

YR 2 RESPIRATORY UNIT EXAMINATION -- January 19, 1999.

QUESTIONS 1 - 15 ARE PHOTO-RELATED QUESTIONS.

**Match the MOST LIKELY pulmonary morphologic finding at autopsy, labeled A - E, to each of the patient vignettes numbered 1 - 5 below. Each choice may be used once, more than once or not at all.**

- A. Photograph 1
- B. Photograph 2
- C. Photograph 3
- D. Photograph 4
- E. Photograph 5

1. A 69-year-old man slipped on ice-covered steps, fractured his femur and has been hospitalized for 5 days. He suddenly develops marked difficulty breathing, and dies abruptly in cardiac arrest.
2. A 15-year-old boy with a history of recurrent pneumonias and long standing chronic cough, productive of copious muco-purulent sputum, dies after a protracted, unresponsive pneumonia.
3. A 72-year-old man who died four months following diagnosis of high grade adenocarcinoma of the prostate.
4. A 70-year old man with no smoking history, and a diagnosis of Alzheimer's dementia, died soon after complaining to his caretakers that he has not been "breathing well" for many months. A previous employment history revealed he had worked as an apprentice pipefitter in a shipyard during the mid-1950's.
5. A previously healthy 14-year-old girl complained of moderate flu-like symptoms, including a dry cough, chest pain and low grade fever two weeks after returning home to Michigan from visiting grandparents in Tucson, Arizona.

Match the MOST LIKELY pulmonary morphologic finding at autopsy, labeled A - E, to each of the patient vignettes numbered 6 - 10 below. Each choice may be used once, more than once or not at all.

- A. Photograph 6
- B. Photograph 7
- C. Photograph 8
- D. Photograph 9
- E. Photograph 10

- 6. A 66-year-old man who had been successfully treated for reactivation tuberculosis 10 years earlier, presents on routine chest x-ray with a "mass" within an old tuberculous apical cavity.
- 7. An non-immunized 24-year-old man, receiving steroid therapy for an unrelated condition, develops a severe pneumonia and dies within days after babysitting a nephew with active measles.
- 8. A previously healthy 28-year-old woman presents with rapidly progressive shortness of breath, and episodes of fainting. A work-up revealed markedly increased pulmonary vascular resistance and pressures.
- 9. A 62 year-old man, who acknowledges smoking 2 packs/day for the last 40 years, complains of shortness of breath which has slowly worsened over the last 3-4 years. Spirometry and pulmonary function tests on this patient reveal increased residual volume (RV), and FRC, with decreased FEV<sub>1</sub> and FEV<sub>1</sub>/FVC ratio.
- 10. A 50 year-old coffee mill employee, who has worked in the industry for 20 years, demonstrates a restrictive ventilatory defect (low VC and low TLC), and a low diffusion capacity (DL<sub>CO</sub>) on pulmonary function tests.

**SINGLE ANSWER PHOTO-RELATED QUESTIONS**

11. The lesion visible in **PHOTO 11** is a common morphologic feature in all of the following conditions **EXCEPT**:
- A. Acute (adult) respiratory distress syndrome (ARDS)
  - B. Sarcoidosis
  - C. Neonatal respiratory distress syndrome (NRDS)
  - D. Toxic fume inhalation
  - E. Viral pneumonias
12. The morphologic lesion visible in **PHOTO 12** is MOST consistent with which of the following lung diseases:
- A. Pulmonary sarcoidosis
  - B. Bronchioloalveolar cell carcinoma (BAC)
  - C. Pulmonary hemorrhage
  - D. Cytomegalovirus (CMV) pneumonia
  - E. Bacterial pneumonia
13. A twenty-four old pilot trainee, in good physical condition, is found to have bilateral hilar adenopathy on chest x-ray. He is taken for mediastinoscopy and lymph node biopsy.
- PHOTO 13** is the high power histology of that biopsy. This patient MOST likely has:
- A. Viral pneumonia
  - B. Acute respiratory distress syndrome
  - C. Chronic Bronchitis
  - D. Sarcoidosis
  - E. Histoplasmosis

