyopathy?
A. Systolic dysfunction
B. Diastolic dysfunction due to stiff ventricular wall
C. Aortic stenosis
Answer: B. Diastolic dysfunction due to stiff ventricular wall

6/ A microscopic examination of the myocardium in a young athlete who died suddenly reveals marked myocyte hypertrophy with **myofiber disarray**. Which of the following is the diagnosis?
A. Restrictive cardiomyopathy
B. Hypertrophic cardiomyopathy
C. Dilated cardiomyopathy
Answer: B. Hypertrophic cardiomyopathy

7/ A 68-year-old man presents with diastolic heart failure. Endomyocardial biopsy shows **subendocardial deposits** of **misfolded insoluble protein** that stain with **Congo red.** What is the most likely cause?
A. Cardiac amyloidosis
B. Endocardial fibroelastosis
C. Löffler's endocarditis
Answer: A. Cardiac amyloidosis

8/ A 1-year-old **infant** develops heart failure. On autopsy, the **endocardium** is thick, rigid, and **pearly-white, mainly in the left ventricle.** Microscopically, there is proliferation of **collagen and elastic tissue** without inflammation. Which of the following is the diagnosis?
A. Endocardial fibroelastosis
B. Dilated cardiomyopathy
C. Löffler's endocarditis
Answer: A. Endocardial fibroelastosis

9/ A patient with long-standing **eosinophilia** develops **fibrosis** and **inflammation** of the endocardium, resulting in **stiff** and noncompliant ventricles.
Which of the following best describes this condition?
A. Löffler's endocarditis
B. Amyloidosis
C. Sarcoidosis
Answer: A. Löffler's endocarditis

10/ A 55-year-old male with a history of **multiple blood transfusions and hemoglobinopathy** develops restrictive cardiomyopathy. Which of the following is the most likely underlying cause?
A. Hemochromatosis (iron overload)
B. Amyloidosis
C. Scleroderma
Answer: A. Hemochromatosis (iron overload)

L15. Cardiomyopathy past questions

1/ A 10 month-old girl is brought to the hospital with diastolic dysfunction. What is the most likely diagnosis ?
A. Dilated cardiomyopathy
B. Hypertrophic cardiomyopathy
C. Endocardial fibroelastosis
D. Congenital heart disease

2/ Sudden unexplained death in young athletes common in which of the following types of cardiomyopathy ?
A. Hypertrophic
B. Dilated
C. Restrictive

3/ Compression of the left ventricle into a banana shape is characteristic of which condition?
A. Hypertrophic cardiomyopathy
B. Aortic stenosis
C. Restrictive cardiomyopathy
D. Constrictive pericarditis

4/ Which of the following is a common cause of restrictive cardiomyopathy?
A. Hypertrophic cardiomyopathy
B. Dilated cardiomyopathy
C. Amyloidosis
D. Ischemic heart disease

5/ A patient's echocardiography reveals dilation of all four chambers of the heart and systolic dysfunction. What is the most likely diagnosis?
A. Restrictive cardiomyopathy
B. Dilated (Congestive) cardiomyopathy
C. Hypertrophic cardiomyopathy
D. Ischemic cardiomyopathy

Biochemistry



L1. Hemoglobinopathies

1/ A patient with **sickle cell anemia** is started on **hydroxyurea**. What is the primary mechanism by which this medication reduces the frequency of sickling crises ?
A. It increases the oxygen-carrying capacity of HbS
B. It increases the production of fetal hemoglobin (HbF)
C. It acts as an electron donor to reduce methemoglobin
D. It repairs the membranes of damaged red blood cells
Answer: B. It increases the production of fetal hemoglobin (HbF)

2/ A patient is found to have a **mild**, **chronic hemolytic anemia** without any history of painful vaso-occlusive crises. Electrophoresis confirms **homozygous Hemoglobin C (HbCC)** disease. The mutation responsible for this condition is the **substitution of glutamic acid** with which amino acid **at position 6 of the β-globin** chain?
A. Valine
B. Alanine
C. Proline
D. Lysine
Answer: D. Lysine

3/ Which of the following conditions would be expected in a patient who has a **deletion of 3 out of the 4 α-globin genes**?
A. Silent carrier state with no clinical symptoms
B. β-thalassemia major
C. Hemoglobin H (HbH) disease
D. Hydrops fetalis
Answer: C. Hemoglobin H (HbH) disease

4/ / A newborn is diagnosed with a **severe form of α-thalassemia** characterized by the presence of **Hb Bart's**. This abnormal hemoglobin is composed of which of the following globin chains?
A. Four beta (β_4) chains
B. Four gamma (γ_4) chains
C. Four alpha (α_4) chains
D. Two alpha (α_2) and two delta (δ_2) chains
Answer: B. Four gamma (γ_4) chains

5/ A 1 year old child develops **severe anemia several months after birth**. Laboratory studies show **increased HbF and HbA_2**. Which of the following is the most likely diagnosis ?
A. β-thalassemia major
B. α-thalassemia trait
C. HbC disease
D. Iron deficiency anemia
Answer: A. β-thalassemia major

6/ A hiker in a rural area drinks untreated well water and later presents to the emergency department with shortness of breath and a notable **brownish-blue discoloration of his skin** and **mucous membranes**. His blood is drawn and appears "**chocolate brown**." Which of the following is the most appropriate treatment?
A. Methylene blue
B. Hydroxyurea
C. Daily penicillin
D. Folic acid
Answer: A. Methylene blue

7/ / A 2 year old child of Mediterranean descent is diagnosed with **β-thalassemia major *(Cooley anemia)***. Which finding is most characteristic of this condition on hemoglobin electrophoresis?
A. Presence of β_4 tetramers (HbH)
B. Hemoglobin S comprising 80-95% of total hemoglobin
C. Markedly elevated levels of HbF and HbA_2
D. Hemoglobin A comprising ~60% of total hemoglobin
Answer: C. Markedly elevated levels of HbF and HbA_2

8/ A 5 year old child with known **sickle cell disease** develops a high fever and is diagnosed with **sepsis** from an encapsulated bacterium. This increased susceptibility to infection is primarily due to which disease related complication?
A. Chronic hemolytic anemia
B. Vaso-occlusive crises in the long bones
C. Functional asplenia
D. Iron overload from transfusions
Answer: C. Functional asplenia

9/ An infant in the neonatal intensive care unit develops **cyanosis after exposure to an oxidizing agent**. **Infants** are particularly susceptible to the development of **methemoglobinemia** due to a relative physiological deficiency of which enzyme?
A. HMG-CoA reductase
B. Glucose-6-phosphate dehydrogenase
C. NADH-cytochrome b_5 reductase
D. Superoxide dismutase
Answer: C. NADH-cytochrome b_5 reductase

10/ A patient's electrophoresis shows **HbA_2 > 3.5%**. Which of the following is most likely ?
A. Iron deficiency anemia
B. β-thalassemia minor
C. α-thalassemia trait
D. Chronic lead poisoning
Answer: B. β-thalassemia minor

L1. Hemoglobinopathies

1/ Which of the following best defines hemoglobinopathies?
A. Acquired disorders of hemoglobin synthesis
B. Genetic disorders caused by abnormal or insufficient hemoglobin production
C. Infectious diseases affecting hemoglobin
D. Autoimmune hemolytic diseases
Answer: B. Genetic disorders caused by abnormal or insufficient hemoglobin production

2/ Sickle cell anemia is caused b?
A. Deletion of α-globin gene
B. Point mutation in β-globin gene
C. Frame shift mutation in α-globin gene
D. Duplication of β-globin gene
Answer: B. Point mutation in β-globin gene

3/In sickle cell anemia, which amino acid substitution occurs?
A. Glutamate → Lysine
B. Valine → Glutamate
C. Glutamate → Valine
D. Alanine → Valine
Answer: C. Glutamate → Valine

4/ Which hemoglobin moves fastest toward the anode during electrophoresis?
A. HbS
B. HbC
C. HbA
D. HbF
Answer: C. HbA

5/ Which type of hemoglobinopathy is sickle cell anemia?
A. Quantitative
B. Qualitative
C. Mixed
D. Secondary
Answer: B. Qualitative

6/ Which finding indicates splenic dysfunction in sickle cell disease?
A. Target cells
B. Howell–Jolly bodies
C. Heinz bodies
D. Bite cells
Answer: B. Howell–Jolly bodies

7/ A 7-year-old child with sickle cell anemia presents with fever and bone pain. Which of the following is most appropriate for prophylaxis?
A. Daily folic acid only
B. Daily penicillin and vaccination
C. Corticosteroids
D. Iron supplementation
Answer: B. Daily penicillin and vaccination

8/ Which enzyme deficiency can cause congenital methemoglobinemia?
A. Glucose-6-phosphate dehydrogenase
B. NADH-cytochrome b5 reductase
C. Pyruvate kinase
D. Catalase
Answer: B. NADH-cytochrome b5 reductase

9/ Hemoglobin C disease results from substitution of ?
A. Glutamate → Valine
B. Glutamate → Lysine
C. Valine → Glutamate
D. Valine → Lysine
Answer: B. Glutamate → Lysine

10/ A 10-year-old boy with chronic anemia and bone deformities is diagnosed with β-thalassemia major. What is the cause of his anemia?
A. Defective α-globin synthesis
B. Precipitation of excess α chains causing ineffective erythropoiesis
C. Iron deficiency
D. Folate deficiency
Answer: B. Precipitation of excess α chains causing ineffective erythropoiesis

11/ Which of the following differentiates β-thalassemia from α-thalassemia on electrophoresis?
A. Elevated HbA_2 levels
B. Decreased HbA_2
C. Increased HbC
D. Presence of Hb Bart's
Answer: A. Elevated HbA_2 levels

12/ Which laboratory feature supports thalassemia rather than iron deficiency anemia?
A. Low ferritin
B. High RDW
C. Normal ferritin with microcytosis
Answer: C. Normal ferritin with microcytosis

13/ A patient with HbSC disease shows moderate anemia and occasional painful crises. This occurs because ?
A. Both β genes are normal
B. Both β genes have the same mutation
C. Each β gene has a different mutation (compound heterozygosity)
D. There is α-globin deletion
Answer: C. Each β gene has a different mutation (compound heterozygosity)

14/A 6-year-old presents with mild anemia and Hb electrophoresis showing HbA_2 > 3.5%. What is the likely diagnosis?
A. Iron deficiency anemia
B. β-thalassemia minor
C. α-thalassemi
Answer: B. β-thalassemia minor

15/ In α-thalassemia with three gene deletions, the hemoglobin formed is:
A. Hb Bart's (γ_4)
B. HbH (β_4)
C. HbA_2
D. HbS
Answer: B. HbH (β_4)

16/ A 2-year-old child has severe anemia, hepatosplenomegaly, and requires frequent transfusions. Diagnosis shows β-thalassemia major. What is the curative treatment?
A. Hydroxyurea
B. Bone marrow transplant
C. Iron therapy
D. Splenectomy
Answer: B. Bone marrow transplant

17/ In β-thalassemia major, symptoms appear after birth because:
A. β-globin gene is active prenatally
B. HbF suppresses β-globin synthesis
C. β-globin gene is expressed late in fetal life
D. α-globin chains are overproduced prenatally
Answer: C. β-globin gene is expressed late in fetal life

18/ Treatment for methemoglobinemia is ?
A. Hydroxyurea
B. Iron
C. Methylene blue
Answer: C. Methylene blue

L1. Hemoglobinopathies past questions

1/ 12 year old with frequent headache, no organomegaly and **bony pain**. Blood smear shows **Howell-Jolly Bodies.** What's the most likely diagnosis ?
A. β-thalassemia
B. Methemoglobinemia
C. Sickle cell disease
D. Hemoglobin SC disease

2/ A baby with skin discoloration presents to the doctor. Diagnosis of **methemoglobinemia** is made. Deficiency of which enzyme may be the cause ?
A. Lysine substitution for glutamine
B. NADH-cytochrome B5 reductase
C. β-globin synthesis
D. Valine substitution for glutamate

3/ A genetic report of a 5 year-old African American boy was received. The child inherited HbS gene from one parent and a normal gene of beta-globin from the other parent. His hemoglobin electrophoresis showed HbS in less than 40% of total hemoglobin.
Which of the following represents his condition ?
A. HbSC disease (HbSC)
B. Carrier (Sickle trait)
C. Sickle β-thalassaemia
D. Sickle cell anemia (HbSS)

4/ A patient is diagnosed with Hemoglobin H (B4). What is the underlying genetic cause ?
A. Loss of all 4 alleles
B. Loss of 2 alleles
C. Loss of 3 alleles
D. Mutation in the beta-globin gene

5/ What is the effect of hydroxyurea in HbS ?
A. Decrease HbF
B. Increase HbF
C. Increase HbS
D. Decrease red blood cell production

6/ In sickle cell anemia, what is the primary mechanism of pathogenesis ?
A. Reactive oxygen species
B. HbS polymerization
C. Lysine substitution
D. Entire gene deletion

7/ A 3-year-old girl presents with hemolytic anemia and dehydration. Electrophoresis reveals she has HbC disease. This is caused by a mutation that replaces glutamic acid with which amino acid?
A.Valine
B. Arginine
C. Lysine
D. Glutamine

8/ Which of the following explains the presence of Howell-Jolly bodies in a blood smear ?
A. Thalassemia
B. Splenic dysfunction
C. Nitrates
D. Hemolytic anemia

9/ A 4 year-old boy was admitted to the hospital with **sepsis.** Investigations revealed that he was an undiagnosed case of sickle cell disease. Which of the following is an underlying mechanism that may precipitate sepsis in this case ?
A. Hyposplenism
B. Chronic hemolysis
C. Chronic anemia
D. Splenomegaly

10/ A 3 month-old newborn presents with pallor, jaundice, and hepatosplenomegaly. The hemoglobin level is 9 g/dL, and the blood smear shows **reticulocytosis** and **inclusion bodies**. What is the most likely diagnosis ?
A. Sickle cell anemia
B. Beta thalassemia
C. Alpha thalassemia
D. G6PD deficiency

11/ Hydroxyurea function by elevating levels which of the following ?
A. HbS
B. HbA
C. HbF
D. HbA2

L2. Dyslipidemia

1/ A 45 year-old patient with poorly controlled type 2 diabetes mellitus is found to have a **triglyceride level of 800 mg/dL**. What is the most likely biochemical mechanism predisposing him to this condition?
A. Decreased activity of HMG-CoA reductase
B. Upregulation of LDL receptor expression
C. Increased activity of hormone-sensitive lipase
D. Defective microsomal triglyceride transfer protein (MTTP)
Answer: C. Increased activity of hormone-sensitive lipase

2/ / A 14 year-old boy presents with **painful swellings on his Achilles tendons** and **knuckles**. His father had a heart attack at age 35. A lipid panel reveals a **total cholesterol of 650 mg/dL**, and a trial of high-dose statins shows minimal improvement. What is the most likely underlying mechanism for his condition?
A. Deficiency of lipoprotein lipase (LPL)
B. Absence of functional LDL receptors
C. An E2/E2 apolipoprotein genotype
D. A mutation in the microsomal triglyceride transfer protein (MTTP) gene
Answer: B. Absence of functional LDL receptors

3/ / A 9 month-old infant is evaluated for **failure to thrive and oily, foul-smelling stools**. Lab work is remarkable for a **total cholesterol of 45 mg/dL**. A peripheral blood smear is ordered. Which of the following findings is most anticipated?
A. Howell-Jolly bodies
B. Acanthocytes (spur cells)
C. Schistocytes
D. Hypersegmented neutrophilsv
Answer: B. Acanthocytes (spur cells)

4/ A 50 year-old woman with a serum **cholesterol of 280 mg/dL** is diagnosed with **heterozygous familial hypercholesterolemia**. She is started on a **statin**. How does this medication primarily work to lower her cholesterol?
A. By blocking the intestinal absorption of dietary cholesterol
B. By inhibiting HMG-CoA reductase and upregulating LDL receptors
C. By activating lipoprotein lipase to increase triglyceride breakdown
D. By increasing the excretion of bile acids from the gut
Answer: B. By inhibiting HMG-CoA reductase and upregulating LDL receptors

5/ **Severe hypertriglyceridemia** is commonly due to deficiency of ?
A. Apo B-100
B. Apo E
C. Lipoprotein lipase (LPL) or Apo C-II
D. Cholesteryl ester transfer protein
Answer: C. Lipoprotein lipase (LPL) or Apo C-II

6/ **Familial combined hyperlipoproteinemia** is due to excessive hepatic synthesis of ?
A. Apo A-I
B. Apo C-II
C. Apo B
D. Apo E
Answer: C. Apo B

7/ Which of the following apoprotein defects causes **accumulation of cholesterol-rich VLDL and chylomicron remnants** ?
A. Apo C-II
B. Apo B-100
C. Apo E2/E2 (defective remnant receptor binding)
D. Apo A-I
Answer: C. Apo E2/E2 (defective remnant receptor binding)

8/ A 6 month-old child presents with **steatorrhea**, **growth failure,** and **acanthocytosis**. Laboratory tests show **extremely low cholesterol** and **absence of VLDL and LDL**. What is the most likely diagnosis ?
A. Tangier disease
B. Abetalipoproteinemia (MTTP mutation)
C. Type I hyperlipoproteinemia
D. Hypoalphalipoproteinemia
Answer: B. Abetalipoproteinemia (MTTP mutation)

9/ 35 year-old woman with poorly controlled diabetes presents with severe abdominal pain. **Serum TG = 1400 mg/dL**. Which serious complication is she at greatest risk for ?
A. Stroke
B. Acute pancreatitis
C. Myocardial infarction
D. Fatty liver
Answer: B. Acute pancreatitis

10/ A patient with **chronic liver cholestasis** has **elevated total cholesterol but normal LDL receptor function**. Which abnormal lipoprotein causes this elevation?
A. Apo E
B. Lipoprotein-X (Lp-X)
C. Apo C-II
D. VLDL remnants
Answer: B. Lipoprotein-X (Lp-X)

L2. Dyslipidemia

1/ Dyslipidemia is defined as ?
A. Increased liver enzymes
B. Abnormal serum lipid levels
C. Decreased serum protein
D. Elevated blood glucose
Answer: B. Abnormal serum lipid levels

2/ Which drug can cause dyslipidemia?
A. ACE inhibitors
B. Beta blockers
C. Metformin
D. Statins
Answer: B. Beta blockers

3/ Hyperlipoproteinemias include ?
A. Hypocholesterolemia
B. Hypercholesterolemia, hypertriglyceridemia, and combined hyperlipidemia
C. Hyperbilirubinemia
D. Hyperglycemia
Answer: B. Hypercholesterolemia, hypertriglyceridemia, and combined hyperlipidemia

4/ Familial hypercholesterolemia (FH) is due to a defect in ?
A. HMG-CoA reductase
B. LDL receptors
C. HDL transport
D. VLDL synthesis
Answer: B. LDL receptors

5/ In FH, homozygotes typically have serum cholesterol levels ?
A. 100–200 mg/dL
B. 200–300 mg/dL
C. ≥ 500 mg/dL
D. < 100 mg/dL
Answer: C. ≥ 500 mg/dL

6/ The primary lipoprotein elevated in FH is ?
A. HDL
B. VLDL
C. LDL
D. Chylomicrons
Answer: C. LDL

7/ Statins lower LDL by?
A. Increasing cholesterol absorption
B. Blocking LPL
C. Inhibiting HMG-CoA reductase and upregulating LDL receptors
D. Inhibiting apo E synthesis
Answer: C. Inhibiting HMG-CoA reductase and upregulating LDL receptors

8/ Patients with FH homozygous form are treated with?
A. Dietary fiber
B. LDL pheresis
C. Niacin
D. Insulin
Answer: B. LDL pheresis

9/ The enzyme responsible for hydrolyzing triglycerides in chylomicrons and VLDL is?
A. HMG-CoA reductase
B. Hormone-sensitive lipase
C. Lipoprotein lipase (LPL)
D. Lecithin cholesterol acyltransferase
Answer: C. Lipoprotein lipase (LPL)

10/ A 4-year-old with recurrent pancreatitis and fasting hypertriglyceridemia likely has deficiency of?
A. Apo B-100
B. Apo C-II
C. Apo E
D. CETP
Answer: B. Apo C-II

11/ Familial combined hyperlipoproteinemia (FCH) results from?
A. LDL receptor defect
B. Excessive hepatic apo B synthesis
C. Apo E deficiency
D. CETP overactivity
Answer: B. Excessive hepatic apo B synthesis

