

Directions: Questions (1-23) Circle the one best answer

C 1

A 55-year-old smoker presents with history of non-productive cough and exertional dyspnea for the last 3 months. The physical examination reveals fine bibasilar inspiratory crackles and clubbing.

Chest x-ray: Bilateral reticular opacities in the both lower lung fields

Blood gases: PO₂ 55 mm Hg, PCO₂ 40 mm Hg and pH 7.42

Laboratory tests: Hb 10gm/dL, HCT 30%, WBC 5000/uL, sedimentation rate 40 mm/h, ANA positive and RF is positive

CT scan chest: Patchy peripheral reticular opacities in the lower lobes with subpleural honeycombing

PFT'S: FVC 60% predicted, FEV1 62% predicted, FEV1/FVC 80%

The bronchoscopy with transbronchial biopsy is non-diagnostic

Based upon the above information the most likely diagnosis is:

(A) Lupus pneumonitis

(B) Interstitial lung disease secondary to Rheumatoid Arthritis

(C) Idiopathic pulmonary fibrosis

(D) Wegner's granulomatosis

D 2

A 40-year-old male presents with the history of progressively increasing dyspnea and cough for the last 6 months. The chest x-ray reveals butterfly pattern of opacities radiating from the hilum resembling pulmonary edema. The PFT's reveal a restrictive pattern and the PO₂ is 65 mm Hg. The bronchoalveolar lavage reveals PAS positive extracellular material and lipid-laden macrophages.

Based upon the above information, you will now start treatment with:

(A) High dose prednisone

(B) Prednisone plus cyclophosphamide

(C) Methotrexate

(D) Whole lung lavage by a double lumen endotracheal tube

Pulm. Alveolar Proteinosis

B 3

A 36 year-old smoker presents with non-productive cough and dyspnea, weight loss and low-grade fever for the last 3 months.

The chest x-ray reveals reticulonodular and interstitial infiltrates in the middle and upper lobes with multiple cystic areas. The PFT'S reveal mild restrictive pattern with reduction of CO diffusion. The CT scan reveals peribronchiolar nodular opacities with diffuse irregular shaped cystic spaces in the middle and upper lobes. The sputum smear for AFB is negative. On bronchoalveolar lavage 10% of cells stain positive with CD1A antigen

Based upon the above information, the most likely diagnosis is:

(A) Bronchiolitis obliterans organising pneumonia (BOOP)

(B) Pulmonary Langerhan's cell histiocytosis

(C) Idiopathic pulmonary fibrosis

(D) Pulmonary alveolar proteinosis

C 4.

A 40-year-old male is brought comatose to the emergency room. The examination reveals a BP of 80/50 and a pulse of 130/min. The EKG reveals sinus tachycardia. The laboratory studies reveal Na 140 meq/L, K 3.6 meq/L, Cl 92 meq/L, HCO₃ 15 meq/L, BUN 40 mg/dL and creatinine of 1.9 mg/dL. The blood gases reveal pH 6.9, PCO₂ 70 mm Hg, PO₂ 52 mm Hg.

The above findings are consistent with:

- (A) Metabolic acidosis
- (B) Metabolic acidosis + respiratory acidosis
- (C) Metabolic acidosis + respiratory acidosis + metabolic alkalosis
- (D) Respiratory acidosis

D 5.

A 46-year-old man comes to the hospital because of fever and progressively increasing shortness of breath of few days duration. Physical examination reveals temperature 101 F, RR 30/minute and diffuse rales in both lung fields. The chest x-ray shows bilateral pulmonary infiltrates and blood gases show PO₂ 42 mm, O₂ saturation 86 %, PCO₂ 34 mm and pH 7.45. He is admitted to ICU and started on broad-spectrum antibiotics and O₂. The repeat blood gases 2 hours later on FIO₂ of .7 (70 %) reveal PO₂ 48 mm, O₂ saturation of 88 %, PCO₂ 35 mm and pH 7.44.

