1. Neutrophil kinetics: What is incorrect?
A. A normal man produces around 70 billion neutrophils per day.
B. If you shake someone really hard you could dramatically ↑ their WBC count
C. Neutrophil production is sensitive to low levels of B12/folate
D. African americans typically have slightly higher WBC count than caucasians

2. How would you tell a Thalassemia from an iron deficiency anemia?
A. Blood smear
B. Retic Count
C. Serum Iron
D. Erythropoietin

3. Which patients would likely have ↓ serum iron?
A. A patient with a known defect in the HFE gene
B. A patient with thalassemia
C. A hemophiliac who has received multiple transfusions
D. A patient with marrow damage anemia
E. A patient with a positive Guaic test

4. What is untrue about Von Willebrand's disease?
A. VW disease can manifest as abnormally high levels of Ultra-Large vWF (ULvWF) due to lack of a protease
B. Is more common than hemophelia
C. prolonged bleeding time
D. A VW patient may bleed like a patient with hemophilia because factor VIII survival time is reduced
E. Prolonged PTT

5. A man with Von Willebrand's disease marries a healthy woman. They have two boys. What is the closest estimate of the chance that both boys will have the disease?
A. 5%
B. 11%
C. 23%
D. 98%
E. Depends on if the mother is a carrier, which we don't know

6. What is prothrombotic?
A. Thrombomodulin
B. Prostacyclin
C. Activated Protein C
D. Collagen
E. Plasmin

7. What is the best test to determine if a patient has intravascular thrombi?
A. D-Dimer
B. Bleeding time
C. Directly measure fibrin concentration
D. PTT
E. PT

Mix and Match: Testing.
A. bleeding time
B. partial thromboplastic time (PTT)
C. prothrombin time (PT)
D. thrombin time (TT)

8. platelet quantity & function
9. fibrinogen quantity & function
10. Hemophilia shows this test prolonged
11. Gets prolonged first with Coumadin (Warfarin)

12. What is a good treatment for a Hemophiliac with a factor VIII of 5%?
A. plasma transfusion as needed
B. platelet transfusion as needed
C. DDAVP as needed
D. Vitamin K as needed

13. What does not raise vWF levels?
A. estrogen
B. pregnancy
C. DDAVP
D. tranexamic acid
E. ristocetin

14. What is not a cause of hypercalcemia seen in patients with an underlying malignancy?
A. Acute Tumor Lysis syndrome due to lysis of malignant cells
B. Pathyroid hormone related protein seen in squamous cell cancer
C. Local osteolysis by malignant-cell-released mediators
D. Production of 1,25(OH)2 (Vitamin D3) in hodgkin's and non-hodgkin's lymphoma