12/ A 35-year-old patient with palmar xanthomas and premature CHD likely has?
A. Familial combined hyperlipoproteinemia
B. Familial dysbetalipoproteinemia
C. Hypertriglyceridemia
D. Abetalipoproteinemia
Answer: B. Familial dysbetalipoproteinemia

13/ The defect in familial dysbetalipoproteinemia (Type III) involves?
A. Apo C-II
B. Apo E2 variant that cannot bind hepatic receptors
C. Apo B-48
D. HMG-CoA reductase
Answer: B. Apo E2 variant that cannot bind hepatic receptors

14/ Which combination drug therapy may be used in combined hyperlipidemia?
A. Niacin + fibrates + statins
B. Insulin + statins
C. Iron + vitamins
D. Diuretics + corticosteroids
Answer: A. Niacin + fibrates + statins

15/ Abetalipoproteinemia is caused by mutation in?
A. Apo C-II gene
B. Microsomal triglyceride transfer protein (MTTP) gene
C. HMG-CoA reductase gene
D. LDL receptor gene
Answer: B. Microsomal triglyceride transfer protein (MTTP) gene

16/ In abetalipoproteinemia, which lipoproteins are deficient?
A. Chylomicrons, VLDL, and LDL
B. HDL only
C. VLDL only
D. IDL and HDL
Answer: A. Chylomicrons, VLDL, and LDL

17/ A child with steatorrhea, fat-soluble vitamin deficiency, and acanthocytosis likely has?
A. Hypoalphalipoproteinemia
B. Abetalipoproteinemia
C. Hypertriglyceridemia
D. Dysbetalipoproteinemia
Answer: B. Abetalipoproteinemia

18/ A 17-year-old with cholesterol > 500 mg/dL and xanthomas on tendons most likely has?
A. Heterozygous FH
B. Homozygous FH
C. FCH
D. Type III dyslipidemia
Answer: B. Homozygous FH

L2. Dyslipidemia past questions

1/ A patient with increased triglycerides and cholesterol. Which apoprotein is deficient ?
A. Apo C-II
B. Apo B-48
C. Apo E
D. Apo B-100

2/ A patient presents with hyperlipidemia, total cholesterol 350 mg/dL, and TAGs 200 mg/dL. Which type of dyslipidemia is most likely ?
A. Familial Hypercholesterolemia
B. Combined Hyperlipoproteinemia
C. Hypolipoproteinemia
D. Hypertriglyceridemia

3/ Familial dysbetalipoproteinemia is due to a defect in which of the following ?
A. Apo B-48
B. Apo C-II
C. ApoA1
D. Apo E

4/ A 19 year-old male patient presents with tuberoeruptive exanthemata and **palmar xanthoma**. His lab investigations show **high serum triglyceride** and **total cholesterol levels**. DNA typing reveals a gene abnormality of **apo E2/E2**. What types of lipoproteins will accumulate in the blood of this case ?
A. Chylomicron remnants and High Density Lipoprotein
B. Cholesterol-rich VLDL and Chylomicron remnants
C. Chylomicron remnants and Low Density Lipoprotein
D. Cholesterol-rich VLDL and High Density Lipoprotein

5/ Why does diabetes mellitus predispose to hypertriglyceridemia ?
A. Because of activation of lipoprotein lipase enzyme due to deficiency of insulin
B. Because glucose is shunted to the pentose phosphate pathway leading to increased synthesis of fatty acids
C. Because of inhibition of hormone sensitive lipase enzyme leading to less destruction of triglycerides

6/ A 35 year-old man with heterozygous familial hypercholesterolemia is started on a statin. How do statins lower LDL in this patient ?
A. Increase HMG-CoA reductase activity
B. Increase LDL receptor expression
C. Decrease LDL receptor expression
D. Decrease bile acid excretion

7/ A patient's lipid profile shows **elevated total cholesterol**, elevated LDL, slightly VLDL, but **normal triglyceride (TAG)** levels. Which of the following is the most likely diagnosis?
A. Hypertriglyceridemia *(↑ Chol + ↑ TG)*
B. Combined Hyperlipidemia *(↑ TG only)*
C. Hypolipoproteinemia *(↓ Lipoproteins)*
D. Hypercholesterolemia *(↑ Chol only)*

8/ A patient presents with severely elevated triglycerides (TAG > 1000 mg/dL). Which of the following is the most likely defect ?
A. Apo E
B. Apo C-II
C. Apo B-48
D. Apo B-100

9/ Which of the following describes the mechanism of action of gemfibrozil ?
A. Increase the excretion of bile acids
B. Increased triglyceride hydrolysis by lipoprotein lipase
C. Reduce reuptake of dietary cholesterol
D. Increase expression of LDL-C receptors

L3. Cardiac markers

1/ What type of junction connects cardiac myocytes to allow rapid electrical
conduction?
A. Tight junctions
B. Gap junctions
C. Desmosomes
D. Adherens junctions
Answer: B. Gap junctions

2/ Which enzyme converts pyruvate to acetyl-CoA?
A. Lactate dehydrogenase
B. Pyruvate dehydrogenase
C. Pyruvate carboxylase
D. Glucose-6-phosphatase
Answer: B. Pyruvate dehydrogenase

3/ Which glucose transporter is primarily responsible for glucose uptake in the heart?
A. GLUT-2
B. GLUT-3
C. GLUT-4
D. GLUT-5
Answer: C. GLUT-4

4/ During fatty acid metabolism, long-chain fatty acids enter the mitochondria via:
A. Simple diffusion
B. Carnitine shuttle
C. Sodium pump
D. GLUT transporter
Answer: B. Carnitine shuttle

5/ Which coenzymes are generated during β-oxidation?
A. NADH and $FADH_2$
B. NADPH and ATP
C. GTP and $FADH_2$
D. NADPH and GDP
Answer: A. NADH and $FADH_2$

6/ Increased fatty acid oxidation inhibits glucose oxidation by:
A. Increasing mitochondrial NADH and acetyl-CoA
B. Decreasing PDH activity
C. Both A and B
D. None of the above
Answer: C. Both A and B

7/ During starvation, which substrates become a major energy source for the heart?
A. Amino acids
B. Ketone bodies
C. Glucose
D. Lactate
Answer: B. Ketone bodies

8/ Ketone bodies inhibit:
A. β-oxidation
B. Glycolysis
C. Pyruvate dehydrogenase
D. Lipolysis
Answer: C. Pyruvate dehydrogenase

9/ During ischemia, which compound supplies short-term energy to regenerate ATP?
A. Glycogen
B. Creatine phosphate
C. Lactic acid
D. Fatty acids
Answer: B. Creatine phosphate

10/ Which enzyme catalyzes ADP phosphorylation using creatine phosphate?
A. ATP synthase
B. Creatine kinase
C. Lactate dehydrogenase
D. Hexokinase
Answer: B. Creatine kinase

11/ Acute coronary syndrome includes all EXCEPT:
A. STEMI
B. NSTEMI
C. Stable angina
D. Unstable angina
Answer: C. Stable angina

12/ Cardiac biomarkers are released into circulation due to:
A. Cardiac muscle necrosis
B. Increased heart rate
C. Arrhythmia
D. Atrial fibrillation
Answer: A. Cardiac muscle necrosis

13/ The rate of biomarker release depends on:
A. Intracellular location and molecular weight
B. Blood pH only
C. Blood sugar levels
D. Patient's age
Answer: A. Intracellular location and molecular weight

14/ Cardiac-specific isoforms of troponin are:
A. cTnA and cTnB
B. cTnI and cTnT
C. cTnC and cTnM
D. cTnL and cTnN
Answer: B. cTnI and cTnT

15/ cTnI is superior in specificity because:
A. It is found in skeletal muscle
B. It is not expressed in skeletal muscle
C. It is more stable
D. It rises later than cTnT
Answer: B. It is not expressed in skeletal muscle

L3. Cardiac markers

16/ Troponins remain elevated after MI for up to:
A. 1 day
B. 3 days
C. 10 days
D. 14 days
Answer: C. 10 days

17/ Elevated troponins without MI may be seen in:
A. Renal failure
B. Migraine
C. Pneumonia
D. Hypertension alone
Answer: A. Renal failure

18/ Which of the following is a cardiovascular cause of elevated troponins?
A. Cardiac surgery
B. Asthma
C. Hepatitis
D. Gastroenteritis
Answer: A. Cardiac surgery

19/ Which CK isoenzyme is most specific for cardiac tissue?
A. CK-MM
B. CK-BB
C. CK-MB
D. CK-LL
Answer: C. CK-MB

20/ Which enzyme is no longer used for cardiac diagnosis?
A. CK-MB
B. LDH
C. Troponin
D. Myoglobin
Answer: B. LDH

21/ A patient presents 2 hours after chest pain onset. Which biomarker is most useful at this stage?
A. Troponin
B. Myoglobin
C. CK-MB
D. LDH
Answer: B. Myoglobin

22/ Myoglobin appears in the blood within how many hours after MI?
A. 1–3 hours
B. 4–6 hours
C. 10 hours
D. 24 hours
Answer: A. 1–3 hours

23/ A 58-year-old with crushing chest pain has elevated cTnI and CK-MB. ECG shows ST
elevation. Diagnosis?
A. Stable angina
B. NSTEMI
C. STEMI
D. Myocarditis
Answer: C. STEMI

24/ A 67-year-old with renal failure has elevated troponins but normal ECG. The likely cause is:
A. Acute MI
B. Noncardiac troponin elevation due to renal dysfunction
C. Pulmonary embolism
D. Heart block
Answer: B. Noncardiac troponin elevation due to renal dysfunction

25/ A marathon runner with muscle soreness has elevated CK-MB. Best next test?
A. LDH
B. Troponin
C. Myoglobin
D. AST
Answer: B. Troponin

26/ Which marker returns to normal first after MI?
A. CK-MB
B. Troponin
C. LDH
D. AST
Answer: A. CK-MB

27/ Which of the following laboratory findings may also increase during acute MI but is
non-specific?
A. ESR
B. Calcium
C. Potassium
D. Albumin
Answer: A. ESR

28/ BNP or NT-proBNP levels are elevated in:
A. Myocarditis
B. Heart failure
C. Renal calculi
D. Pulmonary fibrosis
Answer: B. Heart failure

29/ Which protein increases rapidly after ischemia but lacks specificity?
A. Myoglobin
B. CK-MB
C. LDH
D. Troponin
Answer: A. Myoglobin

30/ During ischemia, accumulation of lactate leads to:
A. Activation of glycolysis
B. Inhibition of glycolysis
C. Enhanced PDH activity
D. Increased contractility
Answer: B. Inhibition of glycolysis

L3. Cardiac markers past questions

1/ What's the main source of energy for the heart in the postabsorptive state ?
A. Glucose
B. FFA
C. Ketone bodies
D. Amino acids

2/ Patient has a myocardial infarction. Cardiac marker levels are measured. 3 days later the patient is discharged and all cardiac markers are normal except troponin which is still elevated. 2 days later the patient has acute chest pain. Which test can be used to determine ?
A. Troponin I
B. Myoglobin
C. CK-MB
D. Lactate Dehydrogenase

3/ Accumulation of lactate inhibits ?
A. Glucose Transport
B. Fatty Acid Oxidation
C. Glycolysis
D. Glycogenolysis

4/ Myoglobin is elevated as early as ?
A. 1-3 hours after MI
B. 4-9 hours after MI
C. 6-8 hours after M
D. 12-24 hours after MI

5/ Following an acute myocardial infarction, which cardiac biomarker remains elevated the longest, helping in late diagnosis up to 7–10 days after the event ?
A. Myoglobin
B. CK-MB
C. Troponin I/T
D. AST

Epidemiology



L1. Epidemiology of Tobacco use and ARI

1/ A 2-year-old boy from a rural area presents with cough, difficulty breathing, and fever. His weight is below average for his age, and the **family lives in a small, poorly ventilated house that uses firewood for cooking.** Which factor most likely contributes to the severity of his ARI?
A. Routine immunization
B. Indoor air pollution from firewood smoke
C. High vitamin A intake
Answer: B. Indoor air pollution from firewood smoke

2/ A 3-year-old **malnourished** boy presents with recurrent episodes of cough and pneumonia. His **diet lacks fruits and vegetables**. Which nutritional deficiency increases his risk of ARI by damaging the respiratory epithelium?
A. Vitamin D deficiency
B. Vitamin B12 deficiency
C. Vitamin A deficiency
D. Vitamin C deficiency
Answer: C. Vitamin A deficiency

3/A 5-year-old child living in an **industrial area** frequently suffers from cough and sore throat, **especially in winter**.Which environmental factors are most likely responsible for this recurrent ARI?
A. Poor nutrition and lack of immunization
B. Air pollution and cold-season overcrowding
C. Lack of sanitation and poor ventilation
Answer: B. Air pollution and cold-season overcrowding

4/ A **1-year-old unvaccinated boy** presents with severe cough and fever. His medical history reveals **no immunization against diphtheria, measles, or pertussis**.What is the most probable reason for his increased risk of ARI?
A. Lack of primary immunization
B. Malnutrition
C. Exposure to passive smoking
D. Vitamin A deficiency
Answer: A. Lack of primary immunization

5/ A 9-month-old infant comes for a routine immunization visit. The healthcare worker provides an **oral supplement to prevent severe ARIs** and **strengthen mucosal defense.**
Which specific preventive measure is being applied?
A. Oral vitamin A supplementation (5 mega doses from 9 months to 3 years)
B. Reduction of parental smoking indoors
C. Exclusive breastfeeding for 6 months
D. Routine immunization
Answer: A. Oral vitamin A supplementation

6/ A 3-month-old male infant presents with **fast breathing and chest indrawing.** He was born at home with **low birth weight** and was not exclusively breastfed. Which of the following is a host risk factor present in this infant?
A.Urban living
B. Winter season
C. Parental smoking
D. Low birth weight
Answer: D. Low birth weight

7/A full-term **newborn** develops **respiratory distress within 24 hours of birth.** Blood cultures show E. coli growth. Which is a possible mode of transmission for this infection?
A. Transplacental from mother
B. Ingestion of contaminated breast milk
C. Contact with unsterile hospital equipment
Answer: A. Transplacental from mother

8/ A local community experiences a **sudden rise in measles cases.** What type of ARI outbreak is this?
A. Epidemic
B. Endemic
C. Pandemic
D. Sporadic
Answer: A. Epidemic

L1. Epidemiology of Tobacco use and ARI past questions

1/ Which of the following is the delayed effect of smoking during pregnancy ?
A. Improved brain development
B. Improved lung function
C. Low birth weight
D. Enhanced immune system development

2/ Which acute respiratory disease causes the highest mortality in **infants ?**
A. Bronchiolitis
B. Measles
C. Influenza
D. Common cold

3/ Which of the following is considered a specific protective measure against acute respiratory infections (ARI) in children?
A. Iron supplementation
B. Oral vitamin A concentrate
C. Exclusive breastfeeding up to 6 months
D. Adequate housing and sanitation

4/ Acute respiratory infections (ARI) most commonly peak in which age group ?
A. Adolescence
B. Infants
C. 5-15 years
D. Old age

5/ What is the approximate rate of acute respiratory infections (ARI) in developing countries ?
A. 100 times more
B. 10 times more
C. 50 times more
D.25 times less

L2. Epidemiology of TB

1/ A health officer reports that **5 new TB cases** were detected this year **per 1000 people** in a village. What does this number represent?
A. Prevalence of infection
B. Incidence of disease
C.Annual infection rate
Answer: B. Incidence of disease

2/ In a slum area, TB incidence is found to be high among **undernourished** children living in **overcrowded** conditions.Which of the following is the most important predisposing factor in this setting?
A. Heredity
B. Genetic inheritance
C. Socio-environmental conditions such as poverty and malnutrition
Answer: C. Socio-environmental conditions such as poverty and malnutrition

3/A 45-year-old man is diagnosed with pulmonary TB. Records show that 3% of all TB patients in the region are **resistant to isoniazid and rifampicin.**Which indicator does this percentage represent?
A. TB-specific mortality
B. Prevalence of drug-resistant cases
C. Incidence of infection
Answer: B. Prevalence of drug-resistant cases

4/ A **15-year-old girl** is found to have a positive tuberculin test. Epidemiologically, this represents which "peak" of TB occurrence?
A. Large peak during adolescence
B. Small peak during early childhood
C. Moderate peak during elderly
Answer: A. Large peak during adolescence

5/ A farmer regularly **drinks unpasteurized milk** and develops intestinal tuberculosis. What is the most likely route of transmission?
A. Inhalation of infected dust *(another mode of transmission)*
B. Ingestion of milk contaminated with the bovine strain of M. bovis
C.Contact with contaminated soil
Answer: B. Ingestion of milk contaminated with the bovine strain of M. bovis

6/ In **developed countries**, tuberculosis is most commonly seen in:
A. The elderly
B.Adolescents
C. Children under 5
Answer: A. The elderly

7/ A 7-year-old child has no TB exposure and is healthy. Which age group is considered the **"golden age"** of resistance to tuberculosis?
A. Adolescents
B. 5–15 years
C. Infants
Answer: B. 5–15 years

8/In a community survey, doctors find that tuberculosis **occurs more often in men**, but more **women die from the disease**.Which of the following statements best explains this finding?
A. TB is more common in men, but the mortality rate is higher in women.
B. Women are more likely to get infected than men
C. Men have higher mortality than women
Answer: A. TB is more common in men, but the mortality rate is higher in women.