Based upon the above information, you will now recommend:

- (A) Increase FIO₂ to 100 %
- (B) Start high dose intravenous corticosteroids
- (C) Start IV theophyllin and inhaled beta 2- agonist
- (D) Intubate and start mechanical ventilation

B 6.

A 19-year-old female is brought to emergency room in a comatose state. The laboratory studies reveal Na 138 meq/L, K 3.9 meq/L, Cl 103 meq/L, and HCO₃ 15 meq/L. The blood gases reveal pH 7.30, PCO₂ 15 mm Hg, PO₂ 76 mm Hg.

The above findings are consistent with:

- (A) Metabolic acidosis
- (B) Metabolic acidosis + respiratory alkalosis
- (C) Metabolic acidosis + respiratory alkalosis + metabolic alkalosis
- (D) Metabolic acidosis + respiratory acidosis

Dx: Salicylate Intoxication

D 7.

A 34-year-old man presents to the emergency room because of an acute asthmatic attack. He tried many puffs of albuterol spray at home but did not show any improvement. He has a history of asthma for many years and has been using inhaled beta 2 agonist prn. For the last 4 weeks, he has been using his inhaler 3-4 times/day for relief of asthmatic symptoms. Physical examination reveals RR 16/min., HR 90/minute and wheezing in both lungs. Blood gases: PO₂ 70 mm, PCO₂ 34 mm, pH 7.48, O₂ sat. 94 %

The PEFr is 60% of predicted. He is treated with inhaled beta 2-agonist delivered through a nebulizer. He shows marked improvement in his symptoms but slight wheezing persists.

For further management of this patient, you will now recommend :

- (A) Admit patient and start IV corticosteroid
- (B) Discharge patient on inhaled beta 2 agonist to be used regularly QID
- (C) Discharge patient on inhaled corticosteroid to be used daily + prn inhaled beta 2-agonist
- (D) Discharge patient on oral prednisone + inhaled corticosteroid + inhaled beta 2 agonist prn

C 8.

A 70-year-old woman consults you because of history of cough and weight loss of 3 months duration. Chest x-ray shows a RUL mass. CT scan reveals no enlargement of hilar or mediastinal nodes. The serum calcium is 13mg/dL. The bone scan is normal.

Select the correct statement about this patient :

- (A) The patient has non-resectable squamous cell carcinoma of lung
- (B) The patient has non-resectable small cell carcinoma of lung
- (C) The patient has most likely resectable squamous cell carcinoma of lung
- (D) The patient has non-resectable large cell carcinoma of lung

C 9.

A 54-year-old man with COPD is brought to the emergency room in acute respiratory distress. He shows no improvement with inhaled bronchodilator and is intubated because of worsening blood gases. Within minutes of starting mechanical ventilation, his BP drops from 160/ 80 to 80/60, heart rate increases from 90/minute to 130/minute and his neck veins are markedly distended. Based upon the above information, the most likely cause of hypotension in this patient is:

- (A) Cardiac tamponade
- (B) Pneumothorax
- (C) Hyperinflation of lungs (auto-peep)
- (D) Sepsis

D 10.

A 46-year-old man has been on assist-control ventilation for the last 48 hours for acute respiratory distress syndrome. His respirator settings are a tidal volume of 800 ml, a respiratory rate of 16/minute, FIO₂ of .70 and an inspiratory flow of 60-liters/ minute. Arterial blood gases reveal PO₂ 60 mm Hg, PCO₂ 38 mm Hg and pH of 7.41.