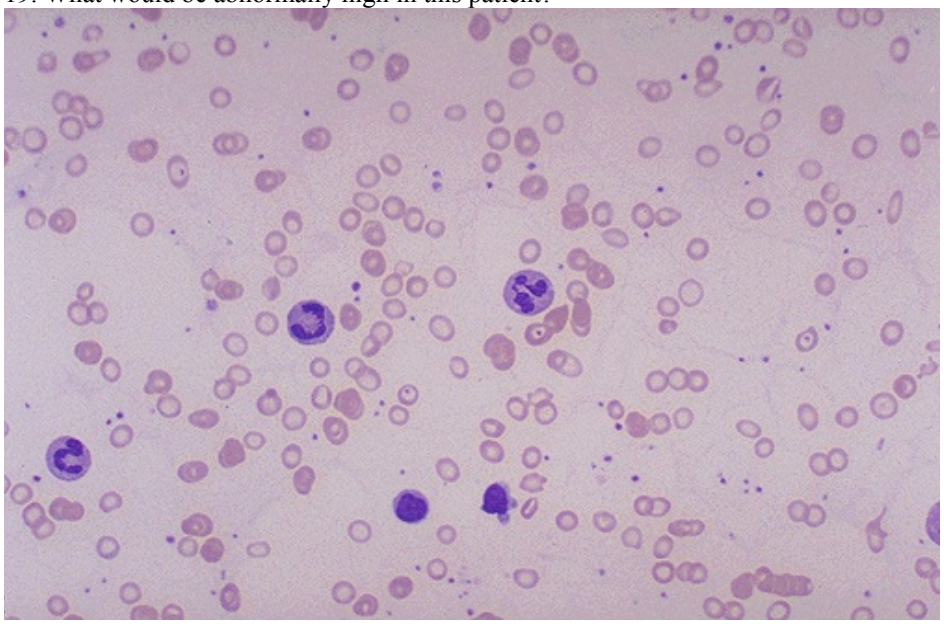
15. A woman with a history of abnormally heavy menstrual bleeding and bleeding gums when flossing comes to you for evaluation. The following tests are normal: bleeding time, FVIII activity, von willbrand antigen, and the ristocetin cofactor activity. The PTT is prolonged. What is the next step in evaluation?
A. Tell her that some people bleed more than others when menstruating and that bleeding gums can be controlled by regular dental visits.
B. Make a tentative diagnosis of Hemophilia, and make an appointment to directly measure her Factor IX levels.
C. Tell her to come back in two weeks to repeat all the tests
D. Screen her for a mutation in ADAMTS13 gene.

16. A patient with neutropenic enterocolitis has watery diarrhea, abdominal pain, distension. What is the recommended treatment?
A. Exploratory endoscopy
B. Emergency surgery
C. Barium studies
D. Antibiotics and bowel rest

17. A patient presents with extremely engorged jugular and upper extremity veins. A chest X-ray shows a mediastinal mass. What is the most likely diagnosis and treatment?
A. diagnosis: either lymphoma or non-small-cell lung cancer; treatment: biopsy of mass
B. diagnosis: either lymphoma or small-cell lung cancer; treatment: biopsy of mass
C. diagnosis: either lymphoma or non-small-cell lung cancer; treatment: depends on diagnosis
D. diagnosis: either lymphoma or small-cell lung cancer; treatment: depends on diagnosis

18. What is not seen in Acute Tumor Lysis Syndrome?
A. hyperuricemia
B. hypercalcemia
C. hyperkalemia
D. hyperphosphatemia
E. increased LDH

19. What would be abnormally high in this patient?

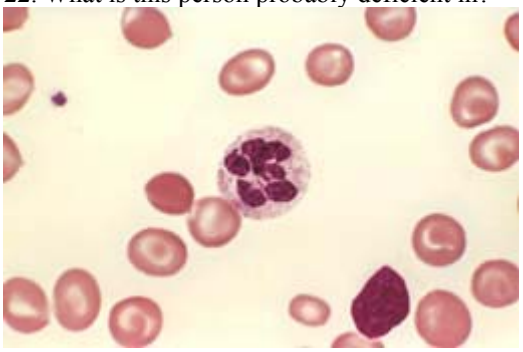


A. Serum Iron
B. Ferritin
C. Transferrin
D. Serum Iron/Transferrin
E. B12 or Folate

20. What is associated with the earliest stage of anemia of chronic disease?
A. a microcytic, low retic anemia
B. erythropoeietin resitance
C. a synergestic effect between cytokines and RBC production
D. iron utilization problems

21. What would you see in someone with 2 alpha-hemoglobin genes missing?
A. A different pattern of hemoglobin electrophoresis compared to normal
B. A severe anemia
C. gamma-4 (barts) and beta-4 (HbH) hemoglobin
D. hydrops fatalis
E. None of the above