9/ If a country introduces an effective treatment program and the number of TB deaths per year declines, which rate is affected?
A.Drug-resistance rate
B.Incidence of infection
C.specific mortality rate
Answer: C.specific mortality rate

10/ A TB control officer describes the "attacking force" of tuberculosis in a community. Which epidemiologic measure is she referring to?
A. Annual infection rate
B. TB-specific mortality
C. Case rate
Answer: A. Annual infection rate

L2. Epidemiology of TB past questions

1/ Why is the age group 5-15 considered a golden age in tuberculosis (TB)?
A. Fewer incidents of TB
B. Fewer complications of TB
C. More combination of TB treatments
D. Stronger immune response to TB

2/ Given that the mortality rate of all diseases is 47/1000 MYP, and the mortality rate of diseases other than TB is 31/1000 MYP, what is the specific mortality rate of tuberculosis (TB)?
A. 14/1000 MYP
B. 16/1000 MYP
C. 12/1000 MYP
D. 18/1000 MYP

3/ Why is tuberculosis (TB) considered a social disease?
A. High mortality rate
B. Prevalence of many social factors
C. Limited access to treatments
D. Genetic predisposition

4/ In developing countries, the age group between 5-15 years is characterized by the ___ incidence of tuberculosis (TB) ?
A. Highest
B. Moderate
C. Least
D. Extensive

5/ The total number of cases of a disease refers to ?
A. Incidence of the disease
B. Prevalence of disease
C. Prevalence of drug resistant cases
D. TB specific mortality rate

6/ At what age does the peak incidence of tuberculosis (TB) typically occur ?
A. Adolescence
B. Age group between (5-15)
C. Childhood
D. Infants

7/ A man presents with symptoms of abdominal pain and weight loss. After further examination, it is revealed that he has TB of the intestine. He reports drinking raw, unpasteurized milk from his family's cattle farm. What is the most likely cause of his condition?
A. Airborne transmission from a sick family member
B. Ingestion of raw unpasteurized milk from infected cattle
C. Direct contact with infected livestock feces
D. Consumption of undercooked meat from infected cattle

8/ A region has a population of 200,000. Total TB cases = 300. What is the Prevalence per 100,000 ?
A. 100 / 100,000
B. 120 / 100,000
C. 140 / 100,000
D. 150 / 100,000

$$\text{Prevalence} = \frac{\text{(Total cases } [old + new]\text{)}}{\text{(Total population)} \times \text{Multiplier}}$$

9/ Given that a population of 1,000 children were tested with tuberculin, and 150 showed a positive reaction, what is the Tuberculin Index ?
A. 10%
B. 12%
C. 15%
D. 20%

$$\text{Tuberculin Index (\%)} = \frac{\text{(Number of positive tuberculin tests)}}{\text{(Total tested population)} \times 100}$$

10/ Given that new TB cases are 20, old cases are 230, the mid-year population is 25,000, age group 15–45 years, and an adjustment factor of 16,000, what is the prevalence of tuberculosis in this population ?
A. 1/100
B. 25/250
C. 250/25000
D. 1/16,000

$$\text{Prevalence} = \frac{\text{Total cases: } (230 + 20 = 250)}{\text{MYP: } 25000} = 0.01 = \frac{1}{100}$$

L3. TB re-emerging Disease

1/ Which of the following best defines a **re-emerging infectious disease** ?
A. Newly discovered infectious agent
B. Previously controlled disease showing increased incidence again
C. Disease caused by a new mutation of virus
D. Infectious disease found only in animals
Answer: B. Previously controlled disease showing increased incidence again

2/ What is considered the **main basic *(general)* preventive measure against tuberculosis** ?
A. BCG vaccination
B. Chemoprophylaxis with INH
C. Socioeconomic development
D. Isolation of TB patients
Answer: C. Socioeconomic development

3/ What is the main factor responsible for the **re-emergence of tuberculosis globally** ?
A. Increased use of antibiotics
B. Poor ventilation and housing
C. Malnutrition
D. HIV/AIDS epidemic
Answer: D. HIV/AIDS epidemic

4/ Which of the following is an example of a **re-emerging infectious disease** ?
A. HIV
B. Tuberculosis
C. Rotavirus
D. Ebola
Answer: B. Tuberculosis

5/ **Chemoprophylaxis with isoniazid (INH)** is recommended for which of the following groups ?
A. All adults with negative tuberculin tests
B. Close contacts of active TB cases and young children below 5 years
C. Vaccinated individuals
D. Patients already under anti-TB therapy
Answer: B. Close contacts of active TB cases and young children below 5 years

6/ Which of the following best defines an **emerging infectious disease** ?
A. A previously known infection that has increased in incidence
B. A newly identified or previously unknown infectious agent causing new public health problems
C. A disease that only affects animals
D. A disease completely eradicated
Answer: B. A newly identified or previously unknown infectious agent causing new public health problems

7/ Which of the following are examples of emerging infectious diseases?
A. Corona (COVID-19)
B. HIV/AIDS
C. Influenza
D. Hepatitis C
Answer: All the above

8/ A 25 y.o **nurse working in a chest clinic tests negative on tuberculin screening**. She **will be exposed to TB patients daily**. What is the best preventive strategy ?
A. Only BCG vaccination
B. Only INH prophylaxis
C. BCG vaccination (INH-resistant strain) plus temporary INH chemoprophylaxis
D. Annual chest X-ray only
Answer: C. BCG vaccination (INH-resistant strain) plus temporary INH chemoprophylaxis

9/ Which of the following diseases shows a **downward trend** worldwide ?
A. Smallpox
B. Poliomyelitis
C. Measles
D. Leprosy
Answer: All the above

10/ Which of the following diseases shows an **upward trend** worldwide?
A. Smallpox
B. Tuberculosis
C. Poliomyelitis
D. Neonatal tetanus
Answer: B. Tuberculosis

L3. TB re-emerging Disease past questions

1/ Infectious agents that were once controlled but are now increasing in incidence or prevalence worldwide are called:
A. Re-emerging infectious diseases
B. Emerging infectious diseases
C. Endemic diseases
D. Hyperendemic diseases

2/ What was the primary cause of the re-emergence of tuberculosis (TB) in the 2000s?
A. Antibiotic resistance
B. Increased global travel
C. HIV/AIDS pandemic
D. Decline in vaccination rates

3/ During pre-employment examination, a 37-years-old chest physician, he was found to be tuberculin non-reactor. What are the best protective measures to be applied for him for being able to practice his job?
A. Chemo-prophylaxis before work start and while dealing with patients
B. Vaccination with BCG and allowing medical practice after two weeks of the vaccine
C. Vaccination with INH-resistant strain BCG vaccine and chemo-prophylaxis
D. Avoid vaccination and recommend work-long chemo-prophylaxis

4/ During a pre-employment examination, some employees were found to be TB reactors, while others were TB non-reactors. What is the appropriate management for the TB non-reactors?
A. BCG vaccination (vaccination for TB non reactors)
B. Chemoprophylaxis (vaccination for TB reactor)
C. Conducting a chest X-ray
D. Monitoring for symptoms of TB

5/ Which of the following is commonly given to high risk tuberculin reactors to prevent the development of tuberculosis (TB) ?
A. Rifampin
B. Ethambutol
C. Isoniazid
D. Pyrazinamide

6/ A male patient with diabetes mellitus is tested for tuberculosis and is found to be a strong TB reactor. What is the most appropriate management ?
A. BCG vaccine
B. INH prophylaxis
C. No treatment is required
D. INH & BCG vaccine

L4. Occupational Health program

1/ During a **periodic medical examination**, a 45-year-old painter is found to have slightly elevated blood lead levels compared to last year. What is the primary purpose of this type of examination?
A.To ensure continued fitness and detect early occupational effects
B. To diagnose infectious diseases
C. To provide medical treatment for existing illness
Answer: A.To ensure continued fitness and detect early occupational effects

2/ During inspection, an occupational health physician observes poor lighting, insufficient ventilation, and lack of washing facilities. Which element of the OHP is being violated?
A. Monitoring and evaluation
B. Health education
C. Sanitary environment (Health promotion)
Answer: C. Sanitary environment (Health promotion)

3/ A worker suffers from decreased productivity and frequent absenteeism due to malnutrition. Which OHP component directly addresses this problem?
A. Periodic examination
B. Socioeconomic and nutritional promotion
C. Rehabilitation
Answer: B. Socioeconomic and nutritional promotion

4/ A factory nurse conducts a talk about proper use of protective clothing and early signs of occupational lung disease. This activity represents:
A. Specific health education
B. Socioeconomic improvement
C. Health appraisal
Answer: A. Specific health education

5/ A worker develops partial hearing loss from long-term noise exposure and is later trained for a desk-based administrative role. This is an example of:
A. Health promotion
B. Rehabilitation
C. Screening test
Answer: B. Rehabilitation

6/ Which of the following activities is part of monitoring and evaluation of occupational health services?
A.Giving safety lectures
B. Reviewing service statistics and accident reports
C. Conducting pre-placement examinations
Answer: B. Reviewing service statistics and accident reports

7/ A physician working in a large chemical plant regularly reviews health records, inspects the workplace, and ensures vaccination against communicable diseases. These activities fall under which role?
A. Preventive role of the occupational health physician
B. Review Health Records
C. Curative role
Answer: A. Preventive role of the occupational health physician

8/ A worker collapses after exposure to toxic fumes, and the occupational physician provides first aid and arranges for hospital transfer. This action represents:
A. Preventive role
B. Curative and emergency role of the occupational health physician
C. Monitoring and evaluation
Answer: B. Curative and emergency role of the occupational health physician

9/ A worker showing signs of stress and low motivation would benefit most from which OHP measure?
A. Rehabilitation
B. Screening tests
C. Mental health promotion
Answer: C. Mental health promotion

10/ Periodic screening tests are performed to:
A. Detect pathological changes early due to occupational exposure
B. Identify workers' nutritional habits
C. Identify social problems
Answer: A. Detect pathological changes early due to occupational exposure

L4. Occupational Health program past questions

1/ What is the main objective of a pre-placement medical exam?
A. Early detection of diseases
B. Medico-legal value
C. Assessing fitness for work
D. Preventive health measures

2/ Which of the following can help in achievement of adequate nutrition for workers?
A. Wearing of protective clothes and devices
B. Avoid exposure to excess heat and humidity
C. Prevention and control of parasitic diseases
D. Regulation of ventilation of work place

3/ A patient becomes deaf due to an occupational injury. The company provides training for a new role based on the patient's capabilities. What is this process called?
A. Rehabilitation
B. Compensation
C. Vocational retraining
D. Adaptation

4/ A new employee inquires about the health care options available. The appropriate response is:
A. Treatment for both occupational and non-occupational diseases
B. Coverage for work-related injuries only
C. General medical insurance
D. Preventive health care services

L5. Public health aspects of pneumoconiosis

1/ Which of the following is considered a **preventive measure performed by the physician** for workers exposed to occupational dust?
A. Installation of local exhaust ventilation
B. Pre-employment and periodic medical examination
C. Use of synthetic grinding wheels instead of sandstone
Answer: B. Pre-employment and periodic medical examination

2/ **A middle-aged man with a 20-year history of working in the pottery (clay) industry** presents with **mild dyspnea on exertion and a non-productive cough.** Which of the following occupational lung diseases is most likely in this patient?
A. Anthracosis
B. Asbestosis
C. Silicosis
Answer: C. Silicosis

3/ After working **underground for many years**, a patient presents with a **productive purulent cough** at rest. Chest X-ray shows **"egg-shell"** calcification of the **hilar lymph nodes and nodular opacities** mainly in the **upper lung lobes.** Which of the following is the most likely diagnosis?
A. Anthracosis
B. Asbestosis
C. Silicosis
Answer: C. Silicosis

4/ A coal miner with a **long history** of **exposure to coal dust** presents with **progressive dyspnea** and **fibrotic changes** in his lungs. Which of the following complications is most commonly associated with this condition?
A. Cor pulmonale
B. Tuberculosis
C. Bronchial asthma
Answer: C. Tuberculosis

5/ During a **pre-employment medical examination** for a **cement factory**, a 25-year-old man is found to have a **history of chronic bronchitis** and **10 years** of previous **dust exposure.** According to the **preventive principles** of **occupational lung diseases**, which of the following is the most appropriate recommendation?
A. Allow employment with regular checkups
B. Start employment with protective mask only
C. Exclude from employment in dusty environment
Answer: C. Exclude from employment in dusty environment

6/ **Regular physical exercise decreases** the risk of **coronary artery disease** primarily by which of the following mechanisms?
A. Reducing LDL levels only
B. Elevating the level of HDL cholesterol
C. Decreasing myocardial oxygen demand
Answer: B. Elevating the level of HDL cholesterol

7/ A 55-year-old man has the following lipid profile:
- LDL cholesterol: 170 mg/dL
- HDL cholesterol: 30 mg/dL

The LDL/HDL ratio = 170 ÷ 30 = 5.6.
Why is this ratio considered significant in assessing the risk of coronary artery disease (CAD)?
A. Because it is equal to 4
B. Because it is more than 5
C. Because HDL is greater than LDL
Answer: B. Because it is more than 5

8/ A 55-year-old woman has been taking **oral contraceptive pills (OCPs)** for several years. According to the **modifiable risk factors** for ischemic heart disease (IHD), which of the following complications is she **most at risk of developing?**
A. Pulmonary embolism
B. Hypertrophic cardiomyopathy
C. Coronary artery disease
Answer: C. Coronary artery disease

9/ Which of the following is considered a **non-modifiable risk factor** for ischemic heart disease (IHD)?
A. Smoking
B. Hypertension
C. Family history
Answer: C. Family history

10/ A 22-year-old patient with a known **history of rheumatic heart disease** is about to be discharged from the hospital after treatment. Which of the following is the **most appropriate management** to prevent further rheumatic complications?
A. Short-term oral penicillin therapy for 10 days
B. Annual influenza vaccination
C. Long-life secondary prophylaxis with benzathine penicillin
Answer: C. Long-life secondary prophylaxis with benzathine penicillin

11/ A 55-year-old man who has worked in a **sugarcane processing plant for 25 years presents** with **fever, cough, and dyspnea**. Chest imaging shows diffuse interstitial (fibrotic) infiltrates consistent with an interstitial lung disease.
Which of the following occupational lung diseases is most likely responsible for this condition?
A. Silicosis
B. Byssinosis
C. Bagassosis
Answer: C. Bagassosis

12/ A 45-year-old businessman is found to have a **blood pressure of 142/95 mmHg** during a routine checkup. Which of the following **modifiable risk factors** is most likely responsible for **increased sympathetic nervous system activity contributing** to his **elevated blood pressure?**
A. High dietary sodium intake
B. Sedentary occupation and stress
C. Cigarette smoking
Answer: B. Sedentary occupation and stress

13/ A patient with **hypertension** develops a **stroke** resulting in **hemiplegia**.
A **rehabilitation program** is initiated to help him **regain physical function** and improve quality of life. This type of preventive measure is best described as?
A. Primary prevention
B. Secondary prevention
C. Tertiary prevention
Answer: C. Tertiary prevention

14/ A child is diagnosed with streptococcal throat infection confirmed by laboratory testing. Which of the following is the most appropriate **specific protective measure** to prevent the **first attack of acute rheumatic fever?**
A. Daily oral penicillin for 10 days
B. A single dose of benzathine penicillin
C. Long-term secondary prophylaxis
Answer: B. A single dose of benzathine penicillin

15/ A 60-year-old construction worker presents with **progressive dyspnea and dry cough**. He has a history of **long-term exposure to building demolition**. Chest X-ray shows **pleural thickening and plaques,** and the heart borders appear obscured **("shaggy heart" sign).** Physical examination reveals **clubbing of fingers.** Which of the following is the most likely diagnosis?
A. Silicosis
B. Anthracosis
C. Asbestosis
D. Byssinosis
Answer: C. Asbestosis

L5. Public health aspects of pneumoconiosis past questions

1/ A patient who has worked in a cotton factory for 25 years presents with dyspnea. What is the most probable cause?
A. Byssinosis
B. Pneumoconiosis
C. Asbestosis
D. Silicosis

2/ A patient diagnosed with silicosis is at risk for which of the following complications?
A. Asthma
B. Tuberculosis
C. Pneumothorax
D. Emphysema

3/ What is the most effective control measure for dust exposure in the workplace?
A. Enclosure of machines releasing dust
B. Wetting
C. Cleanliness of the workplace
D. Proper ventilation

4/ A patient working in a fireproof clothes factory presents with cyanosis, cough, dyspnea, chest pain, and clubbing. What is the most likely diagnosis?
A. Pneumoconiosis
B. Bagassosis
C. Talcosis
D. Asbestos

5/ Which of the following conditions is associated with eggshell calcification of the lymph nodes and is commonly caused by inhalation of silica dust?
A. Silicosis
B. tuberculosis
C. Asbestosis
D. Talcosis

6/ Which of the following occupational diseases is caused by the inhalation of sugarcane dust?
A. Silicosis
B. Bagassosis
C. Asbestosis
D. Pneumoconiosis

7/ Which of the following is a common complication of asbestosis?
A. Mesothelioma
B. Pulmonary embolism
C.Lung cancer
D. Chronic obstructive pulmonary disease (COPD)

8/ A 55-year-old coal miner presents with progressive shortness of breath and a history of long-term exposure to coal dust. What is the most likely complication?
A.Acute respiratory distress syndrome
B. Progressive fibrosis
C. Pulmonary embolism
D. Asthma

L6. Ischemic heart disease

1/ A 55 y.o man develops angina. He has no hypertension, diabetes, or obesity. Which of the following explains his CAD ?
A. Chronic smoking
B. Age and male sex
C. Lack of exercise
D. Excess alcohol intake
Answer: B. Age and male sex

2/ In dietary guidelines for the prevention of coronary artery disease, the recommended intake of saturated fats should be ?
A. Less than 300mg/day/adult *(Cholesterol)*
B. Less than 200 mg/dl *(Serum cholesterol)*
C. Must be proportionately increased *(Carbohydrates complex)*
D. Less than 10% of total energy intake
Answer: D. Less than 10% of total energy intake

3/ A 52 y.o presents with exertional chest discomfort. His total serum **cholesterol is 250 mg/dL**, **LDL is 170 mg/dL**, and **HDL is 30 mg/dL**. Which of the following explains his increased risk of CAD ?
A. Low LDL and high HDL protect his arteries
B. High LDL and low HDL accelerate atherogenesis
C. HDL transports cholesterol from liver to tissues
Answer: B. High LDL and low HDL accelerate atherogenesis

4/ Nicotine increases the risk of CAD by all of the following mechanisms EXCEPT ?
A. Stimulating adrenaline release resulting hypertension
B. Increasing myocardial oxygen demand
C. Raising HDL cholesterol
D. Carbon monoxide inducing atherogenesis
Answer: C. Raising HDL cholesterol

5/ A 29 y.o woman who has been taking medication for **rapid weight loss** presents with chest pain on exertion and shortness of breath. Her ECG shows ischemic changes suggestive of **coronary artery disease**. What's diagnosis and cause of her condition ?
A. Exogenous hyperestrogenemia
B. Obesity
C. Drug induced CAD - Misuse of fenfluramine and phentermine
Answer: C. Drug induced CAD - Misuse of fenfluramine and phentermine

6/ A 34 y.o woman presents with episodes of chest discomfort and shortness of breath. She has **been taking oral contraceptive pills** for the past 5 years and has no other medical conditions.
What is the most likely cause of her increased risk of developing coronary artery disease (CAD) ?
A. Endogenous estrogen deficiency
B. Exogenous hyperestrogenemia due to oral contraceptive use
C. Low progesterone levels
D. High HDL concentration
Answer: B. Exogenous hyperestrogenemia due to oral contraceptive use

7/ Cigarette smoking increases the risk of coronary artery disease synergistically when combined with ?
A. Diabetes mellitus
B. Hypertension and elevated serum cholesterol
C. Physical inactivity
D. Obesity
Answer: B. Hypertension and elevated serum cholesterol

8/ Which of the following best defines primordial prevention ?
A. Reduction of risk factors
B. Preventive care for at-risk group
C. Prevention of the emergence or development of risk factors
Answer: C. Prevention of the emergence or development of risk factors

9/ Consists reduction or modification of risk factors of disease. What level of prevention does this refer to ?
A. Primordial prevention
B. Primary prevention
C. Secondary prevention
Answer: B. Primary prevention

10/ The action which stops the progress of a disease in its early stage and prevents complications. What level of prevention does this refer to ?
A. Primordial prevention
B. Primary prevention
C. Secondary prevention
Answer: C. Secondary prevention

L7. RHD and HTN

1/ A 10-year-old boy lives in a **crowded house with poor ventilation** and **malnutrition.** What is the most effective primordial preventive measure against Rheumatic Fever?
A. Chemoprophylaxis with Benzathine Penicillin
B. Health education about sore throat
C. Improvement in living conditions
Answer: C. Improvement in living conditions

2/ During an outbreak of **streptococcal pharyngitis** in a school, close contacts of a confirmed case are given **Benzathine Penicillin**. This action represents?
A. Specific protection
B. Tertiary prevention
C. Disability limitation
Answer: A. Specific protection
🧠 secondary prophylaxis – 3 weeks

3/ A 55-year-old man with **central obesity** and **sedentary lifestyle** presents with **elevated BP.** Which modifiable risk factor is most important?
A. Age
B. Obesity
C. Gender
Answer: B. Obesity
🧠 modifiable

4/ BP becomes higher in **women after menopause** mainly due to?
A. Increased stress
B. Loss of estrogen
C. Weight gain
Answer: B. Loss of estrogen
🧠 sex – postmenopausal changes

5/ Hypertension is more common in people of **African descent** because of?
A. Lower renin activity and sodium sensitivity
B. Increased potassium
C. High calcium intake
Answer: A. Lower renin activity and sodium sensitivity
🧠 ethnicity

6/ A public health campaign encourages population-wide **DASH diet**, **less salt**, and **physical activity**. This represents?
A. Population strategy
B. High-risk strategy
C. Secondary prevention
Answer: A. Population strategy

7/ A clinic **screens** diabetics, obese adults, and pregnant women for blood pressure. The goal is to prevent progression before drug therapy is needed. This describes?
A. High-risk strategy
B. Population strategy
C. Secondary prevention
D. Tertiary prevention
Answer: A. High-risk strategy

8/ A 58-year-old man with uncontrolled hypertension develops **hemiplegia after a stroke.** Which preventive level does his **rehabilitation** program fall under?
A. Primary prevention
B. Secondary prevention
C. Tertiary prevention
Answer: C. Tertiary prevention

9/ A 52-year-old man on **antihypertensive therapy** comes **every month for BP check-ups**.
He has no new symptoms, and his readings **remain normal under regular drug use.** This approach mainly aims at?
A. Primary prevention
B. Secondary prevention
C. Tertiary prevention
Answer: B. Secondary prevention
🧠 regular follow-up – control of BP – lifelong drugs

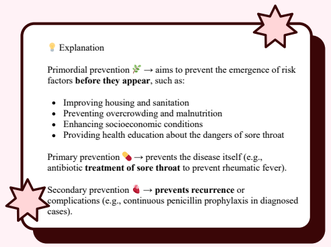
10/ Hypertension is found to be more common among people of **higher income** in developed **nations**, while in developing **countries it's rising among the lower class** due to **lifestyle** shifts. This factor influencing BP is best described as?
A. Obesity
B. Socioeconomic status
C. Physical inactivity
Answer: B. Socioeconomic status

