Pathology 621
NAME:_____
EXAM 1
Monday, September 24, 2001, 8:00 a.m. – 9:50 a.m.
PHOTO QUESTIONS. **SELECT THE SINGLE BEST ANSWER.**

Photo question 1 (1 photo, 1 question)

1. Which of the following best explains what preceded this lesion?

   A. Mural thrombus formation in a left ventricular aneurysm
   B. Thrombosis of the femoral or popliteal arteries
   C. Thrombosis of deep veins of the lower extremity
   D. Thrombosis of the pulmonary artery
   E. Thrombosis of the pulmonary vein

Photo question 2 (1 photo, 1 question)

2. This photomicrograph of a gastric lesion shows a mucosal defect. Which of the following is **TRUE**?

   A. The top layer closest to the luminal surface is a transudate.
   B. The layer beneath the band of material on the luminal surface is granulation tissue.
   C. The layer beneath the band of material on the luminal surface contains lymphocytes and epithelioid cells.
   D. A and B are both true.
   E. B and C are both true.

Photo question 3 (1 photo, 1 question)

3. Which of the following is **TRUE** concerning this photomicrograph?

   A. The diagnosis is pulmonary edema.
   B. The underlying etiology is right ventricular failure.
   C. The underlying etiology is left ventricular failure.
   D. Both A and B are true.
   E. Both A and C are true**.**

Photo question 4 (1 photo, 1 question)

4. Which of the following is **TRUE** concerning the different lesions seen in this heart?

   A. Coagulative necrosis is present.
   B. Granulation tissue formation can be found.
   C. Fibrous scarring is present.
   D. Ischemic episodes produced the lesions.
   E. All of the above are true.

Photo question 5 (3 photos, 1 question)

5. Lesions similar to those illustrated in these gross and microscopic images are produced by bacteria that are primarily transmitted

   A. by aerosolized droplets
   B. through contaminated blood products
   C. vertically
   D. via shared needles
   E. via contaminated hands

GO TO THE NEXT PAGE

SELECT THE SINGLE BEST ANSWER.

6. You are doing research to develop a new anti-inflammatory treatment. You decide to focus on blocking the transmigration of neutrophils through the endothelial lining to prevent the inflammatory response. What would be the best compound to focus on, from the list below, to directly prevent the transmigration of neutrophils?

   A. PECAM inhibitor
   B. chemokine blocker
   C. L-selectin blocker
   D. histamine blocker

7. Which of the following cells is typically characteristic of chronic inflammation?

   A. plasma cell
   B. macrophage
   C. lymphocyte
   D. eosinophil
   E. all of the above

8. Which of the following is characterized by angiogenesis and by dividing and plump (juicy) fibroblasts?

   A. granuloma
   B. granulation tissue
   C. metaplasia
   D. intracellular hemosiderin accumulation
   E. all of the above

9. What phenomenon characterizes reversible cell injury?

   A. cell swelling and bleb formation
   B. dilated endoplasmic reticulum and mitochondrial swelling
   C. fatty change
   D. all of the above
   E. none of the above

10. What phenomenon is primarily responsible for cell swelling early in cell injury?

    A. influx of Ca^{++}
    B. influx of Na^{+}
    C. influx of K^{+}
    D. intracellular hemosiderin accumulation
    E. none of the above

GO TO THE NEXT PAGE

11. The fragmentation of the nucleus and nuclear chromatin into irregular clumps in cell injury is referred to as:

    A. karyorrhexis
    B. pyknosis
    C. karyolysis
    D. intracellular hemosiderin accumulation
    E. all of the above

12. Which of the following refers to intracellular accumulation of carbon?

    A. anthracosis
    B. hemochromatosis
    C. steatosis
    D. cholesterolosis
    E. none of the above

13. A patient is found to have very high levels of parathyroid hormone and calcifications in many tissues. What would be the best description of this observation?

    A. dystrophic calcification
    B. metastatic calcification
    C. metaplasia
    D. intracellular hemosiderin accumulation

14. Phagocytosis of apoptotic bodies by macrophages is best characterized as:

    A. autophagy
    B. granulation tissue
    C. heterophagy
    D. intracellular hemosiderin accumulation

15. Which endogenous pigment is a product of lipoprotein oxidation and thus an indicator of possible oxidative stress?

    A. Melanin
    B. Lipofuscin
    C. Hemosiderin
    D. Bilirubin

16. Which of the following is possible in an area of cell injury?

    A. Necrosis
    B. Apoptosis
    C. Acute inflammation
    D. Formation of granulation tissue
    E. All of the above

GO TO THE NEXT PAGE

17. DNA laddering in apoptosis is caused by activation of endonucleases. Which of the following is directly responsible for endonuclease activation in apoptosis?

