

PATHOLOGY EXAM #2
October 23, 2000

Practical Questions:

Directions: Case Clusters: Following the brief clinical history, for each of the numbered questions concerning the case, select one lettered option that is MOST APPROPRIATE.

NOTE: Questions 1 through 4 use the same slide.

A 42 -year-old man, who had led a homosexual lifestyle, presented in a clinic with his CD4+/-CD8+ T cell ratio reversed, had 150 CD4+ T cells/ μ L, and he was HIV positive. He subsequently developed Kaposi's sarcoma and Died within 6 months.

1. To be consistent with a diagnosis of AIDS according the present CDC definition this patient's CD4+ T cell count had to be which of the following?
 - A. 0/ μ L
 - B. <50/ μ L
 - C. <100/ μ L
 - D. <150/ μ L
 - E. <200/ μ L

2. In general, the HIV virus strain that has caused the worldwide pandemic of AIDS is designated as:
 - A. HIV-1 Group M
 - B. HIV-1 Group O
 - C. HIV-2 Group M
 - D. HIV-2 Group O
 - E. HIV-SIV

3. Kaposi's sarcoma, the cause of death in this individual is now recognized to be caused by:

- A. Cytomegalovirus
- B. Epstein-Barr virus
- C. Herpesvirus
- D. Human immunodeficiency virus
- E. Rhabdovirus

4. Most AIDS patients develop, during the course of the disease, neurological manifestations. HIV is carried to the brain by:

- A. CD4+ T cells
- B. CD8+ T cells
- C. Erythrocytes
- D. Macrophages
- E. Microglial cells

MATCHING: the following pertain to questions 5 and 6 and refer to Figure 8-26 from the Robbin's text. You may use an answer once, more than once, or not at all.

- A. CDKs
- B. Rb
- C. G₁
- D. Cyclin D
- E. Cyclin B

5. A This protein(s) is (are) constitutively expressed during the cell cycle

6. B Phosphorylation of this protein leads to the activation of several genes critical for S phase

7. A 60 year-old male with a long history of smoking presented with hemoptysis and dyspnea. Chest X-ray revealed a lung mass, which was biopsied. This slide is representative of the tumor. Based solely on the histologic features in this slide, is this tumor most likely benign or malignant?

- A. Benign
- B. Malignant

NOTE: The following clinical history pertains to questions 8 through 10. You may refer to the coagulation diagram on the following page.

You are asked to evaluate an 18 year-old female who is scheduled for an elective outpatient breast augmentation surgery. On physical examination, you notice that her oral mucosa exhibits multiple petechial hemorrhages. She is otherwise asymptomatic.

8. The first laboratory study you should order is:

- A. Platelet aggregation studies
- B. Platelet count
- C. Coagulation Factor assays
- D. Ivey Bleeding time