22. What is this person probably deficient in?



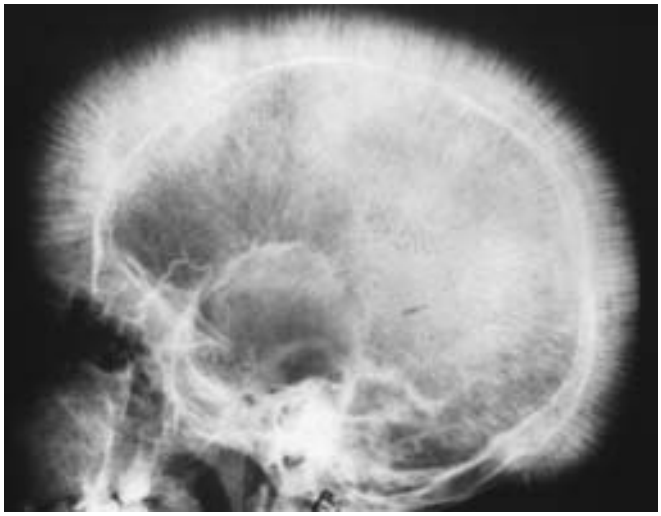
A. Iron
B. B12 or Folate
C. G6PD
D. The patient is probably not deficient anything but has suffered a severe chloramphenical exposure
E. Hemoglobin beta

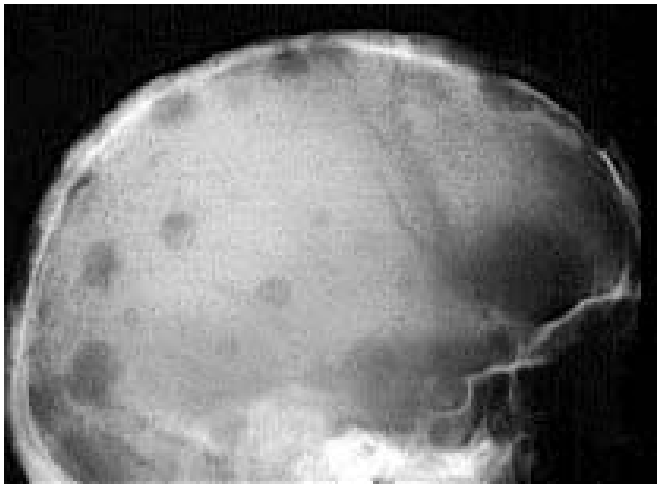
23. A patient comes to you for anemia, and you work them up nicely, even giving them a digital rectal examination which came out normal. Their creatinine, iron, B12, folate, are all normal. Their retic count is 0.5%. What could not have caused their anemia?
A. Drug Toxicity
B. Radiation
C. Benzene
D. Miliary TB
E. Parvovirus B19
F. Malignancy
G. Autoantibodies to RBCs

24. What does the direct Coomb's test measure?
A. anti-RBC antibodies in a patient's serum
B. antibodies stuck on a patient's red cells
C. the osmotic fragility of a patient's red cells
D. antibodies to intrinsic factor

Mix and Match: Skull X-Rays

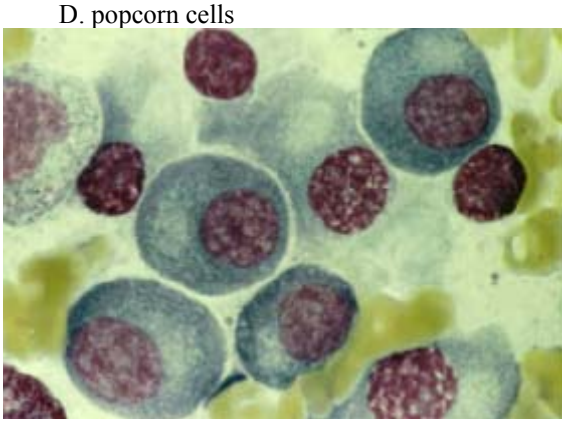
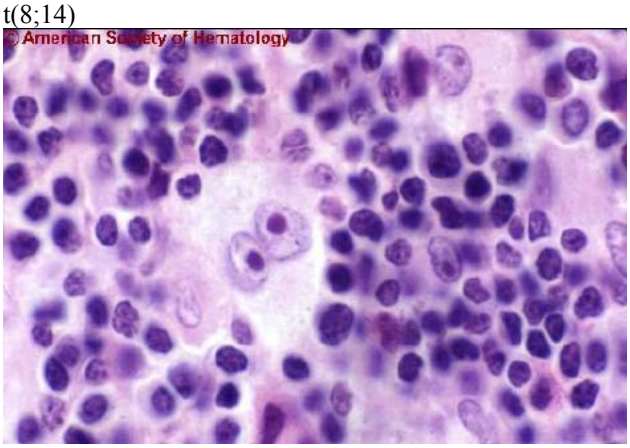
A. Metastatic cancer to skull
B. Thalassemia
C. Lytic lesions characteristic of multiple myeloma
D. Metastatic cancer to brain