The best course of action now should be:

- (A) Increase the inspiratory flow rate to 100 liters/minute
- (B) Increase FIO₂ to .80
- (C) Continue the present respirator settings
- (D) Add a PEEP of 5-10 cm of water

D 11. A 32-year-old woman with long standing history of asthma is brought to emergency room in comatose state. The blood gas analysis on room air reveals a pO₂ 46 mm Hg, pCO₂ 80, pH 7.12 and HCO₃ of 26 meq/L. Based upon the above information, the most likely diagnosis is :
(A) Status asthmaticus
(B) Pulmonary embolism
(C) Adult respiratory distress syndrome
(D) Sedative drug overdose

D 12. A 56-year-old man is diagnosed to have idiopathic obstructive sleep apnea. He complains of weakness, fatigue, day time somnolence and leg edema. Thyroid functions are normal. Select the best initial therapy for this patient
(A) Tracheostomy
(B) Amitriptyline at night
(C) Uvulopalatopharyngoplasty
(D) Nasal continuous positive airway pressure

C 13. A 24-year-old man is admitted to the hospital with fever and a leukocyte count of 330/uL. He was diagnosed to have acute myelogenous leukemia 3 months ago and has been on chemotherapy. Blood cultures are done and he is started on ticarcillin and tobramycin. Chest x-ray is negative. He becomes afebrile in 2 days and blood cultures show no growth. Few days later he again spikes fever to 102 F and develops cough with hemoptysis. The repeat chest x-ray shows nodular infiltrates in the left lower lobe. The most likely pathogen responsible for the pulmonary infiltrates is:
(A) Pseudomonas aeruginosa
(B) Candida
(C) Aspergillus
(D) Nocardia

C 14. A 62-year-old woman with history of COPD consults you because of increasing shortness of breath on exertion, weakness and bilateral ankle edema. Physical examination reveals engorged neck veins and bilateral ++ pedal edema. The chest examination shows diminished breath sounds bilaterally with no wheezing. She has been on inhaled bronchodilator and oral theophyllin for the last one year. Laboratory studies:
CBC..... Hb 18.5 g/dL, HCT 58%, WBC 6700/uL
Chest x-ray.....Hyperinflation with no parenchymal infiltrates or congestion
Blood gases.....PO₂ 56 mm Hg, PCO₂ 44 mm Hg, HCO₃ 29 meq /L
Theophyllin level.....13 ug/mL
Based upon the above information, you should now recommend :
(A) Digoxin and diuretics
(B) Phelobotomy to reduce HCT to < 50%
(C) Low flow oxygen for 24 hours a day
(D) Low flow oxygen for about 6 hours a day

B 15. A 22-year-old nonsmoking woman consults you because of chronic non-productive cough of 6 months duration. She denies any history of wheezing, nasal congestion or heartburn. Physical examination, chest x-ray and spirometry are normal. She shows no improvement with a trial of antihistamine and decongestant. Based upon the above information, you will now recommend:

- (A) A trial of systemic steroids
- (B) Methacholine challenge test
- (C) Upper GI series
- (D) Bronchoscopy

C 16. A 72-year-old man is admitted because of a hip fracture and undergoes hip replacement. Two days after surgery he develops fever, mental confusion, and severe shortness of breath. Physical examination reveals patient to be in marked respiratory distress, temp. 101 F, rales in both lung fields, petechial rash over chest and mental confusion. Chest x-ray shows diffuse pulmonary infiltrates. Blood gases reveals PO₂ 44 mm Hg, PCO₂ 30 mm Hg, pH 7.48. EKG shows sinus tachycardia. Patient is intubated and transferred to intensive care unit. Based upon the above information, the most likely diagnosis is :

- (A) ARDS due to sepsis
- (B) Acute cardiogenic pulmonary edema
- (C) Non cardiogenic pulmonary edema due to fat emboli
- (D) Aspiration pneumonia

D 17. A 26-year-old woman consults you because of fever and cough of 2 days duration. Physical examination reveals a temperature of 102 F and rales at both lung bases. Chest x-ray shows bilateral interstitial infiltrates. Sputum gram-stain shows many WBC's but no bacteria.