9. The laboratory study which you should absolutely not order first is:

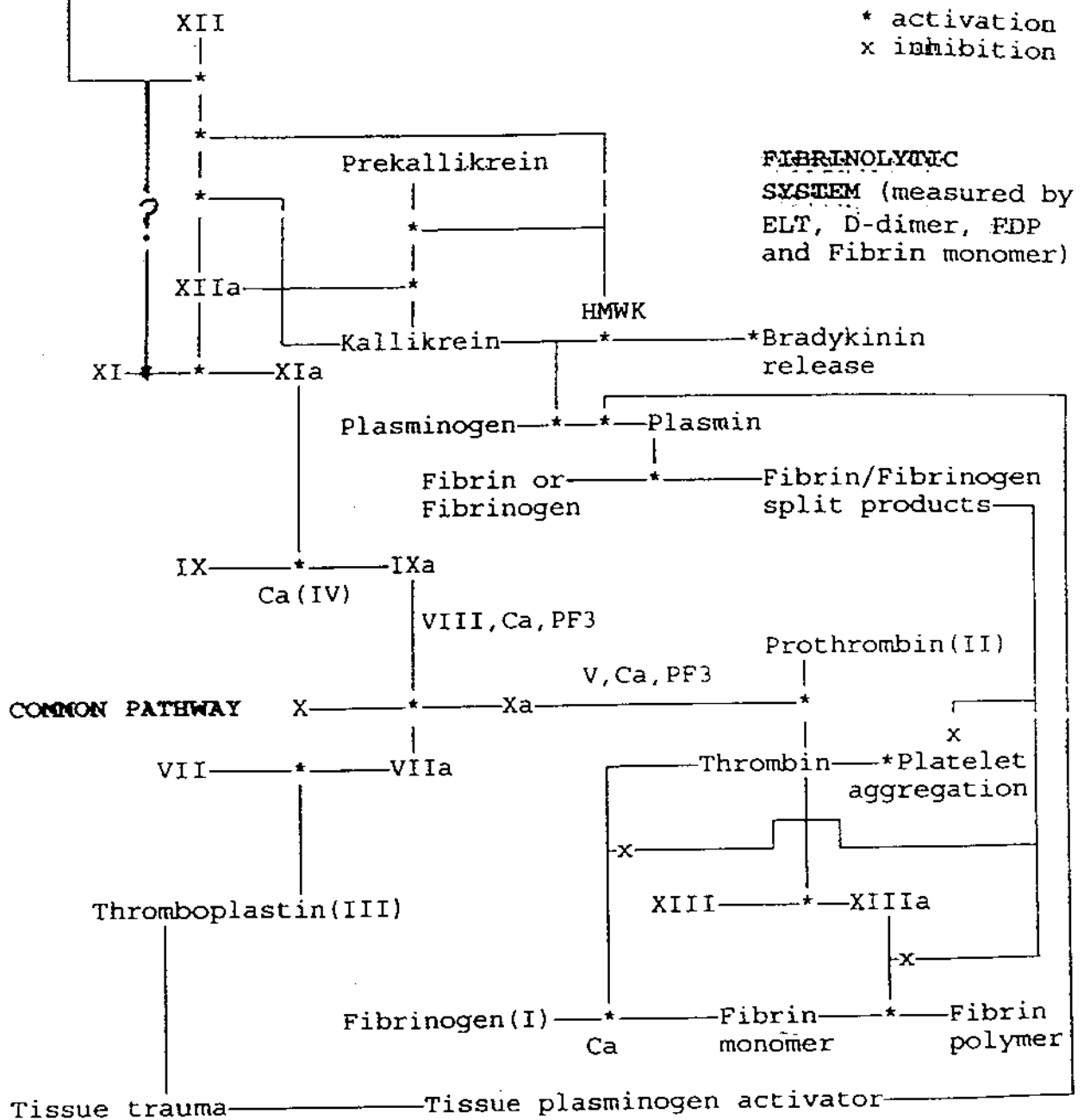
- accept all*
- A. Platelet aggregation studies
 - B. Platelet count
 - C. Coagulation Factor assays
 - D. Ivey Bleeding time

10. You find that her PT and aPTT are both prolonged. The least likely cause of this finding is:

- A. Factor X deficiency
- B. Vitamin K deficiency
- C. Factor XIII deficiency
- D. Hypoprothrombinemia (factor II deficiency)

INTRINSIC PATHWAY

Surface contact (collagen, activated platelets)



EXTRINSIC PATHWAY

* activation x inhibition

Contact factors: XII, XI, HMWK, C1' inhibitor, prekallikrein
 Serine proteases: kallikrein, XIIa, XIa, Xa, IXa, VIIa, thrombin
 Vitamin K dependent factors: II, VI, IX, X
 HMWK: high molecular weight kininogen
 Ca: factor IV (calcium)
 PF3: platelet factor 3 (phospholipid)

Written Questions:

EXTENDED-MATCHING SETS: The following pertain to questions 11 through 18. Each group of items in this section consists of lettered options followed by a set of numbered items. For each item, select one lettered option that is most closely associated with it. Each lettered option may be selected once, more than once, or not at all.

