

Blood Test Interpretation for Non-Medics

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Topics

- Full Blood Count
- Clotting
- U&E
- Blood Gases

FBC

- Haematology
- Red blood cells / Haemoglobin
 - Anaemia
 - Polycythaemia
- White blood cells
- Platelets

FBC

- Hb
- WCC or WBC
- Platelets
- MCV

FBC

- Haemoglobin
 - Normal range
 - Low = anaemia
- Anaemia
 - Normocytic
 - Microcytic
 - Macrocytic

FBC Anaemia

- Normocytic
 - Chronic disease
 - Acute bleed
 - Mixed picture
- Microcytic
 - Iron deficiency
 - Sideroblastic
 - Thalassaemia
- Macrocytic
 - B12 deficiency
 - Folate Deficiency
 - Hypothyroid
 - Drugs
 - Alcohol

Question 1

- Susan is a 67 year old woman who presents with tiredness.
- She is usually very well and does not drink
- Her Hb is low at 67g/L
- MCV 74 fl
- Which is the most likely cause of her symptoms?

- a Bowel cancer
- b B12 deficiency
- c Heart failure
- d Drug related
- e Thalassaemia

Question 2

- Susan is a 32 year old woman who presents with tiredness.
- She is usually very well and does not drink
- Her Hb is low at 67g/L
- MCV 74 fl
- Which is the most likely cause of her symptoms?

- a Bowel cancer
- b B12 deficiency
- c Heart failure
- d Heavy periods
- e Thalassaemia

Question 3

- Susan is a 32 year old woman who presents with tiredness.
- She has a 3 month history of diarrhoea
- Her Hb is low at 67g/L
- MCV 108 fl
- Which is the most likely cause of her symptoms?

- a Bowel cancer
- b B12 deficiency
- c Crohn's disease
- d Heavy periods
- e Thalassaemia

Question 4

- Susan is a 32 year old woman who presents with tiredness.
- She has rheumatoid arthritis
- Her Hb is low at 67g/L
- MCV 90 fl
- Which is the most likely cause of her symptoms?

- a Bowel cancer
- b Folate deficiency
- c Crohn's disease
- d Chronic disease
- e Thalassemia

FBC White Cells

- Neutrophils
- Lymphocytes
- Eosinophils
- Monocytes
- Basophils

FBC White Cells

- Neutrophils
 - Infections and sepsis
- Lymphocytes
 - Viruses
- Eosinophils
 - Parasites
 - Vasculitis
- Monocytes
 - Glandular fever
- Basophils

FBC White Cells

- Remember leukaemia

FBC White Cells

- Susan is a 32 year old lady who presents with a cough, green sputum and pneumonia on her CXR.
- Her neutrophils are 20.6×10^5 and her lymphocytes are 0.7×10^5
- Why are neutrophils low?
- Might her neutrophils be low and why?
- Would you act on the low lymphocytes?

FBC Platelets and Clotting

- How does blood clot?

FBC Platelets and Clotting

- Platelets $150-400 \times 10^5$
- Low platelets:
 - Thrombocytopenia
 - ITP
 - Viruses
 - Alcohol
 - LMWH
 - HIV
- Raised platelets
 - Thrombocythaemia
 - Inflammation
 - 'Malignancy'.

FBC Platelets and Clotting

- Platelets $150-400 \times 10^5$
- Even if normal number they might not work!
- Why?

FBC Platelets and Clotting

- Clotting
 - PT prothrombin time
 - APTT activated thromboplastin time
 - INR international normalisation ratio
 - TT thrombin time

FBC Platelets and Clotting

- Susan is a 32 year old lady with a recent history of pneumonia.
- She presents with a platelet count of 8×10^5
- She has a widespread rash?

- Why might she have low platelets?
- Does she require LMWH?

FBC Platelets and Clotting

- Rita is a 32 year old lady with a recent history of pneumonia.
- She represents with a platelet count of 188×10^5
- She has right side pleuritic chest pain and hypoxia?

- What is the diagnosis?
- Why would you check her clotting?

FBC Platelets and Clotting

- Rita is a 32 year old lady with a recent history of pulmonary embolism.
- She is taking warfarin and has antibiotics for a UTI.
- She presents with epistaxis.
- Her INR is 10.
- What would you do?

U&E

- Sodium
- Potassium
- Urea
- Creatinine
- eGFR

U&E

- Sodium 133-145 mmol/L
 - Hyponatraemia
 - Hypernatraemia
- Potassium 3.5-5.0mmol/L
 - Hypokalaemia
 - Hyperkalaemia
- Urea
 - Low or high
- Creatinine
 - Low or high
- eGFR

U&E

- Sodium 133-145 mmol/L
 - Hyponatraemia
 - Hypernatraemia
- Potassium 3.5-5.0 mmol/L
 - Hypokalaemia
 - Hyperkalaemia
- Urea 4.5-7.5 mmol/L
 - Low or high
- Creatinine 60-90 $\mu\text{mol/L}$
 - Low or high
- eGFR

U&E Sodium

- Sodium 133-145 mmol/L
 - Hyponatraemia
 - Too much water
 - SIADH syndrome of inappropriate antidiuretic hormone
 - Too much water and salt
 - Too little salt
 - Hypernatraemia
 - Too little water
 - Dry
 - Hyperglycaemia
 - Diabetes insipidus

U&E Sodium

- Hyponatraemia
- Is it common?
- What is the common presentation?
- How do you cure 90%?

U&E Potassium

- Potassium 3.5-5.0mmol/L
 - Hypokalaemia
 - Drugs
 - Diarrhoea
 - Hyperkalaemia
 - AKI or CKD
 - DKA
 - Drugs

U&E Potassium

- Hypokalaemia / Hyperkalaemia
- Why the fuss
- How would you assess severity?

U&E Kidneys

- Urea
 - Dry
 - GI bleed
 - Alcohol
 - Diet
 - Addison's disease
- Creatinine
 - Weight
- eGFR

Blood Gases

- pH
- O₂
- CO₂
- HCO₃⁻
- Base excess
- Lactate

Blood Gases

- Venous
- Arterial
- Pros and cons

Blood Gases

- pH 7.35 to 7.45
- O₂ 13 KPa or above
- CO₂ 3.5 to 6 KPa
- HCO₃⁻ 21 to 32 mmol/L
- Base excess -2 to +2
- Lactate less than 2

Blood Gases

- Metabolic v Respiratory
- Acidosis v Alkalosis
- Respiratory failure

Blood Gases

- pH 7.35 to 7.45
- O₂ 13 KPa or above
- CO₂ 3.5 to 6 KPa
- HCO₃⁻ 21 to 32 mmol/L
- Base excess -2 to +2
- Lactate less than 2

Blood Gases

- What would the following look like:
 - Metabolic acidosis
 - Metabolic alkalosis
 - Respiratory acidosis
 - Respiratory alkalosis