



## The OMFS Survival Guide

### Interpreting Basic Bloods

#### Aims & Objectives

- To give an overview of indications for ordering certain bloods
- To understand pathophysiology behind certain trends in blood tests
- To understand which cases may need further investigation/ management by OMFS or another medical team

#### FBC

- **Indications for ordering:**
  - o To look at inflammatory markers.
  - o Assess for anaemia (important in patients who have had blood loss or pre-op as may require transfusion).
  - o Assess the platelet count (important pre- operatively and also if v. low platelets may require transfusion and management of the cause).

**WCC: High:** Inflammation, infection, can be disproportionately high in pts with haematological malignancies (usually ALL & CLL, you can request a blood film for the lab to assess the shape of the cells if you see anyone with a v low or high WCC).

**Low:** Haematological malignancy (ask for blood film as above), chemotherapy/ radiotherapy, immunosuppressed due to alcoholism, immunosuppressive medications such as some antipsychotics, rheumatological drugs (e.g. methotrexate), HIV patients, metronidazole (rare) and other abx.

**Hb: High:** Smokers/COPD- these patients have developed a higher count as requiring more oxygen. Kidney cancer, polycythaemia.

**Low:** Bleeding, anaemia (assess alongside MCV), haematological malignancy, CKD, vitamin deficiencies, menstruation in females.

**Indications for transfusion:**

Hb <70, or <80 if history of cardiac disease. Massive blood loss.

If the pt has a free flap always discuss with the consultant- transfusion can increase the risk of congesting the free flap due to sudden increase in viscosity of the blood.

**MCV: High: (Macrocytic anaemia):** Deficiencies in folate or B12, alcoholism.

**Low: (Microcytic anaemia):** Anaemia of chronic disease, iron deficiency anaemia (can do haematinics screen to confirm this), acute bleed, thalassaemias.

**Haematocrit:** Is looked at to assess if the blood is possibly diluted. E.g. if a patient has had a lot of fluids you may see the Hct go up and the Hb fall- indicating the blood is being diluted.

**Neutrophils:** If raised indicate **bacterial** infection. If reduced- as above for WCC.

**Lymphocytes:** If raised indicate **viral** infection.

**Platelets:** **High:** Inflammatory markers so increase in inflammation/ infections (platelets are used to wall off abscesses so if continually rising pt could be developing a collection somewhere), polycythaemia, myelofibrosis, pts with no spleen, malignancy.

**Low:** Alcohol excess, idiopathic thrombocytopenia, malignancies, anti-platelet drugs, can be induced by long-term administration of heparin for VTE prophylaxis.

## CRP

- **Indications for ordering:**
  - o To assess progression/ resolving of infection or inflammatory process.

This is a “lag phase” protein- so may not rise immediately with infection. It is an expensive test so don't order it unless patient has an infection/suspected infection or inflammation. E.g. don't order in trauma patients as it doesn't provide useful information.

## U&Es

- **Indications for ordering:**
  - o Assess kidney function prior to administering any medications.
  - o Assess electrolytes for derangement and for diagnosis.

**Sodium:** **High:** Dehydration, medications (e.g. lithium, furosemide).

**Low:** Fluid overload, syndrome of inappropriate ADH secretion (SIADH, important in cancer pts), medications (e.g. omeprazole, thiazide diuretics, SSRIs).

**If a patient has persistently high or low sodium despite fluid replacement/restriction you can order serum and urine osmolality tests and the medical teams can advise you on treatment according to these test results.**

**Potassium:** **High:** Renal pathology (AKI, CKD), Use of ACE- Inhibitors or Angiotensin-II Receptor Blockers, potassium supplementation. **(If >5.5 must get an ECG).**

**Low:** Malnutrition, alcohol excess, CKD, DKA, Diarrhoea, thiazide diuretics, insulin overdose, steroid use **(If <3 must get an ECG).**

**If a patient's K<sup>+</sup> increases suddenly, this could be because the sample has haemolysed and the K<sup>+</sup> has leaked out of the cells- can take a VBG to double check this.**

**Urea:** **High:** Acute kidney injury, CKD, UTI, kidney stones. If rises by itself (and creatinine stays low) this could be a sign of an upper GI bleed- the cells are digested and release urea.