- A. Ag-Ab complex-induced vasculitis + T cell-mediated inflammation
- B. Antibody-dependent cell-mediated cytotoxicity
- C. Antibody-induced overstimulated glutamate receptor
- D. Anti-acetylcholinesterase receptor antibodies
- E. Anticonnective component antibodies
- F. Erythrolysis from complement-mediated Ab-induced cytotoxicity
- G. Granulomatous disease from cell-mediated hypersensitivity
- H. IgE mediated mast cell activation and degranulation
- I. Immune complex disease with Anti-IgG antibody
- J. Natural killer cell cellular cytotoxicity hypersensitivity

For each patient match the mechanism of pathogenesis with the disease.

11. **I** A 55-year-old female from Lubbock diagnosed with rheumatoid arthritis.

12. **H** A 28-year-old housewife from Lubbock with hay fever.

13. **G** A 45-year-old Russian immigrant with tuberculosis.

14. **F** An El Paso infant with Rh-factor incompatibility.

15. **C** A 6-year-old girl with multiple daily seizures from Rasmussen's encephalitis.

A 16. **J** Graft rejection in a kidney transplant patient.

17. **D** A 27-year-old pregnant woman with myasthenia gravis

E 18. **A** A cigarette smoker with bloody cough and nephritis from Goodpasture's disease

EXTENDED-MATCHING SETS: The following pertain to questions 19 through 26. Each group of items in this section consists of lettered options followed by a set of numbered items. For each item, select one lettered option that is most closely associated with it. Each lettered option may be selected once, more than once, or not at all.

- A. Acute graft-versus-host disease
- B. Arthus reaction with fibrinoid necrosis
- C. Common variable immunodeficiency disease
- D. Reactive (secondary) systemic amyloidosis
- E. Serum sickness with multiple sites of acute necrotizing vasculitis
- F. Severe combined immunodeficiency disease
- G. Shögren's syndrome
- H. Systemic lupus erythematosus
- I. Systemic sclerosis
- J. X-linked agammaglobulinemia of Bruton

For patients with the following clinical symptoms,, give the most likely diagnosis.

- H 19. ~~I~~ Hematoxylin bodies, anti-dsDNA and anti-SM antigens
20. ~~C~~ Dry eyes, dry mouth, rheumatoid arthritis, anti-SS-A,B antigens
21. ~~I~~CREST syndrome
22. ~~D~~ Chronic inflammatory disease, AA protein
23. ~~B~~ Injection site soreness following immunization
24. ~~F~~ No T cells, functionally impaired B cells, severe hypogammaglobulinemia, thymic dysplasia, death at < 1-year-old from recurrent opportunistic infections
25. ~~C~~ T cells and thymus normal, functionally-impaired B cells, hyperplastic spleen and lymph nodes, hypogammaglobulinemia, recurrent pyogenic infections in a 3 -year-old boy
26. ~~A~~ Dermatitis, diarrhea, and jaundice following bone marrow transplant in a malignant lymphoma patient.

27. A 28 year-old female undergoes colposcopy and biopsy of her cervix due to a previous abnormal pap smear. The biopsy reveals atypical cells extending through the full thickness of the ectocervical epithelium from the basal layer to the surface. These atypical cells have high nuclear/cytoplasmic ratios, hyperchromatic irregular nuclei, and high mitotic rates. The atypical cells have not invaded the underlying basement membrane. The best diagnosis for this biopsy is:

- A. Squamous cell carcinoma in-situ
- B. Well-differentiated squamous cell carcinoma
- C. Poorly-differentiated squamous cell carcinoma
- D. Well-differentiated adenocarcinoma
- E. Poorly-differentiated adenocarcinoma

28. A 50 year-old female has a palpable mass in the upper outer quadrant of her breast. A biopsy is performed, revealing breast carcinoma. Which of the following items is NOT relevant in determining the stage of her tumor?

- A. The size of the tumor
- B. Whether or not it invades surrounding structures, such as the chest wall
- C. Whether or not it has extended to axillary lymph nodes
- D. Whether or not it has metastasized to distant sites
- E. How well-differentiated the tumor is

MATCHING: the following pertain to questions 29 through 32. You may use an answer once, more than once, or not at all.