L7. RHD and HTN past questions

1/ Which of the following populations is considered a high-risk group for rheumatic fever ?
A. Slum dwellers

2/ Which type of obesity has high risk of hypertension ?
A. Central obesity

3/ A public health team is implementing a community program to reduce the incidence of Rheumatic Heart Disease (RHD) in a developing country. Which of the following measures represents primordial prevention of RHD?
A. Improvement of living conditions and reduction of overcrowding



Microbiology



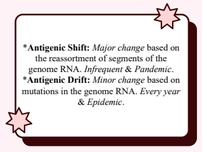
L1. Viral causes of respiratory tract infections

1/ A 25-year-old patient presents with **sneezing**, **nasal discharge**, **sore throat**, and mild headache that has lasted for 3 days. The patient reports **no fever** and mentions that these symptoms usually resolve in about a week. Based on the symptoms, which virus is most likely causing this illness?
A. Parainfluenza
B. Adenovirus
C. Rhinovirus
D. Respiratory syncytial virus
Answer: C, Rhinovirus

2/ Which of the following best explains why **Rhinovirus** primarily causes upper respiratory tract infections rather than lower respiratory tract infections?
A. Rhinovirus replicates better at 37°C, which is the normal body temperature *(replicates better at cooler temperatures 33°C)*
B. Rhinovirus attaches to ICAM-1 receptors on respiratory epithelial cells
C. Rhinovirus is highly resistant to stomach acid *(Rhinovirus is acid labile-sensitive)*
D. Rhinovirus causes systemic infections that affect the lungs *(Rhinovirus has a limited portal of entry;upper respiratory tract)*
Answer: B, Rhinovirus attaches to ICAM-1 receptors on respiratory epithelial cells

3/ A 6-year-old child presents with **conjunctivitis (pink eye)**, and it is found that the virus causing the infection is the **only one with a fiber protein protruding from each of the 12 vertices of its capsid**. What is the genome type of this virus?
A. Single-Stranded +ve RNA
B. Single-Stranded -ve RNA
C. Double-Stranded +ve DNA
D. Double-Stranded -ve DNA
Answer: C, Double-Stranded +ve DNA as the virus is *Adenovirus*

4/ During a **pandemic**, a 35-year-old healthcare worker presents with **fever, headache, and severe myalgia.** It is found that a **new** Influenza A variant, containing a **novel** hemagglutinin protein not previously seen, has emerged. What is the most likely cause of this **infrequent** change?
A. Antigenic shift
B. Antigenic drift
C. Mutation of neuraminidase
D. Spontaneous mutation
Answer: A, Antigenic Shift



5/ A 30-year-old patient presents to the clinic with **severe myalgia, fever, sore throat, and cough.** After testing, it is found that the virus has a **segmented, single-stranded, negative-polarity RNA genome**. This virus **does not undergo antigenic shift.** What is the most likely cause of the infection?
A. Influenza A
B. Influenza B
C. Rhinovirus
D. Adenovirus
Answer: B, Influenza B

6/ A 2-year-old child presents with a barking cough, hoarseness, and stridor. The child is diagnosed with croup. Which virus is most likely responsible for these symptoms?
A. Influenza
B. Parainfluenza
C. Adenovirus
D. Respiratory syncytial virus
Answer: B, Parainfluenza



7/ A **6-month-old infant** presents with difficulty breathing, wheezing, and a persistent cough. The child is diagnosed with **pneumonia** and **bronchiolitis**. Laboratory tests confirm the infant has **Respiratory Syncytial Virus (RSV).** What would be seen in isolation cell culture?
A. Multinucleated giant cells
B. Croup-like cells
C. Positive hemagglutinin test
D. Keratocytes
Answer: A, Multinucleated giant cells

8/ A **3-year-old child** presents with ear pain and drainage. The child is diagnosed with **otitis media.** Laboratory tests show the **presence of multinucleated giant cells** in the infected tissue. What is the most likely virus responsible for this infection?
A. Influenza
B. Parainfluenza
C. Adenovirus
D. Respiratory Syncytial Virus (RSV)
Answer: D, Respiratory Syncytial Virus (RSV)

L1. Viral causes of respiratory tract infections

9/ A patient is diagnosed with COVID-19, caused by a **Coronavirus**. In an electron microscope, **prominent club-shaped spikes** are visible on the virus's surface. What is the type of genome?

A. Segmented, single-stranded, +ve polarity RNA genome
B. Non-segmented, single-stranded, +ve polarity RNA genome
C. Non-segmented, single-stranded, -ve polarity RNA genome
D. Double-stranded, +ve polarity RNA genome

Answer: B, Non-segmented, single-stranded, +ve polarity RNA genome

10/ A patient is diagnosed with **COVID-19**, caused by **SARS-CoV-2.** The **spike protein** of the virus binds to a receptor on the surface of respiratory tract epithelial cells, which may contribute to **edema in the alveolar space.** How does the spike protein contribute to the pathogenesis?

A. It binds to angiotensin-converting enzyme 2 (ACE2)
B. It enhances viral replication by blocking immune cell entry.
C. It promotes viral shedding through nasal secretions.
D. It triggers immune responses by stimulating T-cell activation.

Answer: A, It binds to angiotensin-converting enzyme 2 (ACE2)

L1. Viral causes of respiratory tract infections
Past questions

1/ Which of the following viruses is associated with **ground-glass opacities** on chest CT scans and has camels as a potential animal reservoir, leading to severe respiratory infections in humans?
A. Influenza virus
B. Human rhinovirus
C. Coronavirus
D. Adenovirus

2/ In **influenza** infection, systemic symptoms such as **fever and severe myalgias** are not caused by viremia (which rarely occurs). These symptoms are mainly mediated by which of the following?
A. Hemagglutinin
B. Neuraminidase
C. Viral replication in muscle tissue
D. Cytokines

3/ Which of the following is formed by the action of the **fusion (F) protein** of the **Parainfluenza** virus, allowing infected cells to merge together?
A. Hemagglutinin spikes
B. Neuraminidase activity
C. Inclusion bodies
D. Multinucleated giant cells

4/ The **Rhinovirus**, a major cause of the common cold, initiates infection by binding to which of the following host cell receptors?
A. H1N1
B. H5N1
C. CoV-2
D. ICAM-1

5/ A 90-year-old patient presents with runny nose and fever. Testing reveals a **segmented**, **negative-sense RNA virus**. Which of the following is the most likely causative agent?
A. Influenza virus
B. Coronavirus
C. Respiratory syncytial virus (RSV)
D. Rhinovirus

6/ A woman received the influenza vaccine. Two months later, she presented with symptoms of common cold, sore throat, and runny nose. What is the most likely cause of her symptoms ?
A. Major change in the RNA genome
B. Antigenic shift
C. Minor change in the RNA genome
D. DNA reassortment

7/ Which member of the Orthomyxoviridae family is responsible for worldwide outbreaks ?
A. Parainfluenza virus
B. Respiratory syncytial virus
C. Influenza virus
D. Adenovirus

L2. Bacterial causes of upper respiratory tract infection

1/ A patient presents with a **sore throat, fever, and tender cervical lymph nodes**. The physician suspects a bacterial infection. After a throat swab is cultured, the growth shows small, translucent **β-hemolytic colonies**. The culture is **inhibited by bacitracin.**
Which group of Streptococcus is most likely responsible for this infection?
A. Group A Streptococcus (S. pyogenes)
B. Group B Streptococcus (S. agalactiae)
C. Group C Streptococcus
D. Group D Streptococcus (E. faecalis)
Answer: A, Group A Streptococcus (S. pyogenes)

2/ A patient with S. pyogenes infection develops **cellulitis** with rapid spread of infection in the skin. The laboratory confirms that **S. pyogenes** produces an enzyme known as **hyaluronidase**, which contributes to the **spread of infection.**
What is the enzyme's role in the pathogenesis?
A. It cleaves hyaluronic acid, facilitating the spread of infection in tissues
B. It activates plasminogen, leading to clot dissolution and bacterial invasion *(Streptokinase)*
C. It destroys DNA in infected tissues, preventing immune recognition *(DNase/ streptodornase)*
D. It stimulates T-cell activation, contributing to the inflammatory response
Answer: A, It cleaves hyaluronic acid, facilitating the spread of infection in tissues

3/ A 10-year-old patient presents with **periorbital edema** and **"smoky" urine** following a **recent skin infection.** The physician suspects **post-streptococcal glomerulonephritis (AGN).**
What is the most likely cause of **acute glomerulonephritis** in this patient?
A. Autoimmune reaction triggered by the M protein of S. pyogenes
B. Antigen-antibody complexes deposited on the glomerular basement membrane.
C. Streptococcal toxins causing direct damage to the glomerular cells
D. Viral infection leading to renal damage
Answer: B, Antigen-antibody complexes deposited on the glomerular basement membrane

4/ A 12-year-old patient presents with **fever, migratory polyarthritis, and carditis** following a **recent pharyngitis**. The patient has a history of streptococcal throat infection. Laboratory tests show an **elevated anti-streptolysin O (ASO) titer and erythrocyte sedimentation rate (ESR).**
What is the most likely cause of the patient's **acute rheumatic fever** symptoms?
A. Direct bacterial invasion of tissues, causing inflammation in the heart and joints
B. Immune response to M proteins, leading to cross-reactivity with joint, heart, and brain tissues
C. Post-infectious immune complex deposition, causing tissue damage in multiple organs
D. Cytokine storm, leading to widespread tissue damage
Answer: B, Immune response to M proteins, leading to cross-reactivity with joint, heart, and brain tissues

5/ A 50-year-old patient with a history of **dental procedures** presents with **fever, heart murmur**, and **anemia**. Blood cultures reveal the **presence of Streptococcus sanguis**, and the patient is diagnosed with **endocarditis**. What factor may have contributed to the diagnosis?
A. Dental procedures
B. Urinary tract infection
C. Gastrointestinal bleeding
D. Skin infection
Answer: A, Dental procedures

6/ A 60-year-old patient with a history of **urinary tract infections** presents with **fever** and **heart murmur**. Blood cultures show **Enterococcus faecalis**, and the diagnosis is **endocarditis**.
What factor may have contributed to the diagnosis?
A. Dental procedures
B. Urinary tract infection
C. Invasive surgical procedure
D. Skin infection
Answer: B, Urinary tract infection

7/ A 55-year-old patient **recently visited the dentist**, and shortly after the visit, he presented with **fever, heart murmur, anemia**, and was diagnosed with **endocarditis**. Blood cultures revealed **gram-positive cocci in chains**, which are **catalase-negative** and show **α-hemolysis**.
which of the following properties would be expected from the organism identified in this patient?
A. Sensitive to optochin and dissolved by bile
B. Sensitive to optochin and not dissolved by bile
C. Resistant to optochin and dissolved by bile
D. Resistant to optochin and not dissolved by bile
Answer: D, Resistant to optochin and not dissolved by bile

8/ A 60-year-old patient presents with **endocarditis**. Blood cultures show a **small gram-negative rod** that is **slow-growing** and **requires high CO2 levels to grow in culture.**
Which group of bacteria is most likely responsible for this infection?
A. Viridans group streptococci
B. Enterococcus faecalis
C. HACEK organisms
D. Staphylococcus aureus
Answer: C, HACEK organisms

L2. Bacterial causes of upper respiratory tract infection

9/ A 10-year-old patient presents with fever, sore throat, and cervical adenopathy. On examination, the patient has a **gray pseudomembrane on the tonsils and throat**, which **bleeds when scraped.** The patient is diagnosed with **diphtheria**.
What is the mechanism by which the **diphtheria toxin** causes damage to host cells?
A. Activation of immune cells leading to systemic inflammation
B. Inhibition of protein synthesis through ADP-ribosylation of elongation factor-2 (EF-2)
C. Inhibition of DNA replication in host cells
D. Inhibition of RNA transcription, leading to cell death
Answer: B, Inhibition of protein synthesis through ADP-ribosylation of elongation factor-2 (EF-2)

10/ A throat culture on a tellurite plate from a suspected diphtheria patient grows **gram-positive rods** that appear **club-shaped and in palisades or V-shaped formations.** What is the characteristic staining property of **Corynebacterium diphtheriae** when observed under a **methylene blue stain**?
A. The bacteria stain blue and the granules stain red
B. The bacteria stain red and the granules stain blue
C. The bacteria stain green and the granules stain blue
D. The bacteria stain blue and the granules stain green
Answer: A, The bacteria stain blue and the granules stain red as the granules stain metachromatically

11/ A 12-year-old patient is diagnosed with diphtheria and shows a **gray pseudomembrane in the throat.** The physician orders a **test for toxin production** to confirm the diagnosis.
Which test is used to confirm the production of diphtheria toxin?
A. Schick's test
B. PCR for toxin gene
C. Elek test (antibody-based gel diffusion precipitin test)
D. Blood culture for Corynebacterium diphtheria
Answer: C, Elek test (antibody-based gel diffusion precipitin test)

12/ A patient with **diphtheria** develops **severe complications** such as **airway obstruction** due to the extension of the pseudomembrane into the larynx and trachea as well as **myocarditis** and **nerve weakness**. What is the immediate treatment for this patient and what should be considered in the management of this condition?
A. Antitoxin administration
B. Antibiotic therapy alone
C. Steroids for reducing inflammation in the airways
D. Waiting for lab results before initiating treatment
Answer: A, Antitoxin administration as the decision to treat with antitoxin is clinical and cannot wait for lab results

13/ An **elderly patient** with **chronic obstructive pulmonary disease (COPD)** develops **bronchitis** and **pneumonia**. **Moraxella catarrhalis** is identified as the causative organism.
How is Moraxella catarrhalis primarily transmitted?
A. Fecal-oral route
B. Direct contact with infected skin
C. Respiratory aerosol
D. Contaminated food or water
Answer: C, Respiratory aerosol

14/ Which of the following conditions is Moraxella catarrhalis most commonly associated with in children?
A. Pneumonia and bronchitis
B. Otitis media and sinusitis
C. Meningitis and sepsis
D. Gastroenteritis and diarrhea
Answer: B, Otitis media and sinusitis

15/ Which of the following characteristics is true of **Moraxella catarrhalis**, the most likely cause of this infection?
A. Gram-positive coccus
B. Gram-positive bacillus
C. Gram-negative bacillus
D. Gram-negative coccobacillary
Answer: D, Gram-negative coccobacillary

L2. Bacterial causes of upper respiratory tract infection
Past questions

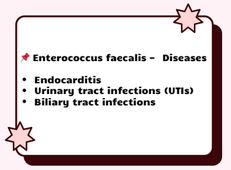
1/ A patient with a history of rheumatic heart disease presents with fever and a new **heart murmur** after undergoing dental surgery. Blood cultures reveal **alpha-hemolytic bacteria.**
Which bacteria is most likely responsible?
A. Staphylococcus aureus
B. Viridians streptococcus
C. Escherichia coli
D. Pseudomonas aeruginosa

2/ A child presents with fever, a rash, **strawberry tongue**, flushed cheeks, and a recent strep throat diagnosis. What is the most likely diagnosis?
A. Pharyngitis
B. Endometritis
C. Streptococcal toxic shock syndrome
D. Scarlet fever

3/ Which of the following bacteria is known for having **metachromatic granules?**
A. Staphylococcus aureus
B. Corynebacterium diphtheriae
C. Escherichia coli
D. Pseudomonas aeruginosa

4/ A patient suffers from endocarditis after having valve replacement surgery. A sample taken from his tissue reveals **Streptococcus viridians.** Which of the following mediates this bacteria's adherence to the prosthetic valve?
A. M protein
B. Exotoxin A
C. Streptokinase
D. Glycocalyx

5/ Which of the following is the **most important presentation** of rheumatic fever ?
A. Elevated ESR
B. Strawberry tongue
C. Migratory polyarthritis
D. Paralysis



6/ Which of the following infections is commonly caused by **Enterococci**?
A. Pneumonia
B. Meningitis
C. Urinary tract infection
D. Tetanus

7/ A patient develops inflammation characterized by antibodies against streptococcal **M protein** that cross-react with antigens in the **joints, heart, and brain tissues** several weeks after a throat infection. The condition is greatly exacerbated by recurrent streptococcal infections. Which of the following is the most likely diagnosis?
A. Acute glomerulonephritis
B. Acute rheumatic fever
C. Streptococcal toxic shock syndrome
D. Scarlet fever

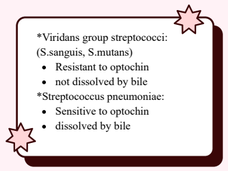
8/ Which of the following antigenic enzymes produced by **Streptococcus pyogenes is oxygen-labile,** causes β-hemolysis in **deep cuts of blood agar**, and is used in the diagnosis of Rheumatic fever through detection of its antibodies?
A. Streptokinase
B. DNase
C. Hyaluronidase
D. Streptolysin O

9/ What is the function of the A subunit in diphtheria toxin?
A. Binds to host cell receptor
B. Forms pores in the membrane
C. Inhibits ribosomal translocation
D. Stimulates adenylate cyclase

10/ What's the most important virulence factor that is responsible for its anti phagocytic properties and inhibited by bacitracin ?
A. Lipopolysaccharides
B. M protein
C. Capsule
D. Streptolysin O

L3. Bacterial causes of lower respiratory tract infection I

1/ What is the key feature that differentiates **Streptococcus pneumoniae** from Viridans group streptococci in laboratory testing?
A. Sensitive to optochin and dissolved by bile
B. Sensitive to optochin and not dissolved by bile
C. Resistant to optochin and dissolved by bile
D. Resistant to optochin and not dissolved by bile
Answer: A, Sensitive to optochin and dissolved by bile



2/ What is the **main virulence factor** of **Streptococcus pneumoniae** responsible for its pathogenicity in pneumonia?
A. Polysaccharide capsule, which interferes with phagocytosis
B. Lipoteichoic acid, which activates complement and induces cytokine production
C. Pneumolysin, which causes α-hemolysis
D. IgA protease, which enhances colonization of the upper respiratory tract
Answer: A, Polysaccharide capsule, which interferes with phagocytosis

3/ How can the capsular type of **Streptococcus pneumoniae**, which has **more than 85 antigenically distinct polysaccharide types** be identified?
A. By PCR analysis to detect the specific genes for capsular production
B. By culturing the bacteria on bile esculin agar
C. By performing a Quellung reaction, which causes capsular swelling
D. By testing for catalase activity
Answer: C, By performing a Quellung reaction, which causes capsular swelling

4/ A 55-year-old woman, presents with **sudden fever**, **cough**, and **pleuritic chest pain**. She also has a **rusty-colored sputum**. She underwent a **splenectomy** several years ago. Based on her symptoms, What is the **leading cause of sepsis** in this patient?
A. Streptococcus pneumoniae, which causes sepsis in asplenic patients
B. Staphylococcus aureus, which is a common cause of sepsis in the immunocompromised
C. Escherichia coli, which can lead to sepsis in patients with urinary tract infections
D. Pseudomonas aeruginosa, which is associated with sepsis in patients with cystic fibrosis
Answer: A, Streptococcus pneumoniae, which causes sepsis in asplenic patients

5/ What is the primary reason **sickle cell anemia increases the risk of pneumococcal infections**?
A. Autoimmune reactions, damaging the body's defense against bacteria
B. Chronic inflammation, which weakens the immune system
C. Increased susceptibility to viral infections, causing secondary bacterial infections
D. Spleen dysfunction, leading to impaired bacterial clearance due to splenic infarction
Answer: D, Spleen dysfunction, leading to impaired bacterial clearance due to splenic infarction

6/ A 60-year-old patient with **fever, pleuritic chest pain**, and **rusty-colored sputum** presents with suspected pneumonia. The gram stain of the sputum shows?
A. Gram +ve, cocci in chains
B. Gram +ve, lancet-shaped diplococci
C. Gram -ve, coccobacillary rod
D. Stain poorly with gram stain
Answer: B, Gram +ve, lancet-shaped diplococci

7/ A 3-year-old child presents with **fever, headache, stiff neck**, and **drowsiness**. The child is diagnosed with **meningitis**. Blood cultures grow **Haemophilus influenzae type b.**
What is required for their growth on **chocolate agar**?
A. Factor X (heme) and factor V (NAD) for energy production
B. Bile salts and sugar fermentation for colony formation
C. Bacitracin and high temperature for inhibition of growth
D. Blood agar only, without additional supplements
Answer: A, Factor X (heme) and factor V (NAD) for energy production