14. A peripheral lung nodule was resected from a 50 year-old man. The tumor shown in **PHOTO 14** is BEST classified as:
- A. Squamous cell carcinoma
  - B. Bronchioloalveolar cell carcinoma
  - C. Small cell carcinoma
  - D. Bronchial carcinoid
  - E. Undifferentiated large cell carcinoma
15. A 30 year old male hemophiliac presents to the ER with a two week history of a dry, nonproductive cough associated with dyspnea at rest and with exertion. He has bilateral chest pain on inspiration and a radiograph reveals an extensive bilateral interstitial and alveolar infiltrate. His transbronchial biopsy, shown in **PHOTO 15**, is MOST consistent with:
- A. Organizing bronchopneumonia
  - B. Desquamative interstitial pneumonitis (DIP)
  - C. *Pneumocystis carinii* infection
  - D. Adenocarcinoma
  - E. Usual interstitial pneumonitis (UIP)

**SINGLE ANSWER (NON-PHOTO RELATED)**

16. All of the following statements regarding pleural mesothelioma are TRUE, **EXCEPT**:
- A. It is known to be related to asbestos exposure
  - B. It has a direct precursor-product relationship with asbestos-induced pleural plaques
  - C. It often resembles an adenocarcinoma histologically
  - D. It is an uncommon tumor
  - E. It is not a true lung tumor

17. The best screening tool for asbestosis is:
- A. Chest x-ray
  - B. CT scan
  - C. Sputum inspection for asbestos fibers
  - D. Pulmonary function tests
  - E. Lung biopsy
18. Histologic features commonly present in diffuse interstitial lung fibrosis include all of the following **EXCEPT**:
- A. Increase in the internal surface area of the lung available for gas exchange
  - B. Increase in collagen within the alveolar septa
  - C. Hyperplasia of alveolar type 2 epithelial cells
  - D. Possible progression to end-stage or "honeycomb lung"
  - E. Infiltration of the alveolar wall with mononuclear cells (lymphocytes, macrophages, etc.)
19. All of the following statements concerning lung cancer are TRUE, **EXCEPT**:
- A. Squamous cell carcinomas usually arise in the central bronchi.
  - B. The trachea, among all portions of the tracheo-bronchial tree, is least commonly involved by malignant tumors.
  - C. Squamous metaplasia of the airways predisposes to bronchogenic carcinoma.
  - D. The majority of bronchioloalveolar cell carcinomas (BAC) develop in the major bronchi near the hilus.
  - E. Small cell lung cancer has the best initial response to chemotherapy.

**QUESTIONS 20 - 22 RELATE TO THE PATIENT DESCRIPTION BELOW.**

A 56 year old male comes to the clinic for evaluation of hemoptysis (coughing up blood). He has had a "smokers cough" for more than 20 years, but has never had hemoptysis before. He has some shortness of breath on exertion. Social history is significant for heavy smoking. Exam is remarkable for decreased breath sounds over the right lower lung field. Chest radiograph shows collapse of the right lower lobe of the lung.

20. The initial diagnostic consideration MOST consistent with this patient's findings is:
- A. Bacterial pneumonia.
  - B. Aspiration of a foreign body into the right mainstem bronchus.
  - C. Squamous cell carcinoma of the lung.
  - D. Adenocarcinoma of the lung.
  - E. Prostate cancer metastatic to the lung.
21. The first step in determining the diagnosis for this patient would be:
- A. Sputum cytology
  - B. Sputum for microbiology studies
  - C. Pulmonary function tests
  - D. Bronchoscopy with biopsies
  - E. Thoracic surgery.
22. Which of the following would be MOST suggestive that this patient might be a candidate for surgical resection of his lesion?
- A. Sputum cytology positive for small cell carcinoma.
  - B. CT scan of the chest showing bilateral enlarged hilar and mediastinal lymph nodes
  - C. Brain CT scan showing multiple defects
  - D. Pulmonary function tests showing mild obstructive disease
  - E. Malnutrition

