1. Which cell changes are typical of B12 or folate deficiency anaemia
    a. MCV low, RDW high, Reticulocyte count high
    b. MCV normal, RDW normal, Reticulocyte count high
    c. MCV high, RDW high, Reticulocyte count normal
    d. MCV high, RDW normal, Reticulocyte count normal

2. Which is **not** a cause of microcytic anaemia
    a. Siderblastic
    b. Thalassemia
    c. Chronic disease
    d. Drug induced

3. Which condition is more likely to be due to a platelet disorder
    a. Delayed bleeding
    b. Ecchymoses
    c. Retroperitoneal bleeding
    d. Intra-articular bleeding

4. Which is an acquired hypercoagulable disorder
    a. Antiphospholipid syndrome
    b. Factor V Leiden
    c. Protein C and S deficiency
    d. Hyperhomocysteinemia

5. Which is **not** a microangiopathic haemolytic anaemia
    a. ITP
    b. TTP
    c. HUS
    d. HELLP

6. Regarding ITP which is true
    a. It frequently remits spontaneously in adults
    b. Peak incidence in children is at 15 years of age
    c. Children with platelet counts of >30,000/mm3 do not require treatment
    d. The circulating platelets function abnormally

7. Regarding TTP which is **incorrect**
    a. It is associated with a deficiency of enzyme ADAMTS 13
    b. Males are affected twice as commonly as females
    c. CNS symptoms differentiate it from HUS
    d. Plasma exchange is the mainstay of treatment

8. In HUS which is correct
    a. It is the most common cause of AKI in children < 5 years old
    b. Commonly affects liver and kidney
    c. Shigella is the most common infectious cause
    d. Antibiotics should be routinely given if diagnosis is suspected to decrease severity and duration of disease

9. Regarding Haemophilia which is true
    a. The APTT and INR in haemophilia will be raised
    b. Factor replacement should be commenced before or simultaneous to resuscitation even in airway or head trauma
    c. If no signs of haemarthrosis are present pain is not a reliable indicator of bleeding into a joint for a haemophiliac
    d. Moderate disease means factor activity levels between 5 to 40%

10. In patients with von Willebrand's disease
    a. FFP can be used to treat bleeding as it contains both factor X and vWF
    b. Desmopressin can be given IV, SC or intranasal
    c. NSAIDs can be used with no adverse effects
    d. Type I is more severe than types II and III

11. Which is not a complication of sickle cell vaso-occlusive crisis
    a. Avascular necrosis of femoral head
    b. Priapism
    c. Pulmonary infarction
    d. Desquamation of the Skin

12. In G6PD deficiency which statement is **not** true
    a. Males are predominantly affected as it is X linked
    b. Neonatal jaundice is a potential complication
    c. Bier's block is a relative contraindication in patients with G6PD deficiency
    d. Methylene blue should be avoided in patients with G6PD deficiency as it is ineffective and may induce haemolysis

13. In transfusion reaction what would be the expected blood test results
    a. High serum haptoglobin, high LDH, haemoglobinuria, Coombs test positive
    b. High serum haptoglobin, low LDH, DIC, Coombs test negative
    c. Low serum haptoglobin, high LDH, haemoglobinuria, Coombs test positive
    d. Low serum haptoglobin, low LDH, DIC, Coombs test positive

14. Regarding Heparin induced thrombocytopaenia HIT which is true
    a. Low BMI is a risk factor
    b. Warfarin can be a viable substitute for heparin in HIT syndrome
    c. HIT syndrome is not possible without previous heparin exposure before heparin use for current illness
    d. Although developing typically 5 to 15 days post heparin use, HIT can develop within 24 hours of initiation of therapy

15. In the DIC scoring system which parameter is **not** measured to diagnose DIC
    a. APTT
    b. Platelet count
    c. Prothrombin Time (PT)
    d. D-dimer

16. In Australia which statistic is correct regarding transfusion related adverse events
    a. Transfusion Related Acute Lung Injury (TRALI) is thought to be the most common cause of transfusion associated fatalities
    b. Acute Haemolytic reactions are approximately 1 in 1 million
    c. Transfusion associated infection from Hepatitis C has a higher incidence than transfusion associated sepsis from bacteria
    d. Transfusion related Graft vs Host disease has a 30% mortality

17. Which drug pharmacodynamics mechanism is **incorrect**
    a. Clopidogrel selectively inhibit platelet activation induced by ADP
    b. Aspirin reversibly inhibits platelet COX
    c. Dabigatran is a direct thrombin inhibitor whilst Rivaroxaban and Apixaban are direct Factor Xa inhibitors
    d. Fondaparinux binds to anti-thrombin and enhances its affinity for Factor Xa but not thrombin

18. In SVC obstruction syndrome which is the most common tumour causing this
    a. Lymphoma
    b. Thymoma

c. Lung cancer
d. Thyroid cancer

19. What is the **key** step in the treatment of hypercalcaemia secondary to malignancy
    a. Calcitonin or Bisphosphonate
    b. Frusemide
    c. IV N.Saline 500mL/h
    d. Haemodialysis