8/ A 2-year-old child presents with a **severe paroxysmal cough that ends with an inspiratory "whoop."** The child has had mild upper respiratory tract symptoms for several days. A nasopharyngeal swab is taken, and **Bordetella pertussis is cultured**.
Which of the following is a characteristic feature of Bordetella pertussis?
A. Gram-positive coccobacilli, encapsulated
B. Gram-negative coccobacilli, encapsulated
C. Gram-positive rods, non-encapsulated
D. Gram-negative rods, non-encapsulated
Answer: B, Gram-negative coccobacilli, encapsulated

L3. Bacterial causes of lower respiratory tract infection I

9/ What is the primary role of **filamentous hemagglutinin** in the pathogenesis of **Bordetella pertussis**?
A. It stimulates adenylate cyclase, resulting in edema of the respiratory mucosa.
B. It stimulates production of endotoxin in the respiratory tract
C. It mediates attachment of the bacteria to the ciliated epithelial cells of the respiratory tract
D. It damages the ciliated cells, leading to inflammation
Answer: C, It mediates attachment of the bacteria to the ciliated epithelial cells of the respiratory tract

10/ What is the primary method used to diagnose **Bordetella pertussis (highly contagious disease)**?
A. Blood culture and gram stain
B. Quellung reaction to identify the capsular type
C. Polymerase chain reaction (PCR) to detect the presence of Bordetella pertussis DNA
D. Serology for detecting pertussis toxin antibodies
Answer: C, Polymerase chain reaction (PCR) to detect the presence of Bordetella pertussis DNA

11/ A 3-year-old child with **whooping cough** caused by **Bordetella pertussis** presents with **severe coughing fits.** The blood tests show **lymphocytosis**, and the physician suspects a toxin is involved in the pathogenesis of the disease. What is the most likely mechanism contributing to the **lymphocytosis** in this patient?
A. Inhibition of chemokine receptors, preventing lymphocytes from returning to lymphoid tissue
B. Damage to ciliated cells, leading to airway obstruction and inflammation
C. Stimulation of adenylate cyclase, leading to increased cAMP and edema in the respiratory mucosa
D. Activation of immune cells, resulting in excessive cytokine production
Answer: A, Inhibition of chemokine receptors, preventing lymphocytes from returning to lymphoid tissue (Pertussis toxin)

12/ A 5-year-old child with whooping cough caused by **Bordetella pertussis** presents with **severe coughing fits.** The blood tests show **lymphocytosis**, and the child is experiencing **edema** of the respiratory mucosa. What is the most likely mechanism contributing to the **edema** in this patient?
A. Inhibition of chemokine receptors, preventing lymphocytes from returning to lymphoid tissue
B. Damage to ciliated cells, leading to airway obstruction and inflammation
C. Stimulation of adenylate cyclase, leading to increased cAMP and edema in the respiratory mucosa
D. Activation of immune cells, resulting in excessive cytokine production
Answer: C, Stimulation of adenylate cyclase, leading to increased cAMP and edema in the respiratory mucosa (Pertussis toxin)

13/ A 3-year-old child with **whooping cough** caused by **Bordetella pertussis** presents with **severe coughing fits** and **airway obstruction**. The child is found to have **damage to the ciliated epithelial cells in the respiratory tract**. What is the most likely mechanism contributing to the damage to the ciliated epithelial cells in this patient?
A. Filamentous hemagglutinin
B. Pertussis toxin
C. Inhibition of chemokine receptors
D. Tracheal cytotoxin
Answer: D, Tracheal cytotoxin

L3. Bacterial causes of lower respiratory tract infection I
Past questions

1/ Which alpha-hemolytic bacterium has its growth inhibited by **optochin**?
A. Streptococcus pneumoniae
B. Streptococcus viridans
C. Enterococcus faecalis
D. Staphylococcus aureus

2/ The serotype of **Haemophilus influenzae** is determined by which of the following?
A. Lipopolysaccharide (LPS)
B. Teichoic acid
C. Flagellar antigen
D. Polysaccharide capsule

3/ What is the mechanism of action of **pertussis toxin** ?
A. Induce nitric oxide
B. Inhibits protein synthesis
C. Stimulates adenylate cyclase
D. Inhibits DNA replication

L4. Bacterial causes of lower respiratory tract infection II

1/ A farmer handling **animal hides** develops a **painless skin ulcer** with a **black eschar** and **massive local edema**. Gram stain of the lesion shows **large, gram-positive rods with square ends in chains.** Which unique feature of the capsule allows **Bacillus anthracis** to **evade phagocytosis**?
A. Polysaccharide capsule composed of glucose polymers
B. Capsule composed of D-glutamate
C. Capsule composed of N-acetylmuramic acid
D. Capsule composed of glycoproteins
Answer: B, Capsule composed of D-glutamate

2/ A 40-year-old worker in a **wool factory** presents with **flu-like symptoms** that rapidly progress to **hemorrhagic mediastinitis** and **bloody pleural effusions**. Chest X-ray reveals **mediastinal widening**. The condition is identified as **pulmonary anthrax**, transmitted by **inhalation of spores.** Which component of the **anthrax toxin** complex functions by **forming pores that allow entry of other toxin subunits**?
A. Protective antigen
B. Edema factor
C. Lethal factor
D. D-glutamate capsule
Answer: A, Protective antigen

3/ A laboratory technician is exposed to **aerosolized Bacillus anthracis spores**. These **spores**, which can **persist in soil for years**, were accidentally released during an experiment. A few days later, he develops **pulmonary anthrax** with **edema** of the respiratory mucosa, caused by **increased cyclic AMP (cAMP) levels**.Which **toxin** is directly responsible for this finding?
A. Protective antigen
B. Edema factor
C. Lethal factor
D. Endotoxin
Answer: B, Edema factor

4/ A 50-year-old man **eats contaminated meat** and develops **gastrointestinal anthrax** with **abdominal pain, bloody diarrhea, and rapid progression to shock.** Autopsy shows widespread intestinal **necrosis**. Which **anthrax toxin** is most responsible for the **cell death** and **necrosis** in this patient?
A. Protective antigen
B. Edema factor
C. Lethal factor
D. Endotoxin
Answer: C, Lethal factor

5/ In a suspected **bioterrorism attack**, a patient presents with sudden respiratory distress and is suspected of having **pulmonary anthrax.** Rapid diagnosis is essential. Which test would provide the **fastest** and most **specific** diagnosis?
A. Gram stain of sputum showing spores
B. Polymerase chain reaction (PCR) for anthrax genes
C. Non-hemolytic colonies on blood agar
D. Ziehl-Neelsen stain
Answer: B, Polymerase chain reaction (PCR) for anthrax genes

6/ A 27-year-old man from a rural area presents with **painful**, **swollen inguinal lymph nodes (buboes)**, **high fever**, and **myalgias after being bitten by a flea from a dead rodent**. Blood smear reveals **gram-negative rods** with a **safety-pin appearance** on **Wayson stain**. Which type of bacterium is the most likely cause of this patient's illness?
A. Gram-negative rod, bipolar staining
B. Gram-positive cocci in clusters
C. Gram-positive rod with spores
D. Gram-negative curved rod
Answer: A, Gram-negative rod, bipolar staining

7/ A 21-year-old student working in a **wildlife park** develops **high fever, myalgias, and buboes** after being **exposed to rodents**. Lab studies show **Yersinia pestis infection**. Which **virulence factor** allows the **organism to survive and grow intracellularly**?
A. V and W antigens
B. Yops proteins
C. Exotoxin
D. Endotoxin
Answer: A, V and W antigens

8/ A 50-year-old man with **plague** develops **disseminated intravascular coagulation (DIC)** and **cutaneous hemorrhages**, producing **black lesions on the skin** ("**Black Death**"). Which **virulence factor** of **Yersinia pestis** is primarily responsible for this effect?
A. V and W antigens
B. Yops protein
C. Exotoxin
D. Endotoxin
Answer: D, Endotoxin

L4. Bacterial causes of lower respiratory tract infection II

9/ A **65-year-old man** with **diabetes** and **chronic respiratory disease** develops **cough** and **bloody sputum**. He is diagnosed with **Klebsiella pneumoniae**. Culture on **MacConkey agar** shows **large**, **mucoid**, **lactose-fermenting colonies**. Which structural feature is primarily responsible for the **mucoid appearance of its colonies** and **resistance** to **phagocytosis**?

A. Flagella for motility
B. Fimbriae for adherence
C. Endospores in the cell wall
D. Large polysaccharide capsule

Answer: D, Large polysaccharide capsule

10/ A **58-year-old alcoholic** presents with **high fever, shortness of breath, and a cough** producing **thick, bloody, mucoid sputum** described as "**currant-jelly sputum**." Chest imaging shows **consolidation** and **necrosis**.Which pathogen is the most likely cause of this patient's pneumonia?

A. Acinetobacter baumannii
B. Mycoplasma pneumoniae
C. Klebsiella pneumoniae
D. Pseudomonas aeruginosa

Answer: C, Klebsiella pneumoniae

11/ A 70-year-old man with **indwelling urinary catheter** develops fever and dysuria. Urine culture reveals **small, gram-negative coccobacilli** that are **soil and water organisms**, but also known to **colonize the skin and upper respiratory tract**. What is the most likely pathogen in this case?

A. Acinetobacter baumannii
B. Mycoplasma pneumoniae
C. Klebsiella pneumoniae
D. Pseudomonas aeruginosa

Answer: A, Acinetobacter baumannii

12/ A 58-year-old ICU patient develops **pneumonia** after **prolonged use of a ventilator**. Cultures reveal **small, gram-negative coccobacilli** identified as **Acinetobacter baumannii**, an **opportunistic pathogen** found in **soil**, **water**, and **hospital equipment**. Which feature **most complicates** its **management** in hospital-acquired infections?

A. It is remarkably antibiotic resistant
B. It is transmitted by zoonotic exposure to livestock
C. It produces a potent endotoxin that causes septic shock
D. It requires chocolate agar with factor X and V for growth

Answer: A, It is remarkably antibiotic resistant

L4. Bacterial causes of lower respiratory tract infection II
Past questions

1/ In which bacterium the **V and W** factors are found ?
A. Klebsiella pneumoniae
B. Yersinia pestis
C. Bacillus anthracis
D. Acinetobacter

2/ The typical lesion of cutaneous **anthrax** is known as ?
A. Painful ulcer
B. Buboes
C. Malignant pustule
D. Pustular abscess

3/ A sample was taken and found to have bloody, **jelly-like sputum** and **lactose-fermenting** colonies on **MacConkey's agar.** What is the most likely causative agent ?
A. Yersinia pestis
B. Bacillus anthracis
C. Klebsiella pneumoniae
D. Acinetobacter

4/ Malignant pustule causative agent properties ?
A. Gram positive lancet shaped cocci
B. Small gram negative rods
C. Large gram positive rods in chains
D. Gram negative coccobacillary rods

L5. Bacteria causing atypical pneumonia

1/ A farm worker develops fever, **pneumonia**, and **hepatitis** after animal delivery. There is no skin rash, and **ELISA** confirms the diagnosis. What's the diagnosis ?
A. Typhus
B. Q fever
C. Scrub typhus
D. Leptospirosis
Answer: B. Q fever (Coxiella burnetii)

2/ Which bacterium causes **atypical pneumonia** acquired from **birds**, is **obligate intracellular**, **lacks peptidoglycan**, and forms **cytoplasmic inclusions** in respiratory cells ?
A. Legionella pneumophila
B. Chlamydia pneumoniae
C. Coxiella burnetii
D. Chlamydophila psittaci
Answer: D. Chlamydia psittaci

3/ A 26 y.o presents with fever, myalgia, cough producing **whitish non-bloody sputum**. Chest X-ray shows **prominent infiltrates**, and **positive cold agglutinin test, Eaton agar reveals fried egg colonies.** there is **no improvement with penicillin**
What is the causative organism and the most specific test to confirm the diagnosis ?
A. Legionella pneumophila - Culture on charcoal yeast extract agar
B. Streptococcus pneumoniae - Optochin sensitivity
C. Mycoplasma pneumoniae - Complement fixation test
D. Coxiella burnetii - ELISA
Answer: C. Mycoplasma pneumoniae - Complement fixation test

4/ Which of the following findings distinguishes Legionnaires' disease from Pontiac fever ?
A. Hyponatremia, pneumonia
B. Transmitted from person to person
C. Exotoxin
D. Muscle pain and fever
Answer: A. Hyponatremia ($Na+<130\ mEq/L$), pneumonia

5/ A 22 y.o man presents with **dry cough**, **fatigue**, and **cyanotic discoloration** of the **hands**, **nose** and **knees** after **cold exposure**. Labs show **mild anemia**, and **RBCs agglutination**. Which mechanism explains his symptoms ?
A. IgG antibodies against RBCs
B. Cold reactive IgM antibodies causing hemolysis
C. Direct bacterial invasion of RBCs
D. Toxin mediated hemolysis
Answer: B. Cold reactive IgM antibodies causing hemolysis

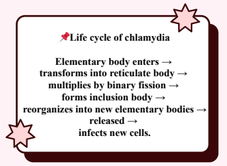
6/ A 45 y.o **poultry** worker presents with **fever**, **joint pain**, and a persistent **dry cough.**
He reports frequent exposure to poultry and dry bird feces.
Chest X-ray suggest **atypical pneumonia**. Which of the following organisms is the cause of infection?
A. Legionella pneumophila
B. Mycoplasma pneumoniae
C. Chlamydia pneumoniae
D. Chlamydia psittaci
Answer: D. Chlamydia psittaci

7/ A **hospital outbreak of pneumonia** among **elderly** patients who have no direct contact with each other but share the **same water supply**. The bacteria requires **iron** and **cysteine** for growth on **BCYE agar**.
What are the properties of this organism ?
A. Coccobacillary gram negative rods
B. Gram positive diplococci with polysaccharide capsule
C. Gram negative rod
D. Pleomorphic organism with cholesterol membrane
Answer: C. Gram negative rod *(Legionella pneumophila)*

8/ In a **Giemsa-stained** smear from a **atypical pneumonia** patient, **cytoplasmic inclusion bodies** are seen inside epithelial cells that **lack peptidoglycan wall**. What's the organism ?
A. Legionella pneumophila
B. Coxiella burnetii
C. Chlamydia pneumoniae
D. Mycoplasma pneumoniae
Answer: C. Chlamydia pneumoniae

9/ Which test provides the fastest diagnostic confirmation for Legionella pneumophila infection ?
A. Blood culture
B. Urinary antigen test
C. Serology
D. Sputum Gram stain
Answer: B. Urinary antigen test

10/ During the intracellular stage of chlamydia infection, the reticulate body multiplies inside the host cell. Which process does it use for replication ?
A. Budding
B. Fragmentation
C. Binary fission
D. Spore formation
Answer: C. Binary fission



L5. Bacteria causing atypical pneumonia
Past questions

1/ A patient is diagnosed with Legionella pneumophila infection. Which of the following is the rapid diagnostic test for this infection?
A. Charcoal yeast extract agar
B. Chest X-ray
C. Urinary L. pneumophila antigens
D. Direct fluorescent antibody (DFA) test

2/ A patient is diagnosed with cold agglutination disease. What is the most appropriate diagnostic test ?
A. Complement fixation test
B. Cold agglutinin test
C. Sputum culture
D. Blood culture

3/ A patient presents with symptoms of atypical pneumonia. Normal culturing does not show any colonies, but a special culture with added nutrition shows “fried-egg” shaped colonies.
What is the most likely causative organism?
A. Legionella pneumophila
B. Chlamydia pneumoniae
C. Streptococcus pneumoniae
D. Mycoplasma pneumoniae

4/ Which of the following bacteria is the causative agent of Q fever?
A. Mycoplasma pneumoniae
B. Coxiella burnetii
C. Chlamydia psittaci
D. Rickettsia rickettsii

5/ A 55-year-old man presents with symptoms of atypical pneumonia, including fever, cough, and shortness of breath. Laboratory results show hyponatremia (serum sodium < 130 mEq/L). Based on the clinical findings, which of the following is the most likely causative organism?
A. Mycoplasma pneumoniae
B. Legionella pneumophila
C. Chlamydia pneumoniae
D. Coxiella burnetii

6/ A patient with atypical pneumonia has cytoplasmic inclusion bodies seen in a Giemsa stain of their sputum. Which bacteria is most likely causing the infection?
A. Chlamydia pneumoniae
B. Mycoplasma pneumoniae
C. Legionella pneumophila
D. Coxiella burnetii

7/ A 33-year-old man presents with low-grade fever, dry cough, and shortness of breath that started 6 days ago. Chest X-ray shows patchy infiltrates, and a Giemsa stain reveals cytoplasmic inclusion bodies. What is the most remarkable characteristic of the causative organism?
A. Gram-negative rod
B. Production of exotoxins
C. Lack of peptidoglycan
D. Growth on charcoal yeast extract agar

8/ A patient with atypical pneumonia tests positive for cold agglutinins. Which bacteria is most likely responsible for this condition?
A. Mycoplasma pneumoniae
B. Legionella pneumophila
C. Chlamydia pneumoniae
D. Coxiella burnetii

L6. Tuberculous and Non-tuberculous mycobacteria infections I

1/ A sputum smear from a suspected tuberculosis case shows red rods against a blue background on Ziehl-Neelsen stain. The acid-fastness of these bacilli is due to:
A. Capsule of polysaccharides
B. Mycolic acid in the cell wall
C. Peptidoglycan cross-linking
D. Lipopolysaccharide (LPS)
Answer: B. Mycolic acid in the cell wall

2/ Which is true regarding IGRA tests (Quantiferon-TB / T-spot.TB)?
A. Affected by BCG vaccination
B. Requires two patient visits
C. Not affected by prior BCG vaccination
D. Measures IL-2 release
Answer: C. Not affected by prior BCG vaccination

3/ A 45-year-old HIV-positive man presents with cavitary upper-lobe lesions and positive AFB sputum. Which mechanism explains the infection?
A. Exotoxin production
B. Intracellular survival in macrophages
C. Spore formation
D. Capsule-mediated resistance
Answer: B. Intracellular survival in macrophages

4/ A 40-year-old immunocompromised man develops generalized weakness and fever. Microscopy reveals multiple caseating granulomas with Langhans giant cells. Which of the following immune mechanisms is responsible for this lesion?
A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Type IV (cell-mediated) hypersensitivity
Answer: D. Type IV (cell-mediated) hypersensitivity

5/ A 32-year-old man with AIDS develops severe disseminated tuberculosis. Which of the following explains the increased susceptibility in such patients?
A. Decreased humoral immunity
B. Loss of $CD4^+$ T-cell–mediated immunity
C. Enhanced macrophage activity
D. Increased antibody-dependent cytotoxicity
Answer: B. Loss of $CD4^+$ T-cell–mediated immunity

6/ Cord factor (trehalose dimycolate) in M. tuberculosis contributes to virulence by:
A. Inducing toxin secretion
B. Preventing phagosome–lysosome fusion
C. Enhancing antibody production
D. Promoting complement activation
Answer: B. Preventing phagosome–lysosome fusion

7/ A 34-year-old man with HIV infection develops disseminated tuberculosis. Mutation in which gene increases susceptibility to severe disease due to impaired killing of mycobacteria in macrophages?
A. Nramp gene
B. Rb gene
C. CFTR gene
D. HFE gene
Answer: A. Nramp gene

8/ A 45-year-old farmer develops cervical lymph node enlargement. Biopsy shows caseating granulomatous inflammation due to Mycobacterium species. Which term best describes this condition?
A. Miliary tuberculosis
B. Scrofula
C. Pott's disease
D. Ghon complex
Answer: B. Scrofula

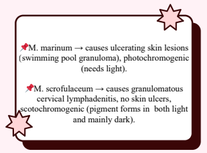
9/ A patient presents with back pain, fever, and destruction of thoracic vertebrae seen on imaging. The most likely diagnosis is?
A. Pott's disease
B. Scrofula
C. Renal tuberculosis
D. Miliary tuberculosis
Answer: A. Pott's disease

10/ A 5-year-old child develops intestinal tuberculosis after consuming unpasteurized milk. Which organism is most likely responsible?
A. M. tuberculosis
B. M. bovis
C. M. scrofulaceum
D. M. leprae
Answer: B. M. bovis

L7. Tuberculous and Non-tuberculous mycobacteria infections II

1/ A 45 y.o patient with **chronic lung disease** presents with productive cough and hemoptysis. Acid-fast bacilli are seen. **Culture grows yellow colonies only in light**. What is the causative organism ?
A. M. tuberculosis
B. M. kansasii
C. M. avium-intracellulare complex
D. M. scrofulaceum
Answer: B. M. kansasii