23. The fibrotic lung disease, asbestosis, is MOST prevalent among:
- A. Iron-casting workers
  - B. Residents of pre-world war II inner city housing
  - C. Asbestos mine workers
  - D. Workers fabricating asbestos-containing products
  - E. Coal miners
24. The following patients presented to the emergency room with acute airway or breathing difficulties. Which patient would MOST likely have the greatest increase in total respiratory system resistance based on their acute problem?
- A. A 5 year old child who comes to the ER in distress with a peanut lodged in the left nostril.
  - B. A 25 year old motor cycle hot shot who comes to the ER via ambulance after crashing into a guard rail during a race. The physicians quickly discover he has suffered a crush injury to his trachea.
  - C. A 65 year old male with a chronic smokers' cough is admitted with right lower lobe bronchopneumonia.
  - D. A 45 year old Grateful Dead fan is brought to the emergency room in respiratory distress. It is later determined that he has smoked paraquat tainted marijuana and has acute lung injury.
  - E. A 25 year old female brought in comatose as a suspected drug overdose. Her spontaneous respiratory rate on arrival is noted to be 3 breaths per minute.
25. Which of the 5 patients listed below has documented alveolar hypoventilation?
- A. 60 year old breathing 8 times per minute.
  - B. 60 year old with a tidal volumes of 300 cc.
  - C. 60 year old with a PaO<sub>2</sub> of 47 mm Hg.
  - D. 60 year old with PaCO<sub>2</sub> of 59 mm Hg.
  - E. 60 year old with minute ventilation of 2 liters per minute.

26. A respiratory event during sleep manifested as the complete absence of airflow for greater than 10 seconds associated with either a decrease in oxygen saturation or an arousal represents:
- A. Apnea
  - B. Hypopnea
  - C. Respiratory pause
  - D. Periodic breathing
  - E. Respiratory alternans.
27. Ventilation is altered during both non REM and REM sleep. The feature which distinguishes the effects of REM sleep from those of non REM sleep is:
- A. Muscle atonia
  - B. Reduced tidal volume
  - C. Elevated PaCO<sub>2</sub>
  - D. Decreased upper airway diameter
  - E. Increased upper airway resistance
28. Cardiovascular consequences of obstructive sleep apnea include all the following EXCEPT:
- A. Ventricular arrhythmias
  - B. Increased stroke volume
  - C. Right ventricular enlargement
  - D. Bradycardia
  - E. Decreased cardiac index

29. A 55 year old man, who has worked for 20 years as a pipe coverer, has shortness of breath walking up a slight hill. He has a 30 pack year smoking history. He has pleural plaques on chest x-ray. His FVC is 70%, his TLC is 65% and his DL<sub>CO</sub> is 70%. Which of the following would be MOST important in the management of this patient?
- A. Have home environment checked for asbestos
  - B. Quit smoking
  - C. Bronchodilation therapy
  - D. Lung biopsy
  - D. Corticosteroid inhalation therapy
30. Toxic fumes and gases, such as ozone, chlorine and fire smoke, when inhaled are known to produce which one of the following lesions within 24 to 72 hours?
- A. Interstitial fibrosis
  - B. Acute (adult) respiratory distress syndrome (ARDS)
  - C. Squamous metaplasia of bronchi
  - D. Primary pulmonary hypertension
  - E. Centriacinar emphysema
31. Acute exposure to very high levels of silica results MOST commonly in:
- A. Formation of ferruginous bodies
  - B. Silica-induced alveolar lipo-proteinosis
  - C. Diffuse interstitial fibrosis
  - D. Progressive massive fibrosis
  - E. Silicotic nodules

32. A lower than normal time constant (resistance X compliance) may be seen in which of the following disorders?
- A. Asthma
  - B. Chronic bronchitis
  - C. Sarcoidosis
  - D. Emphysema
  - E. Bronchiectasis
33. What history would MOST strongly lead you to consider the diagnosis of asthma in a patient who had pulmonary function testing showing a low FEV<sub>1</sub> and a low FEV<sub>1</sub>/FVC?
- A. Cough in the early morning hours.
  - B. Cough with thick mucoid sputum production
  - C. Family history of hay fever
  - D. Good days and bad days
  - E. History of cigarette smoking
34. Primary squamous cell carcinoma of the lung and reactivation tuberculosis of the lung are similar in that they both are commonly associated with:
- A. Silicosis
  - B. Cavitation
  - C. Ectopic production of a parathyroid hormone-like peptide
  - D. Spread to the same most common extrapulmonary site
  - E. Pre-existing lung scars