Based upon the above information, you should start therapy with :

- (A) Penicillin
- (B) Cefuroxime
- (C) Trimethoprim-sulfamethoxazole
- (D) Macrolide (Azithromycin or Clarithromycin)

C 18. A 57-year-old male smoker consults you because of cough and recurrent episodes of hemoptysis. Chest x-ray shows a 3 cm mass lesion in the right upper lobe. Serum calcium is 12.8 mg/dL. A chest CT scan shows the mass lesion and enlargement of right hilar nodes. Bronchoscopy and biopsy confirms the diagnosis of squamous cell carcinoma. Bone scan is normal. Pulmonary functions show mild obstructive features.

Based upon the above information, you will now recommend :

- (A) Radiation therapy
- (B) Chemotherapy
- (C) Surgical resection
- (D) Radiation followed by chemotherapy

A

19.

A 52-year-old man with history of mild CHF is admitted to the hospital because of sudden onset of shortness of breath and right-sided pleuritic chest pain. He has been on furosemide and digoxin. The examination reveals HR 110/minute, BP 120/80, and tenderness in the right calf area with edema of right leg and ankle. Chest x-ray shows cardiomegaly with mild congestive changes. Blood gases reveal PO₂ 75 mm Hg, PCO₂ 38 mm Hg and pH of 7.41. A ventilation/perfusion scan reveals multiple small subsegmental matched and unmatched defects.

Based on the above information, you will now recommend:

- (A) Evaluate for DVT by leg ultrasonography and start heparin
- (B) Pulmonary angiogram
- (C) Intravenous furosemide
- (D) Vena caval filter insertion

D

20.

A 67-year-old woman consults you because of weight loss, cough and proximal muscle weakness in the extremities. Muscle weakness is worse when she first begins to use her muscles and strength improves with continuous use. The chest x-ray shows a right hilar mass. Bronchoscopy and biopsy of the lesion is performed. The biopsy is most likely going to show:

- (A) Squamous cell carcinoma
- (B) Adenocarcinoma
- (C) Large cell carcinoma
- (D) Oat cell carcinoma

B

21.

A 69-year-old female is admitted to the hospital because of marked weakness and chronic non-productive cough. She has been on furosemide and digoxin for the treatment of mild CHF. Physical examination shows diminished breath sounds over left lung. Chest x-ray shows a large left hilar mass with partial collapse of left upper lobe.

Laboratory studies:

BUN..... 9 mg/dL
Cr..... 1.0 mg/dL
Na..... 118 meq/L
K.....3.6 meq/L
Uric acid.....3 mg/dL
Glucose.....120 mg/dL
Urine osmolality.....250 mosmol/Kg H₂O

Most likely cause of hyponatremia in this patient is :

- (A) Addison's disease caused by metastatic lung carcinoma to adrenal glands
- (B) Syndrome of inappropriate ADH caused by small cell carcinoma of the lung
- (C) Diuretic induced
- (D) SIADH caused by adenocarcinoma of the lung

C 22.

A 72-year-old man with long standing history of COPD presents to the emergency room with shortness of breath. Physical examination reveals wheezing in both lung fields. Blood gases show PO₂ 52 mm Hg, PCO₂ 48 mm Hg, pH 7.38 and HCO₃ 30 meq/L. He is treated with inhaled bronchodilator, intravenous steroids, aminophyllin and supplementary O₂ at a FIO₂ of .50. Repeat blood gases 2 hours later show PO₂ 100 mm Hg, PCO₂ 70 mm Hg and pH of 7.30
At this point, you would recommend

- (A) Intubate the patient and start on assist-control ventilation
- (B) Discontinue O₂ therapy
- (C) Slowly reduce concentration of O₂
- (D) Start intravenous antibiotics

D 23.

A 42-year-old woman presents with one-week history of fever, dyspnea, non productive cough pleuritic chest pain on left side. She underwent coronary bypass surgery about 6 weeks ago. Physical examination reveals rales at both lung bases and a pericardial friction rub. Laboratory tests show a Hb of 12.2 g/dL, HCT 38%, WBC 10500/uL and a sed. rate of 76 mm/h. Chest x-ray reveals cardiomegaly, infiltrates in both lungs and a small left pleural effusion. Arterial blood gases show a PO₂ of 80 mm Hg, PCO₂ 34 mm Hg and pH of 7.45. A thoracentesis is performed and 300 cc of fluid is removed. Examination of fluid shows protein of 4.0 g/dL and LDH of 350 units/mL. A ventilation perfusion scan shows few small subsegmental matched defects.