2/ A **10 y.o** boy with a painless neck swelling. He swam daily in a nearby **lake**. Examination reveals firm, **non-tender cervical lymph nodes**. Biopsy shows **granulomatous cervical adenitis** without any skin lesions or ulcers. Culture shows a **slow-growing, scotochromogenic** that produces **yellow pigment even in darkness.** What's the organism ?
A. M. marinum
B. M. avium-intracellulare complex
C. M. scrofulaceum
D. M. ulcerans
Answer: C. M. scrofulaceum



3/ A 38 y.o **HIV-positive** man **(CD4 = 90 cells/µL)** presents with fever, weight loss, and chronic cough. Chest X-ray shows **diffuse infiltrates**. Culture reveals a **nonchromogenic** mycobacterium isolated from **water** that is **not responsive to standard anti-TB therapy**. What's the organism ?
A. M. tuberculosis
B. M. kansasii
C. M. avium–intracellulare complex
D. M. marinum
Answer: C. M. avium–intracellulare complex

4/ A 42 y.o presents with a painful ulcer with surrounding nodules on his hand that appeared two weeks after he **cut himself while cleaning freshly caught fish**. The lesion shows **granulomatous** inflammation. What is the most likely organism ?
A. M. kansasii
B. M. marinum
C. M. ulcerans
D. M. scrofulaceum
Answer: B. M. marinum

5/ A culture from a **genital swab** of a healthy **man** shows **rapidly growing bacilli**. The organism b is **part of the normal flora** that collects under the **foreskin of the penis.** What is the most likely organism ?
A. Mycobacterium fortuitum
B. Mycobacterium smegmatis
C. Mycobacterium abscessus
D. Mycobacterium scrofulaceum
Answer: B. Mycobacterium smegmatis

6/ A **9 y.o** from a **tropical rural wetland** in West Africa develops a **painless, necrotizing ulcer** with undermined edges on his leg. The lesion began as a small papule **following minor skin trauma while wading in stagnant water**. The organism is **nonchromogenic**, and grows best at **30°C**. What is the most likely organism ?
A. Mycobacterium marinum
B. Mycobacterium ulcerans
C. Mycobacterium scrofulaceum
D. Mycobacterium tuberculosis
Answer: B. Mycobacterium ulcerans

7/A **diver** presents with a **crusted lesion on his hand that started as a single pustule**. After several weeks, **additional nodules formed along lymphatic drainage (sporotrichoid spread)**. The pathogen produces a **yellow-orange pigment in light**. What's the organism ?
A. M. kansasii
B. M. marinum
C. M. abscessus
D. M. ulcerans
Answer: B. M. marinum

8/ A 28 y.o man presents with skin infection at a **tattoo site** few days after gardening in moist **soil**. The infection is caused by a **nonchromogenic** organism found in **soil and water** and **resistant to antituberculosis drugs**. What's the organism ?
A. M. kansasii
B. M. fortuitum–chelonae complex
C. M. ulcerans
D. M. tuberculosis
Answer: B. M. fortuitum–chelonae complex

9/ A **child** presents with **unilateral cervical adenitis** following a recent tonsillar infection. The organism **enters through the oropharynx** and **infects draining lymph nodes**, producing a **yellow colony in both light and dark.** The organism is ?
A. M. avium
B. M. scrofulaceum
C. M. marinum
D. M. ulcerans
Answer: B. M. scrofulaceum

10/A 38 y.o patient presents with a **chronic lung infection** and painful swelling of the **knee joint**. Culture from the joint aspirate indicating a **fast-growing organism**. acquired from the **environment**. The organism causes **skin, bone, and joints infections** and is **highly antibiotic-resistant**. What's the organism ?
A. Mycobacterium kansasii
B. Mycobacterium abscessus
C. Mycobacterium marinum
D. Mycobacterium fortuitum–chelonae complex
Answer: B. Mycobacterium abscessus

Pharmacology



L1. Drug management in asthma

1/ A 25 y.o woman presents with acute wheezing after exercise. She uses inhaler that provides **rapid relief within minutes**. Which of the following is the mechanism of action of this drug ?
A. Blocks muscarinic receptors in airway smooth muscle
B. Directly activates β2 receptors → ↑ cAMP → smooth muscle relaxation
C. Inhibits phosphodiesterase → ↑ cAMP
D. Blocks leukotriene D4 receptors on airway smooth muscle
Answer: B. Directly activates β2 receptors → ↑ cAMP → smooth muscle relaxation *(Albuterol)*

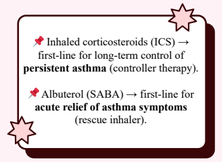
2/ Which anticholinergic drug provides once-daily bronchodilation lasting 18–24 hours ?
A. Ipratropium
B. Tiotropium
C. Salmeterol
D. Montelukast
Answer: B. Tiotropium

3/ A 15 y.o asthmatic boy presents with worsening wheeze after using his inhaler every hour. ECG shows **tachycardia** and labs reveal **hypokalemia**. Which drug interaction most likely worsened his condition ?
A. Beclomethasone + Theophylline
B. Zileuton + Aminophylline
C. Salbutamol + Theophylline
D. Ipratropium + Aminophylline
Answer: C. Salbutamol + Theophylline

4/ Which of the following is a serious toxicity associated with theophylline overdose ?
A. Hypertension
B. Seizures and arrhythmias
C. Cushing's syndrome
D. Oral candidiasis
Answer: B. Seizures and arrhythmias

5/ A 35 y.o asthmatic patient is on theophylline and atenolol. He presents with worsening shortness of breath. Which drug interaction most likely contributed ?
A. Atenolol increases seizure threshold
B. Theophylline neutralizes β-blocker effects
C. Atenolol increases bronchospasm risk with theophylline
D. Atenolol increases theophylline clearance
Answer: C. Atenolol increases bronchospasm risk with theophylline

6/ Which of the following is considered the first-line controller medication for **persistent asthma** ?
A. Short-acting β2 agonists
B. Anticholinergics
C. Inhaled corticosteroids
D. PDE inhibitors
Answer: C. Inhaled corticosteroids



7/ Theophylline has a narrow therapeutic index, with safe serum levels of ?
A. 1–5 mg/L
B. 50–100 mg/L
C. 10–20 mg/L
D. 25–40 mg/L
Answer: C. 10–20 mg/L

8/ A 42 y.o woman with **severe refractory** allergic **asthma** is considered for **omalizumab** therapy. Which of the following best describes its mechanism of action ?
A. Anti-IgE
B. Anti-IL-5
C. Anti-IL-13
D. Anti-IL-4
Answer: A. Anti-IgE

9/ Which of the following adverse effects has been reported with LTRA therapy ?
A. Seizures
B. Hypokalemia
C. Oral candidiasis
D. Neuropsychiatric symptoms (e.g., mood changes, nightmares)
Answer: D. Neuropsychiatric symptoms (e.g., mood changes, nightmares)

10/ Which lab test should be monitored in patients taking zileuton ?
A. Serum potassium
B. Liver function tests
C. Thyroid function tests
D. Serum calcium
Answer: B. Liver function tests

L1. Drug management in asthma past questions

1/ Which of the following drugs has a narrow therapeutic index ?
A. Montelukast
B. Tiotropium
C. Theophylline
D. Salmeterol

2/ What is the first line treatment for a 10 year old child with asthma ?
A. Theophylline
B. Tiotropium
C. Montelukast
D. Inhaled albuterol

3/ What is the mechanism of action of albuterol ?
A. Competitive inhibition of M3-cholinergic receptors
B. Stimulate adenylyl cyclase enzyme
C. Interfere with leukotriene D4 (LTD4)
D. Activate intercellular glucocorticoid receptor

4/ Which of the following is an anti-inflammatory drug used in the treatment of asthma ?
A. Anticholinergics
B. B2 adrenoreceptor agonists
C. Corticosteroids
D. Phosphodiesterase inhibitors

5/ A 10 year-old with poorly controlled asthma presents with wheezing, shortness of breath, and cough. What is the best medication for anti-inflammatory effect ?
A. Salmeterol
B. Tiotropium
C. Theophylline
D. Inhaled corticosteroids

6/ A patient with wheezing, shortness of breath for 4 months, a history of smoking, and eczema is prescribed a SABA (Short-Acting Beta-Agonist). What is a common side effect of this medication ?
A. Hypocalcemia
B. Hyperkalemia
C. Hypokalemia
D. Weight gain

7/ A patient with newly diagnosed asthma presents with acute wheezing and shortness of breath. What is the next proper step in managing this patient ?
A. Albuterol
B. Inhaled corticosteroids
C. Tiotropium
D. Montelukast

8/ Which of the following drugs is commonly combined with SABA for the treatment of not well controlled asthma ?
A. Leukotriene receptor antagonist (LTRA)
B. Phosphodiesterase inhibitors
C. Low dose inhaled corticosteroid (ICS)
D. B2 adrenoreceptor agonists

9/ Which of the following is an adverse effect of salmeterol ?
A. Adrenal suppression
B. Tachycardia
C. Hyperkalemia
D. Anaphylaxis

10/ Which of the following best explains the therapeutic role of ipratropium in the management of COPD ?
A. Direct stimulation of β2-adrenergic receptors
B. Anti-inflammatory action
C. Decreases bronchial secretions
D. Inhibit arachidonic acid pathway

L1. Drug management in asthma past questions

11/ Corticosteroid therapy is associated with which of the following common side effects ?
A. GI upset
B. Hypokalemia
C. Oral candidiasis
D. Toxicity

12/ Which of the following medications is the most used to treat beta blocker induced bronchospasm ?
A. Albuterol
B. Ipratropium
C. Corticosteroids
D. Montelukast

L2. Anti-thrombotic drugs

1/ Most common serious adverse effect of long-term aspirin therapy ?
A. Hepatotoxicity
B. Gastrointestinal bleeding
C. Thrombocytopenia
D. Renal stones
Answer: B. Gastrointestinal bleeding

2/ Which drug reduces the efficacy of clopidogrel by inhibiting its activation ?
A. Omeprazole
B. Atenolol
C. Amiodarone
D. Candesartan
Answer: A. Omeprazole

3/ A 62 y.o man with unstable angina is scheduled for PCI. He receives an IV drug that prevents platelet aggregation by blocking fibrinogen binding. Hours later, his platelet count drops drastically, and he develops bleeding. Which drug was most likely administered ?
A. Aspirin
B. Clopidogrel
C. Abciximab
D. Dipyridamole
Answer: C. Abciximab

4/ Concomitant use of aspirin with warfarin increases the risk of ?
A. Renal failure
B. Hyperkalemia
C. Severe bleeding
D. Thrombocytosis
Answer: C. Severe bleeding

5/ A 68 y.o man develops **painful, purple skin necrosis** a few days after starting warfarin. Which mechanism explains this complication ?
A. Direct platelet receptor blockade
B. Rapid reduction in protein C levels compared to clotting factors
C. Reduced platelet serotonin release
D. Increased fibrinolysis
Answer: B. Rapid reduction in protein C levels compared to clotting factors

6/ A 72 y.o man with acute DVT is started on heparin. Hours later, he begins bleeding profusely. Which of the following is the most appropriate antidote ?
A. Vitamin K
B. Idarucizumab
C. Protamine sulfate
D. Fresh frozen plasma
Answer: C. Protamine sulfate

7/ Which antidote is used to reverse dabigatran in severe bleeding ?
A. Vitamin K
B. Protamine sulfate
C. Idarucizumab
D. Fresh frozen plasma
Answer: C. Idarucizumab

8/ Which drug is a monoclonal antibody that prevents fibrinogen from binding to activated platelets ?
A. Clopidogrel
B. Aspirin
C. Abciximab
D. Dipyridamole
Answer: C. Abciximab

9/ Which lab finding is expected in a patient on dabigatran ?
A. Prolonged thrombin time (TT)
B. Prolonged PT/INR
C. Prolonged aPTT only
D. Normal TT
Answer: A. Prolonged thrombin time (TT)

10/ A 54 y.o man takes aspirin daily after an MI. Which of the following coagulation tests is expected to remain normal ?
A. PT
B. aPTT
C. TT
D. Bleeding time
Answer: A, B, C (all remain normal) → Only bleeding time ↑

L2. Anti-thrombotic drugs past questions

1/ Which of the following is the mechanism of action of Dipyridamole ?
A. Selective PDE inhibitor
B. Non-selective PDE inhibitor
C. Inhibit Cox1
D. Factor Xa inhibitor

2/ Which of the following is the emergency antidote for warfarin toxicity ?
A. Protamine sulphate
B. Fresh frozen plasma
C. Clopidogrel
D. Aspirin

3/ A patient on Warfarin has severe bleeding. What can be used to reverse this effect ?
A. Heparin
B. Fresh frozen plasma
C. Protamine sulphate
D. Dabigatran

4/ What is the mechanism of action of unfractionated heparin (UFH) ?
A. Irreversibly modifies P2Y12
B. Block glycoprotein IIb/IIIa
C. Activation of Anti-thrombin III
D. Factor Xa inhibitor

5/ Which of the following inhibits hepatic vitamin K epoxide reductase ?
A. Heparin
B. Apixaban
C. Aspirin
D. Warfarin

6/ What is the antidote for heparin?
A. Fresh frozen plasma
B. Protamine sulfate
C. Vitamin K
D. Activated charcoal

7/ What is the antidote for warfarin overdose or toxicity ?
A. Heparin
B. Protamine sulfate
C. Direct and fast = FFP and Prothrombin complex concentrate
D. Aspirin

8/ Which of the following is an antidote for dabigatran ?
A. Fresh Frozen Plasma (FFP)
B. Vitamin K
C. Protamine sulfate
D. Idarucizumab

9/ A 45 year-old woman on hemodialysis was prescribed unfractionated heparin. What's the mechanism of action of this drug ?
A. Inhibition of Vitamin K epoxide reductase
B. Inhibition of platelet aggregation
C. Activation of Antithrombin III
D. Inhibition of Factor Xa

10/ A patient is prescribed an oral anticoagulant that prolongs thrombin time. What's the drug prescribed ?
A. Abciximab
B. Enoxaparin
C. Selective phosphodiesterase inhibitor
D. Direct thrombin (II) inhibitor (dabigatran)

L2. Anti-thrombotic drugs past questions

11/ Which anticoagulant requires monitoring of PT/INR ?
A. Apixaban
B. Heparin
C. Warfarin
D. Dabigatran

12/ Which anticoagulant may require monitoring for prolonged PT and PTT for laboratory diagnosis ?
A. Apixaban
B. Aspirin
C. Warfarin
D. Heparin

13/ Which anticoagulant requires monitoring of PTT (Partial Thromboplastin Time) ?
A. Apixaban
B. Dabigatran
C. Warfarin
D. UF Heparin

14/ Which of the following requires monitoring of prolonged thrombin time (TT) during treatment ?
A. Heparin
B. Warfarin
C. Aspirin
D. Dabigatran

15/ Which of the following test is used for monitoring the therapeutic effect of unfractioned heparin ?
A. PT
B. INR
C. Bleeding time
D. aPTT

16/ Which of the following is the most common adverse effect of aspirin ?
A. GIT bleeding
B. Osteoporosis
C. Skin necrosis
D. Acute thrombocytopenia

L3. Anti-tuberculous drugs

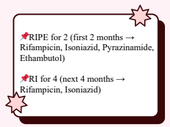
1/ A patient receiving rifampicin for TB notices **red-orange urine and tears**. What is the most likely mechanism of action of this drug ?
A. Inhibits mycolic acid synthesis
B. Inhibits DNA-dependent RNA polymerase
C. Inhibits DNA gyrase
D. Inhibits arabinosyl transferase
Answer: B. Inhibits DNA-dependent RNA polymerase (*Rifampin*)

2/ A 34 y.o man being treated for pulmonary tuberculosis presents with acute pain and **swelling of the big toe**. Laboratory tests reveal **elevated serum uric acid** levels (**gout**). Which anti-tuberculous drug is the most likely cause ?
A. Rifampicin
B. Isoniazid
C. Pyrazinamide
D. Ethambutol
Answer: C. Pyrazinamide

3/ Which first line anti-tuberculous drug is known to have poor penetration into the cerebrospinal fluid (CSF) ?
A. Isoniazid
B. Pyrazinamide
C. Rifampicin
D. Ethambutol
Answer: D. Ethambutol

4/ Which anti-tuberculous drug is a prodrug activated by the mycobacterial catalase–peroxidase (KatG) and acts by inhibiting mycolic acid synthesis in the bacterial cell wall ?
A. Rifampicin
B. Isoniazid
C. Ethambutol
D. Pyrazinamide
Answer: B. Isoniazid

5/ Which of the following combinations represents the initial phase (first 2 months) of standard anti-tuberculous therapy ?
A. Rifampicin + Isoniazid
B. Rifampicin + Isoniazid + Pyrazinamide + Ethambutol
C. Isoniazid + Ethambutol only
D. Rifampicin + Pyrazinamide + Streptomycin
Answer: B (RIPE: Rifampicin, Isoniazid, Pyrazinamide, Ethambutol)



6/ Resistance to rifampicin in mycobacterium tuberculosis is most commonly caused by mutations in which bacterial gene ?
A. KatG
B. InhA
C. DNA-dependent RNA polymerase
D. DNA gyrase
Answer: C. DNA-dependent RNA polymerase

7/ Which anti-tuberculous drug is a potent hepatic enzyme inducer, leading to increased metabolism of warfarin, phenytoin, and oral contraceptive pills ?
A. Isoniazid
B. Rifampicin
C. Ethambutol
D. Pyrazinamide
Answer: B. Rifampicin



8/ A 42 y.o man receiving second line anti-tuberculous therapy develops progressive hearing loss. He is also on treatment with loop diuretics. Which drug combination explains his worsened ototoxicity ?
A. Aminoglycoside + furosemide
B. Fluoroquinolones + furosemide
C. Rifampicin + bumetanide
D. Isoniazid + bumetanide
Answer: A. Aminoglycoside (*streptomycin*) + furosemide

9/ Resistance develops rapidly if which anti-tuberculous drug is used as monotherapy ?
A. Rifampicin
B. Isoniazid
C. Ethambutol
D. Pyrazinamide
Answer: C. Ethambutol

10/ A TB patient develops **tendinitis** while on therapy. Which second line drug is most likely the cause ?
A. Levofloxacin
B. Streptomycin
C. Rifampicin
D. Ethambutol
Answer: A. Levofloxacin

L3. Anti-tuberculous drugs past questions

1/ A 35 year-old male with pulmonary tuberculosis was prescribed a multidrug regimen as an induction phase. Now, he complains of a change in the color of his urine towards an orange-red color. The use of which of the following anti-tuberculosis drugs is associated with such a complaint ?
A. Pyrazinamide
B. Ethambutol
C. Rifampin
D. Isoniazid

2/ Which TB medication causes loss of sensation of the hands and feet ?
A. Rifampin
B. Pyrazinamide
C. Ethambutol
D. Isoniazid

3/ Which of the following is commonly given to high risk tuberculin reactors to prevent the development of tuberculosis (TB) ?
A. Rifampin
B. Ethambutol
C. Isoniazid
D. Pyrazinamide

4/ Which of the following TB medications causes diminished visual acuity (optic neuritis) ?
A. Isoniazid
B. Ethambutol
C. Rifampin
D. Pyrazinamide

5/ A patient receiving TB treatment develops **sideroblastic anemia** and **numbness**. What could prevent this ?
A. Should take vitamin B12
B. Should take vitamin B6
C. Should take vitamin C
D. Should take vitamin D

6/ Which TB medication acts better on intracellular mycobacteria ?
A. Streptomycin
B. Pyrazinamide
C. Levofloxacin
D. Amikacin

7/ Resistance to rifampin is primarily caused by ?
A. Mutation of KasA
B. Mutation InhA
C. RNA polymerase mutation
D. DNA polymerase mutation

8/ A 39 year-old patient comes to the physician for follow-up due to tingling of his hands after starting anti-tuberculosis therapy. What drug was most likely prescribed ?
A. Ethambutol
B. Rifampin
C. Isoniazid
D. Pyrazinamide

9/ What is the mechanism of action of rifampicin ?
A. Inhibit bacterial protein synthesis
B. Inhibit DNA-dependent RNA polymerase
C. Inhibits step in the biosynthesis of (mycolic acid)
D. Inhibit DNA gyrase