35. A 55 year-old man, with an 80 pack-year smoking history, presents with a chronic productive cough that has been present for at least 8 out of 12 months over the last 6 years. Which of the following pathological changes in the airways is LEAST likely to occur?
- A. Mucous (goblet) cell hyperplasia of the major bronchi
  - B. Squamous metaplasia with loss of cilia
  - C. An increased ratio of bronchial submucosal gland width to total mucosal thickness (increased Reid index)
  - D. A significant eosinophilic inflammatory infiltrate
  - E. Bronchial wall edema
36. Which of the following types of lung cancer is MOST likely to develop within or be associated with an area of peripheral scar tissue?
- A. Squamous cell carcinoma
  - B. Small cell carcinoma
  - C. Bronchial carcinoid
  - D. Adenocarcinoma
  - E. Large cell carcinoma
37. The recent El Nino weather phenomenon caused the desert southwest to experience an exceptionally abundant spring bloom of desert flowers. An amateur botanist on the school of medicine faculty visited the desert to see this "once in a decade event", but developed fever, a cough, joint aches, chest pain and erythema nodosum two weeks after returning to Detroit. Chest x-ray revealed a left sided pleural effusion. The MOST likely diagnosis is:
- A. Histoplasmosis
  - B. Coccidioidomycosis
  - C. Blastomycosis
  - D. *Mycoplasma pneumoniae* infection
  - E. *Mycobacterium ulcerans*

38. In a patient with situs inversus, recurrent sinopulmonary infections and sterility, the MOST likely mechanism responsible for these findings is:
- A. A defect in exocrine secretions
  - B. A defect in humoral immunity
  - C. A defect in cellular immunity
  - D. A defect in ciliary structure and function
  - E. An immune complex disease
39. During an asthma attack, which of the following is the MOST ominous sign?
- A. Tachypnea with absent breath sounds
  - B. Intercostal retractions
  - C. Wheezing on both inspiration and expiration
  - D. Use of accessory muscles during respiration
  - E. Pulsus paradoxus
40. Which of the following statements concerning expiration is CORRECT?
- A. At lung volumes close to total lung capacity, expiratory flow is independent of expiratory effort.
  - B. At lung volumes close to total lung capacity, airway resistance is at its peak.
  - C. At lung volumes close to total lung capacity, expiratory flow increases with increasing pleural pressures
  - D. At 50% of total lung capacity, increased expiratory effort results in decreased airway resistance
  - E. At lung volumes close to residual volume, airways resistance is minimal

41. The SINGLE best test to order for a patient with a suspected pulmonary embolism is:
- A. Electrocardiogram
  - B. Chest radiograph
  - C. Doppler or ultrasound of the lower extremities
  - D. Ventilation perfusion lung scan
  - E. CT scan of the chest
42. The MOST common cause of pulmonary artery hypertension is:
- A. Chronic hypercarbia
  - B. Chronic hypoxemia
  - C. Left ventricular failure
  - D. Plexogenic lesions
  - E. Right to left vascular shunt
43. Which of the following conditions is associated with a left shift of the oxygen dissociation curve?
- A. COPD (chronic obstructive pulmonary disease)
  - B. Being employed as a toll taker on the turnpike
  - C. Fever of 103 degrees
  - D. Diabetic ketoacidosis
  - E. Anemia

44. When comparing the pulmonary vascular circulation to the systemic circulation, all the following are true EXCEPT:
- A. The pressures in the pulmonary circulation are lower.
  - B. The resistance in the pulmonary circulation is higher.
  - C. The capacitance of the pulmonary circulation is higher.
  - D. The percentage of the cardiac output distributed to the pulmonary circulation is equal to that distributed to the systemic circulation.
  - E. There is less vascular musculature for the pulmonary vascular system.
45. Primary pulmonary hypertension occurs in the clinical setting of:
- A. COPD
  - B. Pulmonary embolism
  - C. Pulmonary artery atherosclerosis
  - D. Interstitial lung disease
  - E. A normal heart perfusing normal lung parenchyma
46. Therapy for Cor pulmonale must include:
- A. Diuretics
  - B. Digitalis preparations
  - C. Mechanical ventilation
  - D. Methylxanthines
  - E. Oxygen

47. Considering all patients with a new diagnosis of lung cancer (any and all cell types), the overall 5 year expected survival rate after appropriate therapy is approximately:
- A. 60%
  - B. 50%
  - C. 30%
  - D. 15%
  - E. 0

QUESTIONS 48 - 49 RELATE TO THE PATIENT DESCRIPTION BELOW.

A 29 year old African American female comes to the clinic complaining of dry cough, exertional dyspnea and 20 pound weight loss. On examination, there is no fever. Lung exam reveals a few scattered crackles. Chest x-ray reveals bilateral hilar adenopathy.