Based upon the above information, the most likely diagnosis is :

- (A) Pulmonary embolism
- (B) Pneumonia with parapneumonic effusion
- (C) Congestive heart failure
- (D) Dressler's syndrome

Directions: Items 24-50 are true and false questions. Mark T for statements that are correct and F for statements that are incorrect

24-27 A 26-year-old woman presents with 2 week history of fever, weakness, arthralgias affecting multiple joints and tenderness and redness over anterior aspect of both legs. Physical examination shows a temperature of 101 F and multiple raised erythematous tender nodules over both legs. Chest x-ray reveals bilateral hilar lymphadenopathy.

True statements about this patient include:

- T 24) A gallium 67 lung scan is likely to show increased uptake in the hilar nodes
- T 25) Bronchoalveolar lavage would reveal predominant lymphocytes
- T 26) Levels of angiotensin-converting enzyme are likely to be elevated
- F 27) She should be started immediately on systemic steroids and they should be continued for at least 6 months

28-30 Factors that decrease the clearance of theophylline include

- T (28) Cimetidine
- T (29) Erythromycin
- F (30) Smoking

31-35 True statements about allergic broncho-pulmonary aspergillosis include:

- T (31) It should be suspected in patients with bronchial asthma who present with recurrent pulmonary infiltrates
- T (32) Skin test shows a positive immediate response to *A. fumigatus*
- F (33) It should be treated with Amphotericin B
- T (34) Serum IGE levels are elevated and peripheral eosinophilia is usually present
- T (35) Sputum usually shows brownish plugs and culture is positive for *A. fumigatus*

36-40 Contraindication for surgery in lung cancer include :

- F (36) Presence of hypercalcemia
- T (37) Contralateral hilar or mediastinal nodal involvement
- T (38) SVC syndrome
- T (39) Pleural effusion with positive malignant cells
- T (40) Recurrent laryngeal nerve or phrenic nerve paralysis

41-45 Indications of steroid therapy in sarcoidosis include:

- T (41) Persistent hypercalcemia
- T (42) Progressive decrease in vital capacity
- T (43) Cardiac and CNS involvement
- T (44) Uveitis
- F (45) Pulmonary infiltrates with positive gallium scan

46-50 True statements about bronchiectasis include

- T (46) Pulmonary infection or colonization with *P. aeruginosa* is common
- T (47) Cystic fibrosis should be considered in children or young adults with bronchiectasis
- T (48) High resolution CT scan of the chest is the best way to confirm the diagnosis
- T (49) It may occur in patients with hypogammaglobulinemia
- T (50) Diagnosis of Cystic Fibrosis is confirmed by showing sweat chloride of > 60 meq/L or positive CFTR gene mutation analysis

Answers to Pulmonary Questions

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|-----|---|-----|---|
| 1. | C | 26. | T |
| 2. | D | 27. | F |
| 3. | B | 28. | T |
| 4. | C | 29. | T |
| 5. | D | 30. | F |
| 6. | B | 31. | T |
| 7. | D | 32. | T |
| 8. | C | 33. | F |
| 9. | C | 34. | T |
| 10. | D | 35. | T |
| 11. | D | 36. | F |
| 12. | D | 37. | T |
| 13. | C | 38. | T |
| 14. | C | 39. | T |
| 15. | B | 40. | T |
| 16. | C | 41. | T |
| 17. | D | 42. | T |
| 18. | C | 43. | T |
| 19. | A | 44. | T |
| 20. | D | 45. | F |
| 21. | B | 46. | T |
| 22. | C | 47. | T |
| 23. | D | 48. | T |
| 24. | T | 49. | T |
| 25. | T | 50. | T |