    A. Thrombspondin
    B. Execution caspases
    C. Activation caspases
    D. Bcl-2
    E. Growth factors

18. Which of the following is not mediated by a type II hypersensitivity mechanisms?

    A. anti-acetyl choline receptor antibodies in myasthenia gravis
    B. complement-dependent reactions that lead to lysis of cells or render them susceptible to phagocytosis
    C. antibody-dependent cell-mediated cytotoxicity (ADCC)
    D. long acting thyroid stimulator IgG antibodies (LATS) in Graves' disease
    E. systemic anaphylaxis

19. Primary mediators of Type I hypersensitivity include all of the following **EXCEPT**:

    A. leukotrienes
    B. biogenic amines
    C. eosinophil and neutrophil chemotactic factors
    D. proteases
    E. proteoglycans

20. Autoimmune diseases may result from all of the following **EXCEPT**:

    A. failure of peripheral tolerance
    B. hyporeactivity of CD4+ helper/inducer T_H1 cells
    C. antibody-complement-mediated cell membrane injury
    D. anti-receptor antibodies
    E. antigen-antibody-complement complex deposition in tissues

21. Diseases or reactions with a type IV mechanism of hypersensitivity include all of the following **EXCEPT**:

    A. myasthenia gravis
    B. tuberculosis
    C. histoplasmosis
    D. contact dermatitis
    E. transplant rejection

22. Primary Sjögren's syndrome is characterized by all of the following **EXCEPT:**

    A. lymphocytic infiltration of salivary glands
    B. xerostomia
    C. keratoconjunctivitis sicca
    D. rheumatoid arthritis as an associated disorder
    E. anti-SS-A and anti-SS-B autoantibodies

GO TO THE NEXT PAGE

23. CREST syndrome (localized scleroderma) is characterized by all of the following **EXCEPT**:

    A. anti-centromere autoantibodies
    B. calcinosis
    C. anti-Scl-70 (DNA topoisomerase I) autoantibodies
    D. limited skin involvement and late visceral involvement
    E. esophageal dysmotility

24. All of the following are true of rheumatoid factors (RF) **EXCEPT**:

    A. are mostly of the IgM class of autoantibodies
    B. are the cause of rheumatoid arthritis
    C. are autoantibodies to the Fc portion of autologous IgG
    D. occur in about 80% of rheumatoid arthritis patients
    E. self associate (RF-IgG) to form immune complexes in the sera, synovial fluid and synovial membranes.

25. Amyloid, which has an amorphous, eosinophilic, hyaline fibrillar appearance, accumulates progressively in an extracellular location where it encroaches on and produces pressure atrophy of adjacent cells. All of the following statements are true of amyloid, **EXCEPT**:

    A. The AL type is associated with multiple myeloma.
    B. The AA (amyloid-associated) type may follow chronic inflammatory conditions.
    C. Amyloid deposition may cause conduction defects in the heart.
    D. β_2-microglobulin accumulation constitutes a type of amyloid classically associated with Alzheimer's disease.
    E. Amyloid in tissues stained with Congo red appears reddish and exhibits greenish birefringence by polarized light microscopy.

26. All of the following are true of acute graft-versus-host disease **EXCEPT**:

    A. requires an immunologically suppressed recipient
    B. injures the immune system and epithelia of the skin, liver and intestines
    C. requires immunocompetent lymphoid cells in donor marrow
    D. is mediated by large granular lymphocytes
    E. requires histoincompatibility between bone marrow donor and recipient.

27. Cells that are targets of HIV infection include all of the following **EXCEPT**:

    A. follicular dendritic cells
    B. mast cells
    C. CD4+ T cells
    D. Macrophages
    E. monocytes

GO TO THE NEXT PAGE

28. The best marker of HIV disease progression, that is of great clinical value in patient management, is:

    A. extent of HIV-1 viremia (viral load), measured as HIV-1 RNA
    B. decreased absolute CD4+ lymphocyte count
    C. C-C chemokine level
    D. CCR5 coreceptor expression
    E. CD4/CD8 ratio

29. Reduced expression of MHC class I molecules by tumor cells or virus infected cells interrupts inhibitory signals which leads to:

    A. NK cell-mediated killing of target cells
    B. macrophage-mediated killing of target cells
    C. CD8+ T cell-mediated killing of target cells
    D. dendritic cell-mediated killing of target cells
    E. CD4+ T cell-mediated killing of target cells

30. A localized area of tissue necrosis resulting from acute immune complex vasculitis, usually in the skin, is known as:

    A. Goodpasture's syndrome
    B. Arthus reaction
    C. type IV hypersensitivity reaction
    D. Shwartzman reaction
    E. Herxheimer reaction

31. Cytokines, secreted by T_H1 cells, which are responsible for the expression of delayed-type hypersensitivity, include all of the following **EXCEPT**:

    A. TNF-α and lymphotoxin
    B. IL-8
    C. IFN-γ
    D. IL-2
    E. IL-12

32. All of the following are true of "lupus anticoagulant" **EXCEPT**:

    A. includes antibodies against phospholipid β_2–glycoprotein complex
    B. includes antibodies that interfere with *in vitro* clotting tests, such as partial thromboplastin time
    C. is associated with an anticoagulant state *in vivo*
    D. is associated with venous and arterial thromboses, recurrent spontaneous miscarriages and focal cerebral or ocular ischemia
    E. is associated with a false positive test for syphilis

GO TO THE NEXT PAGE

33. Antibodies most commonly associated with the inflammatory myopathy polymyositis are:

    A. Jo-1 antibodies against histidyl-tRNA synthetase
    B. anti-histone antibodies
    C. anti-Scl-70 antibodies to DNA topoisomerase I
    D. anti-double stranded DNA antibodies
    E. SS-A(Ro) and SS-B(La) antibodies against ribonucleoprotein

34. Chronic renal allograft rejection is characterized by all of the following **EXCEPT**:

    A. arterial and arteriolar intimal thickening causing stenosis or obstruction
    B. interstitial fibrosis
    C. anti-histone autoantibodies
    D. thick glomerular capillary walls
    E. tubular atrophy

35. All of the following are true of X-linked agammaglobulinemia of Bruton **EXCEPT**:

    A. is characterized by failure of pro-B cells and pre-B cells to differentiate into mature B cells
    B. is caused by mutations in a cytoplasmic tyrosine kinase (*btk*), thereby blocking signal transduction for B cell maturation
    C. is seen almost entirely in females
    D. does not become apparent until after 6 months of age when maternal immunoglobulins are depleted
    E. T cell-mediated reactions are normal

36. The feature common to all patients with common variable immunodeficiency is:

    A. hypogammaglobulinemia
    B. reduced numbers of B cells
    C. male predominance
    D. histologically, B cell areas of lymphoid tissues are depleted
    E. a decreased risk of lymphoid malignancy.

37. Which of the following immunodeficiency presents in infants with congenital heart defects and severe hypocalcemia (due to hypoparathyroidism)?

    A. Bruton's X-linked infantile hypogammaglobulinemia
    B. transient hypogammaglobulinemia of infancy
    C. common variable immunodeficiency
    D. Wiskott-Aldrich syndrome
    E. DiGeorge syndrome

GO TO THE NEXT PAGE

38. Chronic granulomatous disease is characterized by all of the following **EXCEPT**:

    A. an enzyme defect associated with NADPH oxidase
    B. increased oxygen consumption and increased glucose utilization by the hexose monophosphate shunt
    C. neutrophils that phagocytize microorganisms but do not form superoxide and other oxygen intermediates
    D. decreased intracellular killing of bacteria and fungi
    E. diagnosis confirmed by quantitative NBT test and quantitative killing curve

39. In flow cytometry, forward scatter indicates.

    A. granularity
    B. size
    C. cell number
    D. channel number
    E. fluorescence intensity

40. Reports of an influenza outbreak in the fall on 2003 are alarming due to the high attack rate (extraordinary numbers of cases) and high mortality rate. Which of the following best explains this scenario?

    A. Antigenic drift in influenza type A virus has occurred.
    B. Hemophilus influenzae strains have become resistant to all available antibiotics.
    C. Influenza virus type A virus has acquired new genetic material from animal hosts.
    D. Influenza virus type B fevers treated with new generation anti-pyretics have caused re-emergence of Reye syndrome.
    E. Influenza virus type C fevers treated with new generation anti-pyretics have caused re-emergence of Reye syndrome.