48. Pulmonary function tests in this patient would MOST likely show:
- A. Low FEV<sub>1</sub> and FEV<sub>1</sub>/FVC ratios.
  - B. Normal TLC with elevated RV
  - C. Low DL<sub>CO</sub> (diffusing capacity for carbon monoxide)
  - D. Response to bronchodilators
  - E. Response to methacholine
49. The MOST helpful diagnostic result in the above patient would be:
- A. Lung biopsy showing non caseating granulomas
  - B. Negative PPD skin test
  - C. Restrictive defect on pulmonary function testing
  - D. Bronchoalveolar lavage positive for large numbers of lymphocytes
  - E. CT scan of the chest showing 3 cm hilar lymph nodes

50. Which of the following clinical findings would indicate the patient has alveolar hypoventilation?
- A. Respiratory rate of 7 breaths per minute.
  - B. Minute ventilation of 4 liters per minute.
  - C. Tidal volume of 300 cc
  - D.  $\text{PaO}_2 = 47$
  - E.  $\text{PaCO}_2 = 51$
51. A 64 year old male with a long standing history of respiratory difficulty comes to the emergency room in acute respiratory distress. The severe shortness of breath came on very suddenly and was accompanied by pain on the right side of the chest radiating to the right shoulder area. He has a 100 pack year smoking history but no history of cough or sputum production. His dyspnea has been slowly progressing over about the past 5 years. His exam is remarkable for diminished breath sounds on the left and no audible breath sounds over the right chest.

The MOST likely cause of the patient

- A. Pneumonia
- B. Pneumothorax
- C. Congestive heart failure
- D. Myocardial infarction
- E. Bronchitis

52. A patient with chronic dyspnea as well as chronic cough and sputum production develops an increase in sputum production and worsening dyspnea over 2 days. His temperature is 100.9 and the chest exam is remarkable for bilateral wheezes and rhonchi. Chest x-ray shows a mild increase in heart size and increased lung markings throughout the lung fields. A pulse oximeter is used to measure the patient 79%. Supplemental oxygen is given to increase the saturation to 90%. Arterial blood gases drawn after placing the patient on oxygen would most likely show:

	<u>pH</u>	<u>PCO<sub>2</sub></u>	<u>PO<sub>2</sub></u>
A.	7.40	38	86
B.	7.37	53	60
C.	7.47	33	53
D.	7.41	41	70
E.	7.41	34	41

### MATCHING ITEMS

Match the list of diagnostic possibilities, labeled A-E, with the MOST likely patient case histories numbered 53 to 55 below. Each choice may be used once, more than once or not at all.

- A. Idiopathic pulmonary fibrosis
- B. Sarcoidosis
- C. Histiocytosis X
- D. Lymphangioleiomyomatosis
- E. Occupational lung disease

53. A 25 year old male presents with a right sided pneumothorax. This problem resolves after insertion of a chest tube. His chest radiograph shows bilateral upper lobe interstitial infiltrates. His lab studies are remarkable for a persistent hyponatremia (low serum sodium). Evaluation of this problem reveals he has diabetes insipidus.
54. A 65 year old male presents with progressive dyspnea. He states he first noticed breathing difficulty about 6 months ago, following a viral respiratory infection. He has a dry cough. He is a life long non-smoker. He has no history of significant occupational or environmental exposures. Exam is positive for bilateral coarse crackles over both lung fields. Chest x-ray shows diffuse interstitial infiltrates.
55. A 65 year old male presents with progressive dyspnea. He feels this problem has been increasing over the past 2 years. He denied cough or chest pain. His history includes work as a pipe and boiler insulation technician for 35 years. Exam is positive for lower lung field crackles. Chest x-ray shows bilateral lower lung zone interstitial infiltrates and dense calcifications along the diaphragmatic pleural surface.

Although bronchoalveolar lavage is not usually thought of as a diagnostic test, findings have proven useful in hypothesizing about the pathophysiology of lung diseases.

**Match the bronchoalveolar lavage (BAL) findings, labeled A-E, with the MOST likely patient description numbered 56 - 58 below. Each choice may be used once, more than once or not at all**

- A. Increased total cell number; increased neutrophils.
- B. Increased total cell number; increased T6 lymphocytes
- C. Increased total cell number; increased T4 lymphocytes
- D. Increased total cell number; increased T8 lymphocytes
- E. Increased total cell number; increased IgM

- 56. A 55 year old smoker with daily morning cough, productive of yellow sputum.
- 57. A 25 year old with dyspnea and cough, crackles over both lung fields and a chest x-ray revealing bilateral hilar adenopathy and interstitial infiltrates.
- 58. A 40 year old dairy farmer who is newly diagnosed as having Farmer's Lung disease.