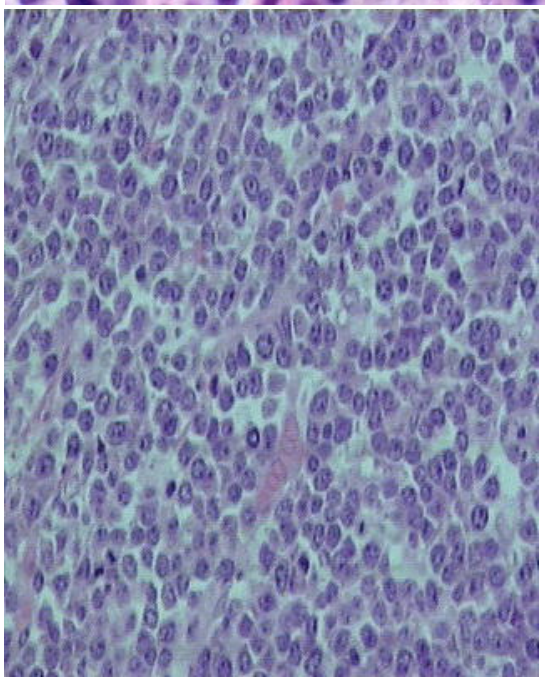
25. 

26. 

Mix and match: funny names of things that will kill you: items may be used more than once, etc.

A. fried egg
B. starry sky
C. owl eyes
D. popcorn cells

27. 
28. hodgkin's disease
29. lymphocte predomint hodgkin's lymphoma
30. myc oncogene translocation
31. Reed-sternberg cells
32. Immunoglobin "M-spike" seen in serum
33. t(8;14)
34. 

35. 

36. When would you consider a stem cell transplant for a patient with hodgkin's disease?
A. only in stage I or IIA since they are the healthiest
B. only in stage IIIB and IV since they are the sickest
C. only after chemotherapy and radiation are ineffective
D. only for patients over age 70

37. Follicular (B-cell) NHL, Burkitt's, and Mantle cell lymphoma all involve translocations from one gene or another to the immunoglobin locus. What chromosome is common among all translocations?
A. 8
B. 14
C. 11
D. 18
E. 24

38. What does modern treatment of Multiple Myeloma rely on?
A. Stem cell transplant
B. Targetted antibodies
C. Targetted radiation
D. Chemotherapy
E. Diffuse radiation

39. What information would you not use in diagnosing essential thrombocytosis?
A. Thrombopoietin levels
B. Platelet levels
C. History of thrombotic event
D. History of increased bleeding