**Low:** Usually of no concern, may be seen in malnutrition or severe liver disease.

**Creatinine:** **High:** AKI, CKD, renal infection.

**Low:** Pts with low muscle mass, muscular dystrophy. Usually of no concern.

**eGFR:** Calculated according to creatinine, age, sex, ethnicity. Gives an estimation of the glomerular filtration rate (i.e. how well the kidneys are functioning). If dropped may indicate AKI, or CKD. Most drug doses don't need to be adjusted until eGFR<30, but check the BNF. You can speak to the medical team or use the Renal Drug Handbook to prescribe for these patients.

## Bone Profile

- **Indications for ordering:**
  - Patients who have been starved for some time due to infection, cancer
  - Patients with excessive alcohol intake

- Patients symptomatic of possible low calcium e.g. pins and needles complaints, or confusion.

**Calcium (adj):** We use this figure rather than normal calcium; all calcium is bound to albumin in the blood and therefore this measurement is more accurate as it accounts for the albumin level.

**High:** Dehydration, Malignancy, Hyperparathyroidism, Medications (Lithium, thiazide diuretics, excess Vit D), excess Calcium supplementation.

**Low:** Vit D deficiency, hypoparathyroidism (primary or from surgery).

**If a pt has high/low Ca despite the fluid protocol or replacement, order a PTH and Vit D level to assess the cause. Also get an ECG.**

**Phosphate:** **High:** CKD, DKA, Hypocalcaemia, Hypoparathyroidism.

**Low:** Refeeding syndrome, alcohol excess, DKA, severe burns,, drug-induced (thiazide diuretics, corticosteroids, salbutamol, mannitol).

**Magnesium:** **High:** AKI, CKD, DKA, hypothyroidism

**Low:** Starvation, alcoholism, drug induced (e.g. thiazide diuretics, PPIs).

**For all electrolyte abnormalities check your local guidelines for management, it is important remember all of them (high or low) can cause arrhythmias so getting an ECG is important if the level is very high or very low.**

## ABG & VBG

- **ABG indicated for:** Any patient who is tachypnoeic, oxygen saturations low (has accurate O<sub>2</sub> and CO<sub>2</sub> levels, plus everything else you see on a VBG).
- **VBG indicated for:** Any other unwell patient (inaccurate for O<sub>2</sub>, but can see glucose, pH, lactate, potassium and ketones).

## Disseminated Intravascular Coagulation

- Caused by trauma (major haemorrhage), sepsis, cancer or pregnancy.
- Your blood begins to clot, this in turn uses up the clotting factors and platelets which leads to more bleeding
- Bloods will show low platelets, increased PT and APTT on the coagulation screen and increased INR

- Treatment is aimed at the cause (e.g. treatment of infection) as well as replacement of clotting factors with transfusion of fresh frozen plasma, platelets or cryoprecipitate.
- Has a high mortality rate (30-50%), early identification and management is key!

## Refeeding Syndrome

- Occurs when a malnourished person begins artificial feeding (e.g. after prolonged starvation due to malignancy, infection, also seen in pts with eating disorders). Feeding may be via NG feeds or total parenteral nutrition (a way of giving feeds IV).
- Involves shifts in fluids and electrolytes that can be fatal.
- When starved, the body uses ketones for energy and preserved fats and proteins.
- During refeeding, the increased glucose leads to increased insulin that is disproportionate, this causes the shifts of glucose, potassium, magnesium and phosphate into the cells. Water follows by osmosis.
- The decreased serum levels of the electrolytes means they are not present for usual cell activities and can cause dangerous cardiac arrhythmias.

## Further reading:

General assessment of OMFS patients: <https://www.amazon.co.uk/Call-Oral-Maxillofacial-Surgery-2nd/dp/1909818585>

FBC Interpretation:

<https://geekymedics.com/fbc-interpretation/>

U&E Interpretation:

[https://oscestop.com/U&Es\\_interpretation.pdf](https://oscestop.com/U&Es_interpretation.pdf)

Mind the Bleep (Has a range of articles on abnormal investigations):

<https://mindthebleep.com/abnormal-investigations/>

NICE CKS on Major Haemorrhage

<https://pathways.nice.org.uk/pathways/trauma/major-haemorrhaging-in-hospital.pdf>

E- Face:

<https://www.e-lfh.org.uk/programmes/oral-and-maxillofacial-surgery/>