Match the pulmonary function results, labeled A-E, with the MOST likely patient description numbered 59 - 63 below. Each choice may be used once, more than once or not at all.

	<u>FEV1</u>	<u>FEV<sub>1</sub>/FVC</u>	<u>TLC</u>	<u>RV</u>	<u>DL<sub>co</sub></u>
A.	Low	Low	Normal	High	High
B.	Low	Low	High	High	Low
C.	Low	High	Low	Low	Low
D.	Low	High	Low	Low	Normal
E.	Low	High	Normal	Normal	Normal

59. A 35 year old male is evaluated for shortness of breath. He is seeking workman's compensation for occupational lung disease. His history is remarkable only for the shortness of breath. His examination is entirely normal except for moderate obesity. His chest x-ray shows no gross abnormalities.
60. A 20 year old seeks attention for shortness of breath. He has not previously had problems but over the past 2 months notes he develops chest tightness and difficulty breathing within 5 minutes of beginning his morning run in the neighborhood. During the summer, he had no difficulty running for upwards of 30 minutes. Examination reveals only end expiratory wheezes on forced exhalation.
61. A 60 year old is evaluated for shortness of breath. He states the problem has been getting worse over the past 2 years. He has a 60 pack year smoking history but denied cough or sputum production. Exam reveals distant breath sounds. Chest x-ray shows marked hyperinflation, a small heart, but no infiltrates.
62. A staff pulmonologist requests a volunteer for respiratory physiology experiments and a medical student from the class of 2001 reluctantly agrees to participate, thinking it might improve his chances of passing the upcoming examination. The student's chest is wrapped tightly with duct tape and he is then asked to perform a complete pulmonary function test. He is a little uncomfortable, finds it difficult to take a deep breath, but does make a good effort to perform the test to the best of his ability.
63. A 63 year old male is evaluated for shortness of breath. The problem has been worsening over the past 2 years. He has noted a dry cough but denies chest pain. Occupational history is negative. He smoked a few cigarettes a day in his teens and twenties but has not smoked at all for at least the past 30 years. Exam reveals crackles over both lung fields and the chest x-ray shows diffuse interstitial infiltrates.

Match the type of lung cancer, labeled A-E, MOST likely to be found on cytologic or histologic evaluation of the patients with lung cancer numbered 64 - 66 below. Each choice may be used once, more than once or not at all.

- A. Squamous cell carcinoma
- B. Adenocarcinoma
- C. Small cell carcinoma
- D. Bronchoalveolar cell carcinoma
- E. Metastatic carcinoma to the lungs

64. A 59 year old female comes to her physician for a routine yearly examination. She has had no significant symptoms. Social history is positive for a 100 pack year smoking history. Physical exam is positive for bilateral end expiratory wheezes and rhonchi. Chest x-ray shows a 2 cm irregular nodule in the right upper lobe.
65. A 62 year old male seeks medical attention for swelling of his face and pain in his back. He has been a heavy smoker and carries a diagnosis of severe chronic bronchitis. Evaluations disclose that he has several pathologic vertebral fractures, most likely due to metastatic cancer and that he has Cushing's syndrome with elevated ACTH.
66. An 85 year old female has received several courses of antibiotics for presumed right lower lobe pneumonia, but her symptoms of cough and sputum have failed to resolve. The chest x-ray shows an infiltrate in the left lower lung. Sputum cytology is positive.

Match the MOST likely agent, labeled A - E, with the patient vignettes numbered 67 - 68 listed below. Each choice may be used once, more than once or not at all.

- A. Asbestos
- B. Silica
- C. Bird droppings
- D. Coal dust
- E. Thermophilic actinomycetes

- 67. A 45 year-old agricultural worker reports he develops a dry cough and dyspnea each time he helps stack hay bales in the barn loft. These respiratory episodes have gotten more severe over the last year to the point where he is short of breath nearly all the time.
- 68. After a suspicious chest x-ray, a 61 year-old tombstone engraver undergoes PPD skin testing. A 15 mm induration is measured at the site.
- 69. After complaining of difficulty breathing, a 52 year-old brake shop foreman receives a chest x-ray which demonstrates the presence of calcified plaques on the pleura and diaphragm.
- 70. Pulmonary function tests in a 56 year-old male nonsmoker reveals the presence of a form of centrilobular (centriacinar) emphysema known as "focal" emphysema.