10/ Which of the following is the best explanation the mechanism of action of fluroquinolone ?
A. Inhibit DNA-dependent RNA polymerase
B. The MOA is unclear
C. Inhibit bacterial protein synthesis
D. Inhibit DNA gyrase

11/ A 42 year-old male on Isoniazid (INH) for latent tuberculosis presents with peripheral nephropathy, tingling, and sensory loss in the distal extremities. What is the most appropriate treatment to manage his condition ?
A. Prescribe painkillers for symptomatic relief
B. Vitamin B6 (pyridoxine) supplementation
C. Switch to a combination of Isoniazid and Rifampin
D. Increase the dose of Isoniazid

L4. Anti-hypertensive drugs

1/ A 52-year-old man with **long-standing hypertension** is started on a **new** medication. The drug acts **by inhibiting renin**, thereby **blocking the conversion of angiotensinogen to angiotensin I**. After 2 weeks of therapy, he presents with **mild diarrhea** and **elevated serum potassium levels**.
Which class of **antihypertensive drug** is this patient most likely taking?
A. Direct renin inhibitor (Aliski*ren*)
B. ACE inhibitor (Enala*pril*)
C. Angiotensin receptor blocker (Lo*sartan*)
D. Calcium channel blocker (Amlo*dipine*)
Answer: A, Direct renin inhibitor (Aliskiren)

2/ A 60-year-old man with a history of **myocardial infarction** is prescribed **Lisinopril**. This drug lowers his blood pressure by **decreasing peripheral vascular resistance**. His cardiologist explains that this medication improves survival by?
A. Increasing heart rate and cardiac output
B. Blocking β-adrenergic receptors in the heart
C. Attenuating ventricular remodeling (dilatation) after MI
D. Enhancing sodium and water retention
Answer: C, Attenuating ventricular remodeling (dilatation) after MI

3/ A 52-year-old woman with **hypertension** was started on Enalapril. After 4 months, she develops a persistent dry cough, which is attributed to increased bradykinin levels caused by the drug. Her physician switches her to **Losartan**, which successfully **lowers her blood pressure without recurrence of cough.** What is the **mechanism of action** of this new drug?
A. Inhibits renin, preventing conversion of angiotensinogen to angiotensin I
B. Inhibits ACE, blocking conversion of angiotensin I to angiotensin II
C. Blocks AT1 receptors, preventing angiotensin II–mediated vasoconstriction and aldosterone release
D. Increases bradykinin metabolism, reducing cough
Answer: C, Blocks AT1 receptors, preventing angiotensin II–mediated vasoconstriction and aldosterone release

4/ A 58-year-old man with **hypertension** and **diabetic nephropathy** is started on an ACE inhibitor (Enalapril). After several weeks, his blood pressure remains elevated. An intern suggests adding ARB (Losartan) to improve blood pressure control, but the attending physician **quickly rejects this idea**. Why should **ACE inhibitors and ARBs not be prescribed together**?
A. The combination causes severe hypotension in all patients
B. The combination increases bradykinin levels and worsens cough
C. The combination is ineffective because both drugs act at different sites in RAAS
D. The combination increases the risk of hyperkalemia and renal dysfunction
Answer: D, The combination increases the risk of hyperkalemia and renal dysfunction

5/ A 30-year-old woman develops a **persistent dry cough 3 months** after starting an antihypertensive medication. The cough is suspected to be due to **increased bradykinin**.
Which class of **antihypertensive** drugs is most likely responsible for this **side effect**?
A. Enalapril
B. Losartan
C. Amlodipine
D. Hydrochlorothiazide
Answer: A, Enalapril

6/ A 70-year-old woman is taking **Verapamil** for **arrhythmia**. She presents with **bradycardia**, **hypotension**, **constipation**, and **worsening heart failure**. Her physician warns that **adding certain drugs could further increase the risk of heart block**. Which drug interaction must be **avoided** in this patient to prevent severe cardiac depression and heart block?
A. Verapamil + ARBs
B. Verapamil + Statins
C. Verapamil + Beta-blockers
D. Verapamil + Thiazide diuretics
Answer: C, Verapamil + Beta-blockers

7/ A 62-year-old man with a history of **hypertension** and **angina** is prescribed a medication. Two months later, he reports **flushing, headache, and ankle swelling.** His physician reassures him that this class of drug is **unlikely to worsen heart failure**, since it **primarily acts on vascular smooth muscle rather than the myocardium.**Which class of **calcium channel blockers** does this medication belong to?
A. Dihydropyridines (Amlodipine, Nifedipine)
B. Non-dihydropyridines (Verapamil, Diltiazem)
C. Beta-blockers (Atenolol)
D. Alpha-blockers (Prazosin, Doxazosin)
Answer: A, Dihydropyridines (Amlodipine, Nifedipine)

8/ A 68-year-old woman with **hypertension** is prescribed a **calcium channel blocker**. After a few weeks, she develops **bradycardia**, **hypotension**, and **constipation**. Her physician explains that this drug is **highly negatively inotropic** and should **not be used in patients with heart failure**.
Which **calcium channel blocker** is being described?
A. Verapamil *(Highly negatively inotropic)*
B. Diltiazem *(Less negatively inotropic)*
C. Amlodipine *(mainly acts on vascular smooth muscle)*
D. Nifedipine *(mainly acts on vascular smooth muscle)*
Answer: A, Verapamil; highly negatively inotropic

L4. Anti-hypertensive drugs

9/ A 60-year-old man with newly diagnosed **hypertension** is prescribed a medication. His physician explains that this drug may **take 1–3 weeks to achieve a stable reduction in blood pressure**. Because it is **given once daily**, **patient compliance is usually good.** Which of the following medications was most likely prescribed?

A. Bendroflumethiazide (Thiazide Diuretics)
B. Spironolactone (Potassium-Sparing Diuretics)
C. Amiloride (Potassium-Sparing Diuretics)
D. Furosemide (Loop Diuretics)

Answer: A, Bendroflumethiazide (Thiazide Diuretics)

10/ A 58-year-old man with **resistant hypertension** is started on a new medication. After several months, his **blood pressure improves**, but he develops **gynecomastia** and **mild breast tenderness**. Which medication is most likely responsible for these effects?

A. Bendroflumethiazide (Thiazide Diuretics)
B. Spironolactone (Potassium-Sparing Diuretics)
C. Amiloride (Potassium-Sparing Diuretics)
D. Furosemide (Loop Diuretics)

Answer: B, Spironolactone (Potassium-Sparing Diuretics)

11/ A 62-year-old man with **hypertension** and **ischemic heart disease** is prescribed a **beta blocker**. During follow-up, he reports **nightmares**, and on examination he has **bradycardia** and mild wheezing. His physician **warns him not to suddenly stop the medication**.
What is the most likely **consequence of sudden withdrawal** of this drug in this patient?

A. Pulmonary edema
B. Severe hypoglycemia
C. Acute renal failure
D. Angina and myocardial infarction

Answer: D, Angina and myocardial infarction

12/ A 45-year-old man with **hypertension** due to **pheochromocytoma** is prescribed a medication that works by **blocking α1-adrenergic receptors**, leading to **blood pressure reduction**.
Which drug is most likely prescribed?

A. Prazosin
B. Propranolol
C. Amiloride
D. Hydrochlorothiazide

Answer: A, Prazosin

13/ A 58-year-old man with essential hypertension has been on combination antihypertensive therapy for several months, but his blood pressure remains poorly controlled. On review, his physician finds no evidence of secondary hypertension or no drug interactions. Further discussion reveals that the patient frequently forgets to take his medications. What is the most common reason for failure of antihypertensive therapy?

A. Lack of patient compliance
B. Drug–drug interactions
C. Inadequate drug absorption
D. Genetic resistance to antihypertensive agents

Answer: A, Lack of patient compliance

14/ A **45-year-old** man with **type 2 diabetes mellitus** presents with persistently **elevated blood pressure** despite lifestyle modification. He has no other comorbidities. According to the **current hypertension management guidelines**,What is the most appropriate **first-line treatment** for this patient?

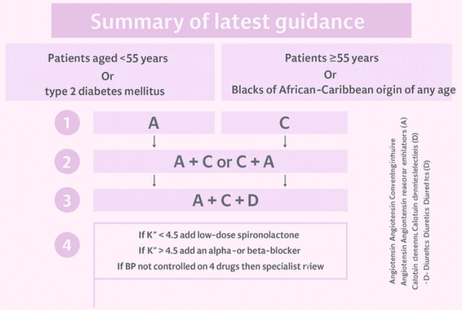
A. ACE inhibitor or ARB
B. Calcium channel blocker
C. Thiazide-like diuretic
D. Beta-blocker

Answer: A, ACE inhibitor or ARB

15/ A **62-year-old** woman of **African-Caribbean origin** is newly diagnosed with primary **hypertension**. She has **no** history of diabetes or kidney disease. According to the **latest hypertension management** guidance, Which **antihypertensive drug** class should be started **first**?

A. ACE inhibitor or ARB
B. Calcium channel blocker
C. Thiazide-like diuretic
D. Beta-blocker

Answer: B, Calcium channel blocker



L4. Anti-hypertensive drugs past questions

1/ What is the first-line treatment for a 59 year-old African man with hypertension ?
A. Angiotensin-converting enzyme inhibitors (ACE inhibitors)
B. Beta-blockers
C. Calcium channel blockers
D. Hydralazine

2/ What is the proper anti-hypertensive drug that a pregnant woman must stop taking ?
A. ACE inhibitors
B. Methyldopa
C. Hydralazine
D. Labetalol

3/ A patient with hypertension is treated initially with a thiazide diuretic. Later, another antihypertensive drug is added, but the patient develops erectile dysfunction and sleep disturbances (nightmares).
Which is the most likely 2nd drug ?
A. Diuretics
B. ARBs
C. Beta-blockers
D. Calcium channel blockers

4/ What is the proper cause of a persistent dry cough in a hypertensive patient on drug therapy ?
A. ACE inhibitors
B. ARBs
C. Beta-blockers
D. Calcium channel blockers

5/ Which antihypertensive drugs is most commonly associated with ankle and leg swelling (peripheral edema) ?
A. ARBs
B. Beta-blockers
C. Calcium channel blockers (CCBs: Diltiazem, Amlodipine, Nifedipine)
D. ACE inhibitors

6/ Which antihypertensive drug commonly causes dry persistent cough ?
A. Losartan
B. Amlodipine
C. Enalapril
D. Propranolol

7/ Which drug inhibits renin and prevents the conversion of angiotensinogen to angiotensin I ?
A. Spironolactone
B. Losartan
C. Aliskiren
D. Enalapril

8/ Which of the following antihypertensive drugs is most likely to cause hyperkalemia ?
A. Verapamil
B. Losartan
C. Furosemide
D. Hydrochlorothiazide

9/ Patient prescribed a drug that led to proliferation of breast tissue. What's this drug?
A. Spironolactone
B. Furosemide
C. Losartan
D. Amlodipine

10/ Which of the following is a common side effect of Captopril ?
A. Constipation
B. Ankle edema
C. Dry cough
D. Bradycardia

11/ An anti-hypertensive patient developed ankle swelling after starting treatment. Which drug is the cause?
A. Calcium channel blocker (Amlodipine)
B. ACE inhibitor (Enalapril)
C. Beta blocker (Metoprolol)
D. Thiazide diuretic (HCTZ)

L4. Anti-hypertensive drugs past questions

11/ Which calcium channel blocker has a long half-life and allows once-daily dosing ?
A. Nifedipine
B. Verapamil
C. Amlodipine
D. Diltiazem

12/ A 67 year-old patient presented with severe chest pain and dyspnea. ECG revealed changes of underlying ischemia. His blood pressure was 160/105. Which of the following anti-anginal drugs can be used for this condition ?
A. Hydralazine
B. Atenolol
C. Frusemide
D. Losartan

L5. Drug managementin ischemic heart diseases

1/ The primary effect of calcium channel blockers on blood vessels is ?
A.Vasoconstriction
B. Vasodilation
C. Increased preload
D. Decrease preload
Answer: B. Vasodilation (↓ **afterload**)

2/ A 60 y.o man with chronic stable angina asks about long-term medications to reduce future cardiac risk. He has no history of bleeding disorders. Which combination should be started ?
A. β-blocker and nitrate
B. Aspirin and statin
C. Verapamil and nicorandil
Answer: B. Aspirin and statin

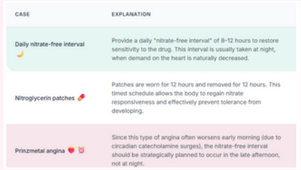
3/ A 58 y.o man with chest pain is given a **thrombolytic** drug in the **emergency** room. The drug acts by **converting plasminogen into plasmin**, which **breaks down fibrin**. Which of the following drugs was administered ?
A. Warfarin
B. Streptokinase
C. Heparin
D. Clopidogrel
Answer: B. Streptokinase

4/ A 62 y.o man treated for angina reports severe **headache**, **facial flushing**, and painful **perianal ulcerations** after several weeks. Which drug is most likely responsible ?
A. Atenolol
B. Diltiazem
C. Nicorandil
D. Nitroglycerin
Answer: C. Nicorandil

5/ A 55 y.o patient with **angina swallows his nitroglycerin** tablet**s instead of placing them sublingually**. His chest pain persists. What is the cause of the treatment failure ?
A. Drug tolerance developed
B. Drug destroyed by first-pass metabolism in the liver
C. Poor drug absorption from the oral mucosa
D. Delayed gastric emptying
Answer: B. Drug destroyed by first-pass metabolism in the liver

6/ A patient with ischemic heart disease is placed on a medication that **protects cardiomyocytes from oxygen free radicals formed during ischemic episodes**, thereby **reducing chest pain**. Which drug class provides this effect ?
A. β-blockers
B. Nitrates
C. Calcium channel blockers
D. Thrombolytics
Answer: A. β-blockers

7/ A 48 y.o woman with known **Prinzmetal angina** uses long-acting **nitroglycerin** for symptom control.
She reports experiencing severe chest pain **early in the morning despite strict medication adherence**.
Which of the following changes is most appropriate to improve her symptom control ?
A. Continue the current schedule with nitrate-free interval at night
B. Shift the nitrate-free interval to the late afternoon
C. Extend the nitrate-free interval to 24 hours
D. Wear patches for 12h with a free interval of 12h
Answer: B. Shift the nitrate-free interval to the late afternoon



8/ A 50 y.o man presents with **chest pain during <u>exercise</u>**. He uses a small **tablet under his tongue** and the pain disappears in **2 minutes**. Which of the following is the mechanism of this drug ?
A. Blocks beta receptors
B. Blocks alpha receptors
C. Inhibits calcium influx
D. Increases NO leading to vasodilation
Answer: D. Increases NO leading to → *(vasodilation, anti-thrombotic)*

9/ After receiving a **thrombolytic agent**, a patient develops **fever, rash, and shortness of breath** consistent with a **hypersensitivity reaction.** Which complication might this patient also experience ?
A. Severe headache
B. Bradycardia
C. Intracranial hemorrhage
Answer: C. Intracranial hemorrhage

10/ A 63 y.o man with stable angina is already receiving a **β-blocker but develops severe fatigue and bradycardia**. He also **cannot tolerate calcium channel blockers** due to hypotension. Which of the following drugs is most appropriate to **add** for symptom relief ?
A. Verapamil
B. Nifedipine
C. Nicorandil
D. Atenolol
Answer: C. Nicorandil *(Potassium-channel activator)*

11/ A 58 y.o man with stable **angina** has been using medication for chest pain. He recently took **Viagra (sildenafil) for erectile dysfunction**. A few hours later, he **faints and collapses** due to a sudden drop in blood pressure. Which drug caused this interaction, and what's the complication?
A. Atenolol – Bradycardia
B. Verapamil – Heart block
C. Nitroglycerin – Severe hypotension
D. Digoxin – Arrhythmia
Answer: C. Nitroglycerin – Severe hypotension

12/ A patient with **vasospastic (Prinzmetal) angina** requires long-term therapy. Which class of drugs provides the most effective **first-line control** ?
A. Calcium channel blockers
B. β-blockers
Answer: A. Calcium channel blockers

L5. Drug managementin ischemic heart diseases past questions

1/ Which of the following describes the mechanism of action of ranolazine ?
A. Decrease intracellular c-AMP level
B. Beta1-blocker
C. Na-channel blocker
D. Ca-channel blocker

2/ What is a the most common side effect of nitrates ?
A. Anal ulceration
B. Bad taste
C. Flushing
D. Headache

3/ What is the preferred route of nitrate administration to avoid the hepatic first-pass effect ?
A. Intravenous administration
B. Sublingual administration
C. Intranasal administration
D. Oral administration

4/ Which of the following drugs can potentiate the action of nitrates and cause severe hypotension ?
A. Metoprolol
B. Theophylline
C. Sildenafil
D. Diapridamole

5/ What is the mechanism of action of dipyridamole ?
A. Nonselective PDE inhibitor
B. Selective PDE inhibitors
C. Inhibit ACE and decrease angiotensin II
D. Inhibit Na+ reabsorption

L6. Lipid lowering drugs

1/ A patient is prescribed an **initial pharmacologic therapy** that **lowers LDL by 30-41%** through **inhibition of hepatic cholesterol synthesis**. What's the mechanism of action of this drug ?
A. Inhibit absorption of dietary cholesterol
B. Inhibits HMG-CoA reductase
C. ↓ bile acid absorption and ↑ bile acid excretion
D. Activating PPAR alpha receptors
Answer: B. Inhibits HMG-CoA reductase *(statins)*

2/ A 60 y.o patient reports **abdominal bloating** and **nausea** after starting a new lipid-lowering drug. The medication has **unpleasant taste & texture**, and must be taken in **large quantities**. Patient admits to **poor compliance**. Which drug is most likely responsible ?
A. Cholestyramine
B. Ezetimibe
C. Fenofibrate
Answer: A. Cholestyramine

3/ A patient on **simvastatin** develops **severe muscle pain *(myopathy)*** after being prescribed an **antibiotic for pneumonia**. Which drug most likely caused this ?
A. Warfarin
B. Digoxin
C. Clarithromycin
Answer: C. Clarithromycin

4/ A 62 y.o man on **statin + ezetimibe** therapy **still has high LDL and low HDL** levels. Which drug could best improve his lipid profile ?
A. Fenofibrate
B. Niacin (vitamin B_3)
C. Ezetimibe (higher dose)
Answer: B. Niacin (vitamin B_3)

5/ Which lipid lowering drug is **absorbed completely from the GI tract**, **excreted unchanged in urine**, **lowers triglycerides**, and may cause **gallstones, dyspepsia** and **reddish-brown urine** ?
A. Niacin
B. Ezetimibe
C. Cholestyramine
D. Fenofibrate
Answer: D. Fenofibrate

6/ A patient develops severe myopathy while taking simvastatin. What is the best alternative lipid-lowering therapy to continue LDL reduction ?
A. Bile acid sequestrant
B. Fibrate
C. Ezetimibe monotherapy
Answer: C. Ezetimibe monotherapy

7/ A **63 y.o underweight diabetic woman** with **chronic kidney disease** develops **diffuse muscle tenderness** after starting **simvastatin**. Which factor likely contributed to her condition ?
A. Kidney impairment
B. Combination of advanced age, female sex, low BMI, diabetes, and renal impairment
Answer: B. Combination of advanced age, female sex, low BMI, diabetes, and renal impairment

8/ A patient started on niacin complains of **facial flushing and warmth** after every dose. What is the best management ?
A. Stop niacin immediately
B. Take NSAIDs 30 minutes before niacin
C. Increase the niacin dose
Answer: B (*NSAIDs {aspirin, ibuprofen} taken 30–60 minutes before niacin inhibits prostaglandin synthesis → reduces flushing*)

9/ Statins are contraindicated in in which of the following conditions ?
A. Pregnancy & Lactation
B. Muscle disorders
C. Alcoholics
D. Active liver disease
Answer: All the above

10/ A 65 y.o on **atorvastatin** begin therapy for atrial fibrillation. After 2 weeks, he develops bruising and **elevated INR**. Which drug addition caused the reaction ?
A. Clarithromycin
B. Warfarin
C. Aspirin
Answer: B. Warfarin

11/ Which drug **inhibits cholesterol absorption in the small intestine**, **decreases liver cholesterol stores**, and **lowers LDL** levels, especially when **combined with statins** ?
A. Niacin
B. Resins
C. Ezetimibe
D. Fenofibrate
Answer: C. Ezetimibe