- A. Autosomal dominant inherited cancer syndrome
- B. Familial cancer syndrome
- C. Autosomal recessive defective DNA repair syndromes
- D. Acquired preneoplastic disorders
- E. Acquired DNA damage from chemicals, radiation or viruses

A 29. Inherited predisposition to cancer characterized by a marker phenotype B

A 30. Familial adenomatous polyposis of the colon is an example B

31. Genetic mutations in BRCA-1 and BRCA-2 are associated with this syndrome B

32. Bloom syndrome is an example C

MATCHING: the following pertain to questions 33 and 34. You may use an answer once, more than once, or not at all.

- A. Growth factor
- B. Growth factor receptor
- C. Signal-transducing protein
- D. Nuclear transcription proteins
- E. Cyclins and cyclin-dependent kinases

33. The product of the *ras* oncogene is an example C

B 34. *Erb-B2* is an example D

35. Major influences of thrombogenesis include all of the following except:

- A. Altered blood flow
- B. Endothelial injury
- C. Altered coagulability
- D. Systemic fibrinolysis

36. Disseminated Intravascular Coagulation (DIC) represents:

- A. A secondary abnormality resulting in consumptive coagulopathy, microangiopathic hemolysis, systemic fibrin(ogen)olysis and a bleeding diathesis
- ~~B. Systemic activation of the coagulation and fibrinolytic systems by circulating Fibrin(ogen) Degredation Products (FDP)~~
- ~~C. An inherited abnormality resulting in deep vein thrombosis~~
- ~~D. A primary abnormality resulting in systemic clotting within the microvasculature~~

37. Anemic infarcts

- A. Form as the result of severe anemia
- B. Form as the result of venous occlusions
- C. Form as the result of arterial occlusions
- D. Form as the result of pulmonary emboli

38. The first hemostatic response (primary hemostasis) to exposure of subendothelial connective tissue to the blood stream is:
- A. Platelet aggregation
 - B. Activation of factor XII
 - C. Platelet adhesion
 - D. Activation of fibrin(-ogen)olysis
 - E. None of the above
39. In the process of platelet adhesion, von Willebrand factor acts as:
- A. A catalyst in crosslinking of fibrin monomers
 - B. A molecular bridge between platelets and collagen
 - C. A trigger for the release reaction
 - D. A molecular bridge between aggregating platelets
 - E. A stimulator of fibrinolysis
40. Ischemic damage in survivors of shock may result in:
- A. Adult respiratory distress syndrome
 - B. Hypoxic encephalopathy
 - C. Acute tubular necrosis
 - D. Susceptibility to infection
 - E. All of the above

EXTENDED-MATCHING SETS: The following pertain to questions 41 through 50. Each group of items in this section consists of lettered options followed by a set of numbered items. For each item, select one lettered option that is most closely associated with it. Each lettered option may be selected once, more than once, or not at all.

- A. Chronic passive congestion
- B. Ascites
- C. Anasarca
- D. Thromboembolism
- E. Transudate
- F. Edema
- G. Brawny edema
- H. Elephantiasis
- I. Petechiae
- J. Hemarthrosis

41. H A cause of inflammatory lymphedema

C 42. F Generalized swelling of organs and tissues as seen with nephrotic syndrome

43. B A complication of hepatic cirrhosis due to increased intravascular hydrostatic pressure secondary to portal hypertension and decreased protein synthesis

accept all 44. F A complication of radiation therapy following radical breast surgery

45. J Most suggestive of coagulation factor related bleeding

46. I Most suggestive of platelet related bleeding

47. E Inflammatory, protein-rich effusion

48. A Long-standing passive hyperemia leading to hypoxia and parenchymal injury

49. F An imbalance between intravascular hydrostatic pressure and colloid osmotic pressure

50. D Fragmented portion of a clotted mass of blood within the noninterrupted cardiovascular system