Match the disease process, labeled A -E, with one of the statements or conditions numbered 71 - 75 below. Choices may be used once, more than once or not at all.

- A. Asthma
- B. Chronic Bronchitis
- C. Panacinar Emphysema
- D. Centriacinar Emphysema
- E. Bronchiectasis

- 71. A common disease of cigarette smokers that primarily effects the upper lung zones early in the disease process.
- 72. A family history of "hay fever" and dermatitis.
- 73. The Reid Index is a useful morphologic measure of disease severity.
- 74. Recurrent necrotizing infections associated with ciliary dysfunction
- 75. Associated with homozygous alpha-1 anti-protease (anti-trypsin) deficiency

Match the following list of lung neoplasms, labeled A - F with the descriptive features of lung tumors numbered 76 - 78 below. Each choice may be used once, more than once or not at all.

- A. Adenocarcinoma (common type)
- B. Adenocarcinoma (bronchioloalveolar type)
- C. Squamous cell carcinoma
- D. Small cell (oat cell) carcinoma
- E. Carcinoid
- F. Large cell carcinoma

- 76. Grows along alveolar septa; multicentric or diffuse forms; columnar or cuboidal cells with abundant mucus production.
- 77. Often protrudes into the bronchus like a polyp; grows in clusters or ribbons of cells; rich blood supply; cells contain neurosecretory granules.
- 78. Located in major airways near the hilum; large cells with intercellular bridges; frequently associated with hypercalcemia.

Match the physiologic parameters labeled, A - E, to the patient descriptions numbered 79 - 82 below. Each choice may be once, more than once or not at all.

	<u>Resistance</u>	<u>Compliance</u>
A.	Normal	Normal
B.	Increased	Normal
C.	Increased	Decreased
D.	Normal	Increased
E.	Normal	Decreased

79. A 16 year old with recurrent respiratory infections, malnutrition and elevated sweat chloride.
80. A 25 year old with episodic difficulty breathing who comes to ER manifesting wheezing and tachypnea. The patient has a history remarkable only for allergies.
81. A 63 year old man with dyspnea progressive over the past 2 years. His exam is positive for crackles over both lung fields and the chest x-ray shows diffuse interstitial infiltrates. Pulmonary function tests are remarkable for relatively normal airflows, with a decrease in total lung capacity and diffusing capacity.
82. A 22 year old with anxiety and depression facing surgery for removal of a skin lesion.

Match the MOST likely physiologic mechanism of hypoxia, labeled A - E, that is at work in the patients (all of whom are hypoxic), numbered 83 - 84 below. Choices may be used once, more than once, or not at all.

- A. Hypoventilation
- B. Increased dead space
- C. Mismatch of ventilation and pulmonary perfusion
- D. Shunting from the right sided circulation to the left sided cardiac circulation.
- E. Diffusion defect.

83. A 62 year old male in respiratory distress. He has a long history of cigarette smoking and has had exertional dyspnea for many years. He is very thin. Vital signs are: Blood pressure = 129/70, pulse = 112, respiratory rate 35. Breath sounds are diminished over both lungs. The Chest x-ray shows marked hyperinflation and a small cardiac shadow.

84. A 57 year old patient who is 2 days post surgery for attempted resection of a colon cancer. At surgery he was found to have metastases to the liver. He had a sudden onset of respiratory distress and chest pain upon attempting to get out of bed and walk. On exam, it was noted that his left calf was swollen and tender. V/Q (ventilation/perfusion) scan is positive for a large perfusion defect in the right lower part of the lung, with normal ventilation.

Match the MOST likely cause of excessive daytime sleepiness, labeled A-E, with the patient vignettes numbered 85 - 86 below. Each choice may be used once, more than once or not at all.

- A. Obstructive sleep apnea.
- B. Narcolepsy
- C. Lack of sleep
- D. Psychiatric disease
- E. Sleep wake cycle disorder

- 85. A 23 year old Year II medical student with no known medical history who persistently falls asleep during very stimulating lectures on pulmonary pathophysiology.
- 86. A 52 year old male whose wife brought him to the doctor because his snoring and choking during the night keep her awake. She also revealed that her husband had difficulty staying awake during church services and while watching television.