20. In hyponatraemia which is the **least** appropriate treatment
    a. Increase serum Na levels by 0.5mmol/h and max 12 mmol/24h
    b. Water restriction is first line in SIADH
    c. 3% Saline 100mL over 20 min to 60 min if seizure due to hyponatraemia
    d. Fluid restriction and oral frusemide 1mg/kg

21. Regarding Tumour Lysis Syndromw which is correct
    a. It causes hyperkalaemia, hypercalcaemia and hypophosphataemia
    b. Liver failure is the strongest predictor of morbidity
    c. Tumour Lysis Syndrome is common with solid tumours
    d. It is uncommon without prior therapy

Answers:

1. C (B12/folate deficient anemia can be a macrocytic or normocytic anemia so MCV can be high or normal, RDW has to be high, Reticulocyte is a measure of bone marrow turnover and is high in post bleeding or hemolysis so in deficiencies it has to be normal or low. Iron deficiency causes MCV low or normal, RDW high, Retic normal.)
2. D (Other causes of low MCV: iron deficiency, lead poisoning. Hypothyroid can cause macrocytic and microcytic anaemia. Chronic disease can normocytic or microcytic anemia)
3. B (Other platelet disorder bleeds: epistaxis, petechie, GI or GU bleed, heavy menses, purpura. The other choices are more likely due to coagulopathy)
4. A (Other acquired: essential thrombocythemia, polycythemia vera, paroxysmal nocturnal hemoglobinuria, cancer)
5. A (ITP is destruction of platelet does not affect RBC)
6. C (Acute ITP more common in children affecting both genders precipitated by infection and peak incidence at 5 years old and resolves spontaneously in weeks to months, chronic ITP affects adults more often associated with underlying disease or autoimmune disorder and affects females > males, only platelets counts < 30,000 with symptoms require IV Ig or steroids, platelets in circulation function normally. ITP, DUNN RJ emergencymedicinemanual.com 2016)

7. B (females > males, prognosis has improved with plasma exchange but relapse rate is 50%. Thrombotic microangiopathies, DUNN RJ emergencymedicinemanual.com 2016)
8. A (Rarely affects other organs, E.coli with Shiga toxin is the most common infection causing disease, antibiotics should be avoided as this can increase Shiga toxin release. DUNN)
9. B (Whilst APTT may be raised INR levels should be normal, haemarthrosis can be reliably reported by the patient even in the absence of clinical evidence, mild disease 5-40% activity, moderate 1-5%, severe <1%)
10. B (Cryoprecipitate can be given it contains factor VIII and vWF as well as fibrinogen, asprin and NSAIDs should be avoided, type III is the most severe)
11. D (skin ulcers especially around malleoli are common in older sickle cell patients)
12. C (Sickle cells disease and Raynaud's are contraindications for Bier's Block. Cameron, Textbook of Emergency Medicine 4th edition)
13. C (Decreased Haptoglobin levels are a sign of haemolysis, lysed RBC release LDH and causes haemoglobinuria, Coombs test would be positive, DIC can develop and may be a fatal reaction. www.transfusion.com.au/adverse_transfusion_reactions/acute_haemolytic_reaction)
14. D (Warfarin can increase risk of microvascular thrombus and should be avoided, HIT is possible without prior exposure to heparin before current therapy, high BMI is a risk factor. Heparin, DUNN RJ emergencymedicinemanual.com 2016)
15. A (Other measure is Fibrinogen level. Disseminated Intravascular Coagulation. DUNN RJ emergencymedicinemanual.com 2016)
16. A (Acute haemolytic reactions incidence is 1:76,000 and fatalities is 1:1.8 million, transfusion associated sepsis due to platelets is 1:75,000 and due to RBC 1:500,000 whilst infection from hepatitis B,C and HIV are less than 1: 1 million each, Transfusion associated Graft vs Host disease is >90% fatal, death occurs within 1-3 weeks of first symptoms. www.transfusion.com.au 2016)
17. B (aspirin irreversibly inhibits COX)
18. C (Lung cancer 70%, lymphoma 20%)
19. C (Key is to promote urinary excretion ideally by forced saline diuresis N.Saline 250-500 mL/h, frusemide is controversial and only useful if in heart failure, do not give thiazide diuretics as it worsens condition, calcitonin/bisphosphonates only take effect in 48h but lasts 15 days, haemodialysis is treatment of choice in CVS or renal compromise. Hypercalcaemia, LITFL 2016)
20. D (Frusemide should be administered concomitantly with N.Saline to maintain euvolaemia. Rapid correction using 3% saline ideally 100mL/h but can be 150mL over 20 min. Hyponatraemia, DUNN RJ emergencymedicinemanual.com 2016)
21. D (Causes hyperkalaemia, hyperphosphataemia and hypocalcaemia. Renal failure is the strongest predictor of morbidity, tumour lysis syndrome is most common with treatment of haematologic malignancies and is uncommon with solid tumours or without prior therapy)