12/ Patient with **gallstones history**, **hepatic dysfunction**, and **renal impairment**, which drug is contraindicated ?
A. Fenofibrate
B. Ezetimibe
C. Atorvastatin
Answer: A. Fenofibrate

13/ A 52 y.o patient with **hypertriglyceridemia** is prescribed a drug that binds to **PPAR-α receptors**. What's the drug ?
A. Ezetimibe
B. Pravastatin
C. Fenofibrate
D. Niacin
Answer: C. Fenofibrate

14/ A paitient presents with **swelling of the toe**, **elevated liver enzymes**, and **fasting glucose of 180 mg/dL** after starting a new lipid-lowering medication. Which of the following drugs responsible for these findings ?
A. Fenofibrate
B. Ezetimibe
C. Niacin (Vitamin B_3)
Answer: C. Niacin (Vitamin B_3) (*hyperuricemia, hepatotoxicity, and impaired glucose tolerance*)

15/ Ezetimibe is contraindicated with statins in patients who have ?
A. Active hepatic disease
B. Mild renal impairment
C. Hypothyroidism
Answer: A. Active hepatic disease

16/ A patient taking **cholestyramine, digoxin** and **vitamins** together develops reduced therapeutic response to digoxin & vitamins. What's he best management ?
A. Discontinue cholestyramine
B. Take other drugs 4–6 hours after cholestyramine
C. Take other drugs 1–2 hours before cholestyramine
Answer: B & C

17/ Which class of drugs is **second line for treating hyperlipidemia when triglycerides remain elevated** despite statin therapy ?
A. Resins
B. Fibrates
C. Niacin
D. Ezetimibe
Answer: B. Fibrates

18/ Which lipid-lowering drugs ↑ triglycerides while ↓ ↓ LDL?
A. Resins
B. Ezetimibe
C. Statins
Answer: A. Resins

	LDL	HDL	Triglyceride
Statins	↓↓↓	↑	↓
Fibrates	↑	↓	↓↓↓
Resins	↓↓	↑	↑
Niacin	↓↓	↑↑↑	↓
Ezetimibe	↓↓	↑/↔	↑/↔

L6. Lipid lowering drugs past questions

1/ What is the best time to take statin medication ?
A. Before exercise
B. In the morning
C. At night
D. With meals

2/ Which of the following may experience myalgia (muscle pain) or myopathy with the use of HMG-CoA reductase inhibitors ?
A. Patients with hypertension
B. Patients with gout history
C. Patients with renal insufficiency
D. Patients with family history of gallstone

3/ Which of the following drugs limits the production of free fatty acids ?
A. Fenofibrate
B. Niacin (Vitamin B3)
C. Pravastatin
D. Resins

4/ Which of the following drugs inhibits the absorption of dietary cholesterol ?
A. Simvastatin
B. Niacin
C. Cholestyramine
D. Ezetimibe

5/ What's the main mechanism of action of Simvastatin ?
A. Activation of PPAR alpha receptors
B. Reduce production of free fatty acids
C. Inhibition of HMG-CoA reductase
D. Increase bile acid excretion

6/ If a patient is taking vitamins and cholestyramine, when should the vitamins be taken to ensure proper absorption ?
A. 1 hour before cholestyramine
B. 30 minutes before cholestyramine
C. 2 hours after cholestyramine
D. With cholestyramine

7/ Which of the following anti-dyslipidemia drugs causes elevation of VLDL and triglycerides when used as monotherapy ?
A. Atorvastatin
B. Ezetimibe
C. Niacin
D. Cholestyramine

8/ What is the upper limit of hepatic enzyme levels permitted in a patient on statin therapy ?
A. 10 times normal
B. 5 times normal
C. 2 times normal
D. 3 times normal

9/ Which of the following medications is known to cause a bad taste/texture as a common side effect ?
A. Ezetimibe
B. Niacin
C. Cholestyramine
D. Simvastatin

10/ Which of the following is considered the first-line treatment for reducing LDL cholesterol ?
A. Niacin
B. Statins
C. Fibrates
D. Resins

L7. Drug management in heart failure

1/ A 70 y.o man with **chronic heart failure cannot tolerate BB or ACE inhibitors** due to persistent cough. Which combination of drugs would **improve his mortality** by providing **both arterial and venous dilation** ?
A. Hydralazine + Nitrates
B. Loop diuretic + Thiazide diuretic
C. Beta-blocker + Calcium channel blocker
Answer: A. Hydralazine + Nitrates

2/ A 65 y.o man with **heart failure** and **peripheral edema** develops **severe dyspnea due to pulmonary edema**. Which drug provides **rapid relief** and may cause **hearing loss if combined with gentamicin** ?
A. Hydrochlorothiazide
B. Spironolactone
C. Amiloride
D. Furosemide
Answer: D. Furosemide *(Loop DIs)*

3/ Which drugs are recommended as **first-line treatment** for all patients with chronic heart failure ?
A. ACE inhibitor and β-blocker
B. Loop diuretic and digoxin
C. Nitrates and hydralazine
Answer: A. ACE inhibitor and β-blocker

4/ Which adverse effect is specifically associated with **long-term, high-dose hydralazine** ?
A. Hypokalemia
B. Lupus-like syndrome
C. Gout
D. Hyperglycemia
Answer: B. Lupus-like syndrome

5/ Which of the following drug combinations best helps to **reduce preload *(unloading)*** in a heart failure patient with **increased blood volume and increased venous tone** ?
A. Arterial vasodilators
B. Diuretics and Venous vasodilators
C. Inotropic drugs
D. Beta-blockers
Answer: B. Diuretics and Venous vasodilators

6/ Which drug combination proved to **improve quality** of life and survival in **high-mortality** heart-failure patients ?
A. ACE inhibitors + Aldosterone antagonists
B. Diuretics + Beta-blockers
C. Inotropic drugs + Vasodilators
D. Nitrates + Calcium-channel blockers
Answer: A. ACE inhibitors + Aldosterone antagonists

HF Effects	Goal	Main Drugs Used
Increased preload due to: increased blood volume increased venous tone	Reduce preload (unloading)	Diuretics Vasodilator (venous)
Increased afterload due to: ncreased arterial constriction	Reduce afterload (unloading)	Vasodilator (arterial)
Decreased contractility due to: ventricular dilation	Increase contractility	Inotropic drug
Reflex tachycardia	Reduce energy spending	Beta blockers
Digiex tachychpradia	Improve mortality	Angiotensin-converting enzyme Inhibitors Aldosterone antagonists

7/ A 68 y.on man with **acute decompensated heart failure** is started on an **intravenous drug that increases cardiac contractility and decreases afterload by increasing intracellular cAMP levels**. After several days, he develops **ventricular arrhythmia and hypotension.** Which of the following drugs was given ?
A. Digoxin
B. Nitrates
C. Milrinone
Answer: C. Milrinone *(PDE-3 inhibitor)*

8/ Milrinone increases cardiac contractility and decreases afterload by ?
A. Inhibiting PDE3 → ↑ cAMP → ↑ Ca^{2+} in myocardium and ↓ MLCK activity in vessels
B. Blocking Na^+/K^+ ATPase
C. Stimulating β_1 receptors
D. Releasing NO
Answer: A. Inhibiting PDE3 → ↑ cAMP → ↑ Ca^{2+} in myocardium and ↓ MLCK activity in vessels

9/ In a heart failure patient whose **symptoms persist despite ACE inhibitor and β-blocker therapy**, which drug should be considered next ?
A. Thiazide
B. Hydralazine
C. Digoxin
Answer: C. Digoxin

10/ In patients with chronic HF, the major beneficial mechanism of β-blockers is ?
A. Increased myocardial contractility
B. Blocking chronic sympathetic activation and preventing cardiac remodeling
C. Increasing renin release
D. Increasing heart rate
Answer: B. Blocking chronic sympathetic activation and preventing cardiac remodeling *(Decrease remodeling, hypertrophy, and cell death)*

11/ Digoxin exerts its positive inotropic effect by ?
A. Inhibiting Na^+/K^+ ATPase → ↑ intracellular Ca^{2+}
B. Blocking PDE3
C. Increasing cAMP
D. Activating β_1 receptors
Answer: A. Inhibiting Na^+/K^+ ATPase → ↑ intracellular Ca^{2+}

12/ Which of the following drugs **decreases preload** ?
A. Nitrates
B. Hydralazine
C. ACE inhibitors
D. β-blockers
Answer: A. Nitrates

13/ Which of the following **must be monitored** in patients taking digoxin ?
A. Potassium
B. Calcium
C. Sodium
D. Glucose
Answer: A. Potassium (K^+)

14/ Which of the following represents **second-line** treatment for heart failure ?
A. Aldosterone antagonist, ARB, or Hydralazine + Nitrate
B. Calcium channel blocker, Thiazide, or Digoxin
C. Diuretic, PDE3 inhibitor, or Statin
D. ACE inhibitor, β-blocker, and ARB
Answer: A. Aldosterone antagonist, ARB, or Hydralazine + Nitrate

15/ A 72 y.o woman with **HF** develops **hyperkalemia** after adding **spironolactone to lisinopril**. What is the mechanism for this complication ?
A. Increased Na^+ reabsorption
B. Reduced K^+ secretion in collecting duct
C. Enhanced aldosterone release
D. Increased distal K^+ exchange
Answer: B. Reduced K^+ secretion in collecting duct
(Both ACEI & aldosterone blockade ↓ aldosterone activity → ↓ K^+ excretion → hyperkalemia)

16/ In patients with **chronic heart failure,** which of the following β-blockers have shown the **most promising results in improving survival and reducing cardiac remodeling** ?
A. Bisoprolol
B. Carvedilol
C. Metoprolol
Answer: All the above

17/ Which drug provides symptomatic relief **<u>without</u> improving mortality** ?
A. Digoxin
B. ACE inhibitor
C. Beta-blocker
D. Spironolactone
Answer: A. Digoxin

18/ A 65 y.o man with **chronic HF** is started on a **vasodilator**. The drug **increases cGMP and relaxes both veins and arteries**. Which drug is it ?
A. Hydralazine
B. Sodium Nitroprusside
C. Nitrates
D. ACE inhibitor
Answer: B. Sodium Nitroprusside

Drug	Mechanism	Vessels affected
Nitrates	Direct: produce nitric oxide (NO) release, increase cGMP	Venous
Hydralazine	Inhibiting accumulation of intracellular free Ca2+	Arteriolar
Na nitroprusside	Direct: produce NO, increase cGMP	Arteriolar and venous
ACEIs	Inhibit ACE and decrease angiotensin II	Arteriolar and venous

L7. Drug management in heart failure past questions

1/ Which ion should be closely monitored in patients taking Digoxin ?
A. Calcium
B. Sodium
C. Potassium
D. Chloride

2/ Sudden withdrawal of which drug may induce angina, myocardial infarction ?
A. Thiazide like diuretics
B. Beta-blockers
C. Loop diuretics
D. Thiazide diuretics

3/ What is the mechanism of action of beta-blockers in heart failure ?
A. Decrease preload
B. Increase preload
C. Increase myocardial contractility
D. Decrease cardiac remodeling

4// A 67 year-old patient presented with severe chest pain and dyspnea. ECG revealed changes of underlying myocardial ischemia. His blood pressure was 160/105. Which of the following anti-anginal drugs can be used for controlling this patient's condition ?
A. Losartan
B. Hydralazine
C. Atenolol
D. Furosemide

5/ Which of the following medications is most commonly associated with a lupus like syndrome as a side effect ?
A. Nitrates
B. Beta-blocker
C. Hydralazine
D. Diuretics

L8. Anti-arrhythmic drugs

1/ Which drug class slows phase 0 depolarization most strongly ?
A. IA
B. IC
C. IB
D. II
Answer: B. IC

CLASSIFICATION OF DRUG	MECHANISM OF ACTION	COMMENT
IA	Na^+ channel blocker	Slows Phase 0 depolarization in ventricular muscle fibers
IB	Na^+ channel blocker	Shortens Phase 3 repolarization in ventricular muscle fibers
IC	Na^+ channel blocker	Markedly slows Phase 0 depolarization in ventricular muscle fibers
II	β-Adrenoreceptor blocker	Inhibits Phase 4 depolarizatoon in SA and AV nodes
III	K^+ channel blocker	Prolongs Phase 3 repolarization in ventricular muscle fibers
IV	Ca^{2+} channel blocker	Inhibits action potential in SA and AV nodes

2/ A patient on **Digoxin** presents with **yellow vision and bradycardia**. Which drug **reverses the bradycardia** ?
A. Atropine
B. Verapamil
C. Propranolol
D. Amiodarone
Answer: A. Atropine

3/ A patient receiving an **IV anti-arrhythmic** drug for **post-myocardial infarction ventricular arrhythmia** develops **confusion, seizures, and AV conduction block**.
Which of the following drugs is responsible ?
A. Quinidine
B. Lidocaine
C. Amiodarone
D. Verapamil
Answer: B. Lidocaine

4/ A patient receiving **Quinidine** develops **prolonged QT interval** and **syncope**. The most likely cause is ?
A. AV block
B. Torsades de pointes
C. Hyperkalemia
D. Sinus bradycardia
Answer: B. Torsades de pointes

5/ Which anti-arrhythmic drug has the **longest half-life** and **accumulates in adipose tissue** ?
A. Amiodarone (20–100 days)
B. Flecainide
Answer: A. Amiodarone *(20–100 days)*

6/ A 58 y.o old man with chronic **atrial fibrillation** has been on **long-term therapy with an anti-arrhythmic** drug that **prolongs the QT interval**. Recently, he develops progressive dyspnea. Physical examination reveals **blue-gray skin discoloration** on sun-exposed areas *(photosensitivity)*. Thyroid profile demonstrates **hypothyroidism**.
Which of the following drugs is these findings?
A. Quinidine
B. Verapamil
C. Amiodarone
Answer: C. Amiodarone

7/ A patient being treated for **supraventricular tachycardia** develops **bradycardia**, **oral paresthesia**, and **visual disturbances**. His ECG shows a **prolonged QRS complex.** Which of the following drugs is most likely responsible ?
A. Lidocaine
B. Quinidine
C. Flecainide
D. Amiodarone
Answer: C. Flecainide

8/ Digoxin reduces conduction velocity and heart rate by ?
A. Stimulating β_1-receptors
B. Blocking Na^+ channels
C. Depressing AV and SA nodes (negative dromotropic & chronotropic effects)
Answer: C. Depressing AV and SA nodes (negative dromotropic & chronotropic effects)

9/ Which drug combination **increases Digoxin levels, requiring dose reduction** ?
A. Amiodarone or Verapamil
B. Lidocaine + Sotalol
C. Propranolol + Atropine
D. Quinidine + Furosemide
Answer: A. Amiodarone or Verapamil

10/ A patient with **paroxysmal supraventricular tachycardia (PSVT)** is started on an anti-arrhythmic drug that acts by **slowing AV nodal conduction**.
ECG shows a **prolonged PR interval**. Which of the following drugs was given ?
A. Amiodarone
B. Verapamil
C. Metoprolol
D. Lidocaine
Answer: C. Metoprolol

11/ Which **Class I** anti-arrhythmic drug has the **highest risk** of precipitating **heart failure due to negative inotropy** ?
A. Flecainide
B. Lidocaine
C. Quinidine
D. Verapamil
Answer: A. Flecainide

12/ Which of the following shows **negative inotropic, chronotropic, and dromotropic** effects ?
A. Verapamil
B. Sotalol
C. Quinidine
Answer: A. Verapamil

13/ Which of the following best explains the **positive inotropic action of Digoxin** ?
A. Inhibition of Na^+/K^+-ATPase → ↑ intracellular Ca^{2+} concentration
B. Activation of β_1-receptors → ↑ cAMP
C. Blockade of K^+ channels → delayed repolarization
D. Blockade of Ca^{2+} channels → ↓ contractility
Answer: A. Inhibition of Na^+/K^+-ATPase → ↑ intracellular Ca^{2+} concentration

14/ A patient develops **ventricular arrhythmia following a myocardial infarction**. He is treated with an **anti-arrhythmic drug** that is **given intravenously due to extensive first-pass metabolism** and has a **short half-life of about (~100 min)**.
Which drug is this?
A. Quinidine
B. Lidocaine
C. Flecainide
Answer: B. Lidocaine

15/ Which of the following drugs has a **very long half life** and should be infused **via central veins** due to **risk of thrombophlebitis** ?
A. Amiodarone
B. Lidocaine
C. Quinidine
D. Verapamil
Answer: A. Amiodarone

16/ A patient develops **blurred vision, tinnitus, and prolonged QT interval** after taking an anti-arrhythmic drug. Which drug is responsible ?
A. Flecainide
B. Lidocaine
C. Quinidine
D. Verapamil
Answer: C. Quinidine

17/ Which of the following anti-arrhythmic drugs **increases Digoxin** levels and may **precipitate toxicity** ?
A. Lidocaine
B. Metoprolol
C. Quinidine
D. Verapamil
Answer: C. Quinidine

18/ Which of the following anti-arrhythmic drugs has a **narrow therapeutic index**?
A. Amiodarone
B. Lidocaine
C. Digoxin
D. Verapamil
Answer: C. Digoxin

L8. Anti-arrhythmic drugs past questions

1/ A 65 year-old patient on a rhythm control medication for ventricular tachyarrhythmia for the past one year presented at the pulmonology clinic with chest tightness and dyspnea. Pulmonary function tests revealed an underlying lung fibrosis. Which of the following drugs is responsible for this condition ?
A. Amiodarone
B. Flecainide
C. Lidocaine
D. Procainamide

2/ A 65-year-old lady was admitted to the emergency department with prolonged QT interval. She gave a history of taking double the dose of her rhythm control medication that has a very long half life accidentally. Which of the following drugs is responsible for her ECG changes ?
A. Verapamil
B. Amiodarone
C. Flecainide
D. Procainamide

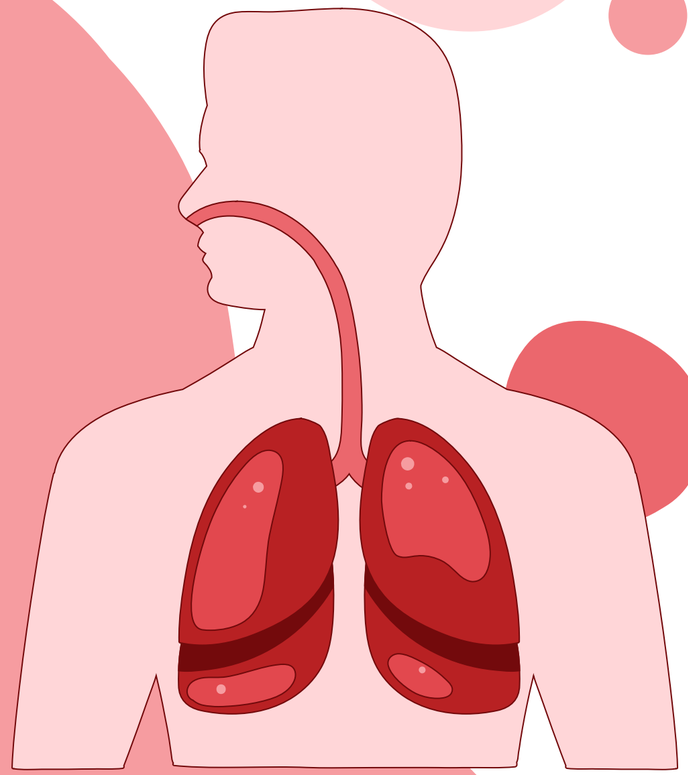
3/ A 67 year-old patient presented with severe chest pain and dyspnea. ECG revealed changes of underlying ischemia. His blood pressure was 160/105. Which of the following anti-anginal drugs can be used for this condition ?
A. Hydralazine
B. Atenolol
C. Frusemide
D. Losartan

4/ Which of the following is a known side effect of digoxin ?
A. Prolong QRS complex
B. QT prolongation
C. Short QT intervals
D. Prolonged PR intervals

5/ Which of the following manifestations of digitalis toxicity is reversed by atropine ?
A. Increased atrial contractility
B. Prolongation of PR interval
C. Tachycardia
D. Yellow-green vision

6/ Which of the following medications has a very long half-life ?
A. Flecainide
B. Lisinopril
C. Amiodarone
D. Digoxin

7/ Which of the following is a common side effect of digoxin ?
A. Tachycardia
B. Hyperglycemia
C. Hyperkalemia
D. Hypokalemia



GOOD LUCK!