Match the MOST likely infections, labeled A-F, with the patient descriptions numbered 87 - 91 below. Choices may be used once, more than once, or not at all.

- A. Pneumococcal pneumonia
- B. Hemophilus pneumonia
- C. Mycoplasma pneumonia
- D. Pseudomonas pneumonia
- E. Staphylococcal pneumonia
- F. Anerobic infection

- 87. A 65 year old postal worker retired to a bayou cottage in Louisiana. He had no significant medical history, although his social history revealed almost daily cigar smoking for the past 20 years. He developed fever, cough productive of yellowish red sputum and right sided chest pain.
- 88. A 30 year old surgery resident developed chills, fever and a productive cough the night after being on call at the DRH emergency room. He complains of difficulty breathing.
- 89. A 20 year old college student comes to the health clinic complaining of a hacking cough, muscles aches and feeling feverish. The examination is unremarkable except for a few crackles heard over the right lower lung field. The patient is unable to bring up any sputum for gram stain or culture.
- 90. A 62 year female is hospitalized for an exacerbation of congestive heart failure. She was slowly improving with therapy but on the 5th hospital day, developed fever, cough, hypoxia and an increased white blood cell count. She rapidly deteriorated and required admission to the intensive care unit and mechanical ventilation. A portable chest x-ray showed extensive infiltrates in the left lung.
- 91. A malnourished 50 year old man, known alcoholic, comes to the ER complaining of malaise and right chest pain over the past 2 weeks. He has a fever and is noted to have severe dental caries and to be coughing up large amounts of extremely bad smelling brownish mucus.

Match the MOST appropriate clinical action, labeled A - E, with the patient descriptions numbered 92 - 95 below. Choices may be used once, more than once, or not at all.

- A. Observations and follow up.
- B. Isoniazid alone
- C. Isoniazid + Rifampin + Pyranzinamide + ethambutol + streptomycin
- D. Obtain sputum samples and chest x-ray
- E. Surgical resection of all abnormal lung.

- 92. A 50 year old man whose wife has tuberculosis and who has a PPD skin test reaction of 20 mm. He is asymptomatic and has a normal chest x-ray.
- 93. A 25 year old medical student who converted his PPD skin test from no reaction to 15 mm of induration between Year III and Year IV. He has not been feeling well, complaining of malaise, a 10 pound weight loss and a persistent cough.
- 94. A 21 year old male from Georgia is beginning medical school. His PPD is 6 mm induration. He has never been skin tested before and does not think he has ever been exposed to tuberculosis.
- 95. A 3 year old child is brought to the health department because her mother has just been diagnosed as having cavitary tuberculosis. The child has no symptoms and has a normal chest x-ray. The PPD is 5 mm induration.

Two patients, with no previous history of lung disease, undergo abdominal surgery. Arterial blood gases (ABGs) are drawn post operatively and are listed as:

Patient #1; PaO<sub>2</sub> = 85 and PaCO<sub>2</sub> = 24.

Patient #2; PaO<sub>2</sub> = 70 and PaCO<sub>2</sub> = 56.

Match the patient or patients, labeled A-E, with the statements numbered 96 - 97 below. Each choice may be used once, more than once or not at all.

- A. Patient #1 only
- B. Patient #2 only
- C. Both patient #1 and #2
- D. Neither patient #1 nor #2
- E. Laboratory error is likely for patient #2

96. An agent to reverse narcotic/sedative effects is indicated.

97. Findings indicate a primary lung problem has developed.

Match the following conditions or abnormalities, labeled A-E, with the patient descriptions numbered 98 - 100 below. Each choice may be used once, more than once, or not at all.

- A. Cystic fibrosis
- B. Respiratory distress syndrome
- C. Immotile cilia syndrome
- D. Sudden infant death syndrome
- E. Tracheo-esophageal fistula

98. A four day old infant is noted to have frequent spells of coughing and choking associated with feedings.
99. A 3 year old male has daily coughing spells, chronic diarrhea and low weight gain for his age and height.
100. A baby born at 28 weeks gestational age develops grunting respirations, hypoxia and respiratory acidosis 24 hours after birth.