41. A 20-month-old child is brought to the emergency room by her mother, who states the child had a cold, developed a fever 2 days ago, and has been crying for 5 hours. When taking a history you discover the child has received no vaccinations due to parental concerns about vaccination safety, but has been healthy until this illness. Examination reveals increased crying with neck flexion, and dull red tympanic membranes. A lumbar puncture is performed and numerous neutrophils are reported in the cerebrospinal fluid. Which of the following is the best explanation of this case?

    A. Adenovirus infection of middle ears with secondary meningitis.
    B. Influenza type B infection followed by meningoencephalitis.
    C. Influenza type A infection followed by Reye syndrome
    D. Rhinovirus infection followed by Hemophilus influenzae type B middle ear infection leading to bacterial meningitis.
    E. Rhinovirus infection followed by viral meningoencephalitis.

GO TO THE NEXT PAGE

42. You are scrubbed in for a left lower lobectomy for squamous cell carcinoma arising in the bronchus. Lymph nodes sent for frozen section are reported back from pathology as showing a partially calcified granuloma, but no tumor. Your resident then proceeds with the lobectomy, giving the specimen to you to take to Pathology for a frozen section on the bronchial margin. The resident tells you to ask about a 2 mm hard nodule visible beneath the pleura. You tell him that nodule is just

    A. a Ghon focus
    B. healed histoplasmosis
    C. either an old Ghon focus or healed histoplasmosis
    D. a focus of gummatous necrosis
    E. a typhoid nodule

43. A 3-year-old child is brought to the emergency room with a 2-day history of vomiting and diarrhea, and shows signs of volume depletion. Which of the following is the most likely etiologic agent?

    A. Adenovirus
    B. Cytomegalovirus
    C. Paramyxovirus
    D. Rhinovirus
    E. Rotavirus

44. In the late 1800's a viral illness devastated the population of Memphis, Tennessee. In the outbreak of 1878, 5200 deaths occurred out of a residual population of 19,600. Those brave enough to remain to care for the sick noted fever, headache, nausea and vomiting were seen in virtually all patients, and that once jaundice and bleeding appeared, death was often imminent.
    The disease was

    A. Diphtheria
    B. Malaria
    C. Q fever
    D. Typhoid fever
    E. Yellow fever

45. Outbreaks of the above disease (question # 44) no longer occur in the Southeast USA due to

    A. control of rodent populations
    B. drainage of wetlands and other mosquito control measures
    C. availability of broad-spectrum antibiotics
    D. improved personal and home sanitation standards
    E. vaccination programs

46. A 63-year-old patient being treated for breast carcinoma develops painful vesicular skin lesions extending from the right upper paraspinal region, around the right side to near the sternum. Which of the following is true?

    A. The patient previously had chicken pox.
    B. The patient has shingles.
    C. The patient has a viral disease.
    D. The initial infection is usually benign, but rarely can cause encephalitis or pneumonia.
    E. All of the above are true.

GO TO THE NEXT PAGE

47. Which of the following is **TRUE** regarding the pathogenesis of syphilitic aortitis with aneurysm formation?

    A. Central nervous system destruction by spirochetes leads to a loss of vascular tension and aortic dilatation.
    B. Gumma formation in adrenal glands leads to hypertension and dissecting aortic aneurysms.
    C. Condyloma lata weakens the aorta resulting in aneurysmal dilatation.
    D. Obliterative endarteritis of the vasa vasorum leads to necrosis and weakening of the aortic media.
    E. Tabes dorsalis damages the aortic ring, leading to thoracic aneurysms.

48. A chest radiograph on a 67-year-old male shows an apical cavitary lesion. Of the following, the most likely etiologic organism is

    A. Bordetella pertussis
    B. Hemophilus influenzae
    C. Legionella pneumophila
    D. Mycobacterium tuberculosis
    E. Streptococcus pneumoniae

49. Which of the following infections is most closely associated with patients in diabetic ketoacidosis?

    A. Cytomegalovirus hepatitis
    B. Diphtheria
    C. Dysentery
    D. Mucormycosis of paranasal sinuses
    E. Staphylococcal pneumonia

50. A healthy 27-year-old female who has been in labor for 36 hours develops severe shortness of breath. A healthy term male infant is delivered by emergency cesarean section, but the mother expires. The most likely autopsy findings that relate to this history would be

    A. normal heart, amniotic fluid embolism seen as fetal squamous cells in pulmonary arteries
    B. normal heart, paradoxical embolism, splenic infarcts
    C. normal heart, thromboemboli in pulmonary veins
    D. placental infarcts secondary to aortic atherosclerosis
    E. venous thrombi in pelvic veins with thromboemboli in pulmonary veins