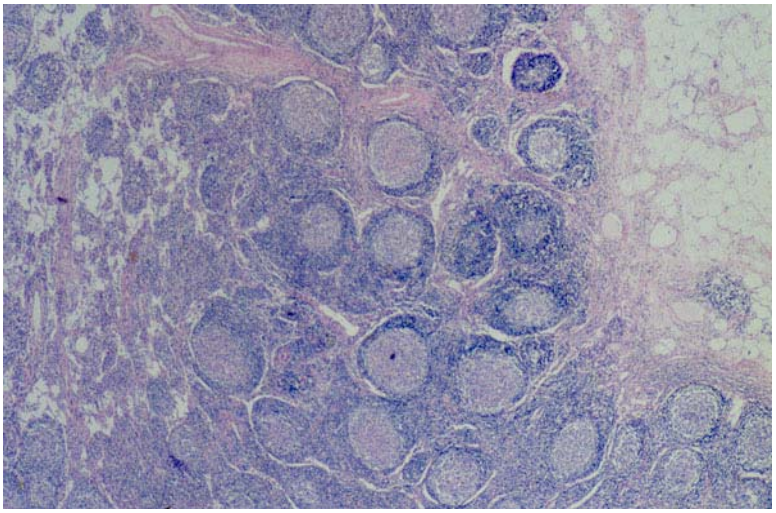
Mix and match: Translocations
A. t(8;14)
B. t(9;22)
C. t(15;17)
40. chronic myeloid leukemia
41. Acute Promyelocytic Leukemia
42. Can be essentially "cured" with all-trans retinoic acid
43. Monomorphic B-cell disease

44. The following is an example of:

A. MDS
B. MPS
C. Iron deficiency
D. membrane structural defect
E. polycythemia

45. A 14 year old boy has leukemia. What does he probably have?
A. ALL
B. ANLL
C. CML
D. CLL

46. What is not true about this disease?



A. this is an aggressive, malignant disease with a poor prognosis
B. comprises of about 30% of non hodgkin's lymphomas
C. often involves a translocation of the BCL-2 oncogene to the Ig locus
D. most patients present with disseminated disease at diagnosis

Mix and Match: Breast cancer therapies
A. tamoxifen
B. herceptin (trastuzumab)
C. rhuMAB
47. Ineffective against cancers that don't express estrogen receptor
48. Monoclonal antibody that blocks receptor tyrosine kinase activity

49. What is not true about lung cancer?
A. most are non-small cell cancers
B. a stage IIIB NSCLC can be extremely malignant if a malignant effusion is present
C. small cell lung cancers are staged I-IV
D. it is not routine to operate on small cell lung cancers

50. What is true about esophageal cancer?
A. Squamous cell carcinoma, associated with alcohol, is rising in incidence
B. Adenocarcinoma, associated with barrett's esophagis, is falling in incidence
C. Has greater than 90% fatality rate
D. Combined therapy (surgery + radiation) shows a clear benefit to either alone

Mix and match: tumor markers
A. Ca19-9
B. CEA
C. a protein product of the human kallikrein gene
D. CA-125
E. human chorianoic gonadotropin and alpha feto-protein
51. midline tumors of unknown primary
52. This cancer is the fourth leading cancer killer in US: low incidence but high mortality
53. BRCA gene mutation predisposes towards
54. #1 cancer in men, but not the #1 cancer killer
55. A type of cancer that metastasizes first to the liver and shows a genetic link in about 15% of all cases

ANSWERS

1. D
2. C
3. E
4. A
5. C
6. D
7. A
8. A
9. D
10. B
11. C
12. C
13. E
14. A
15. C
16. D
17. D
18. B
19. C (iron deficiency hypochromatic smear)
20. B
21. E
22. B (key feature: hypersegmented neutrophil)
23. G
24. B
25. B
26. C
27. A
28. C
29. D
30. B
31. C
32. A
33. B
34. C
35. B
36. C
37. B
38. A
39. A
40. B
41. C
42. C
43. A
44. A (ringed sideroblasts)
45. A
46. A (follicular lymphoma)
47. A
48. B
49. C
50. C
51. E (testicular cancer)
52. A (pancreatic cancer)
53. D (ovarian cancer)
54. C (prostate cancer)
55. B (colorectal cancer)
56. A

Bonus question:

56. What would shift the hemoglobin oxygen-dissociation curve to the left?
A. decrease in 2,3-DPG
B. Methemoglobinemia
C. metabolic acidosis
D. increase in temperature