51. The right renal artery contains an atherosclerotic plaque that ulcerates and fragments, with atheromatous and thrombotic material embolizing distally. The renal lesion produced is an example of

    A. caseous necrosis
    B. coagulative necrosis
    C. fat embolism
    D. liquefactive necrosis
    E. paradoxical embolism

GO TO THE NEXT PAGE

52. A 67-year-old female hospitalized for treatment of congestive heart failure develops a sudden worsening of pulmonary functions. Her oxygen is increased and she is stabilized. A chest radiograph 3 days later reveals a wedge-shaped density indicating the presence of a pulmonary infarct. Without a change in management, the most serious problem facing this patient is the potential for

    A. cerebral thromboembolism and infarction
    B. cerebral hemorrhage
    C. liver congestion
    D. renal ischemia and anuria
    E. sudden death due to massive thromboembolism

53. For a deep venous thrombosis in the leg to result in a cerebral infarct there must be a lesion in

    A. the aorta
    B. the heart
    C. the liver
    D. the lung
    E. the kidney

Match the items in the left column with the best answer from the right column.

54. Myocardial infarction	A.	Coagulative necrosis
55. Saponifications	B.	Liquefactive necrosis
56. Maintenance of basic tissue structure	C.	Caseous necrosis
57. Abscess	D.	Fat necrosis
58. Cerebral infarct		

Match the following items in the left column with chronological order they occur located in the right column.

59. Rolling of neutrophils on the endothelium	A.	Occurs first
60. Infiltration of monocytes/macrophages	B.	Occurs second
61. Transmigration of neutrophils	C.	Occurs third
62. Vasodilation of local venules	D.	Occurs fourth

Match the following items in left column with the best answer from the right column.

63. Increased endometrial glandular tissue with estrogen producing tumor	A.	physiologic hyperplasia
64. increase in left ventricular mass due to hypertension	B.	pathologic hyperplasia
65. skeletal muscle of weight lifter	C.	physiologic hypertrophy
	D.	pathologic hypertrophy
	E.	physiologic atrophy

Match the following items with their best response.

66. PDGF	A.	Stimulates extracellular matrix degeneration by metalloproteinases
67. TIMPs	B.	Inhibits extracellular matrix degeneration by metalloproteinases
68. Steroids		

GO TO THE NEXT PAGE

MATCH:

69. subendothelial electron dense deposits
70. hemodialysis-associated amyloidosis
71. drug-induced lupus erythematosus
72. Wegener's granulomatosis
73. affect leukocyte movement

A. anti-histone autoantibodies
B. anti-neutrophil cytoplasmic antibodies (ANCA)
C. "wire loop" lesion
D. β_2 microglobulin
E. chemokines

Match the following (Each may be used once, more than once, or not at all.).

74. Destructive bronchopneumonia with abscess formation
75. Rheumatic fever
76. Immune complex glomerulonephritis

A. Staphylococcus aureus
B. Group A beta hemolytic streptococci
C. Group B streptococci
D. Group D streptococci

Match the following.

77. Cholera
78. Suicide attempt by cutting wrists
79. Ruptured appendix
80. Massive myocardial infarct

A. cardiogenic shock
B. hypovolemic shock
C. septic shock

STUDENT SCORE REPORT

NAME: ID NUMBER: [redacted] INDIVIDUAL SCORE: 69 86.25%

QUESTION NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
INCORRECT RESPONSE		X													X														X											
YOUR ANSWER	C	E	E	E	A	A	E	B	D	B	A	A	B	C	B	E	B	E	E	B	A	D	C	B	D	D	B	A	A	B	B	D	A	C	C	A	E	B	B	C
CORRECT ANSWER	C	B	E	E	A	A	E	B	D	B	A	A	B	C	B	E	B	E	A	B	A	D	C	B	D	D	B	A	A	B	B	C	A	C	C	A	E	B	B	C

QUESTION NUMBER	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
INCORRECT RESPONSE				X	X	X	X				X				X	X	X																							
YOUR ANSWER	B	E	B	A	D	A	B	B	A	C	B	D	B	D	C	A	B	A	C	D	A	B	E	B	D	A	B	B	C	A										
CORRECT ANSWER	B	E	B	A	D	A	B	B	B	D	C	A	B	D	C	A	B	B	C	D	A	B	E	A	B	B	B	B	C	A										

O...ITEM OMITTED FROM TEST AND STATISTICS
*...ALL STUDENTS GIVEN CREDIT FOR THIS ITEM