Abnormal FBC Results Guidance

This guidance has been developed from published guidance, in collaboration with local Haematologists and Gastroenterology, in response to frequently asked questions on interpreting FBCs.

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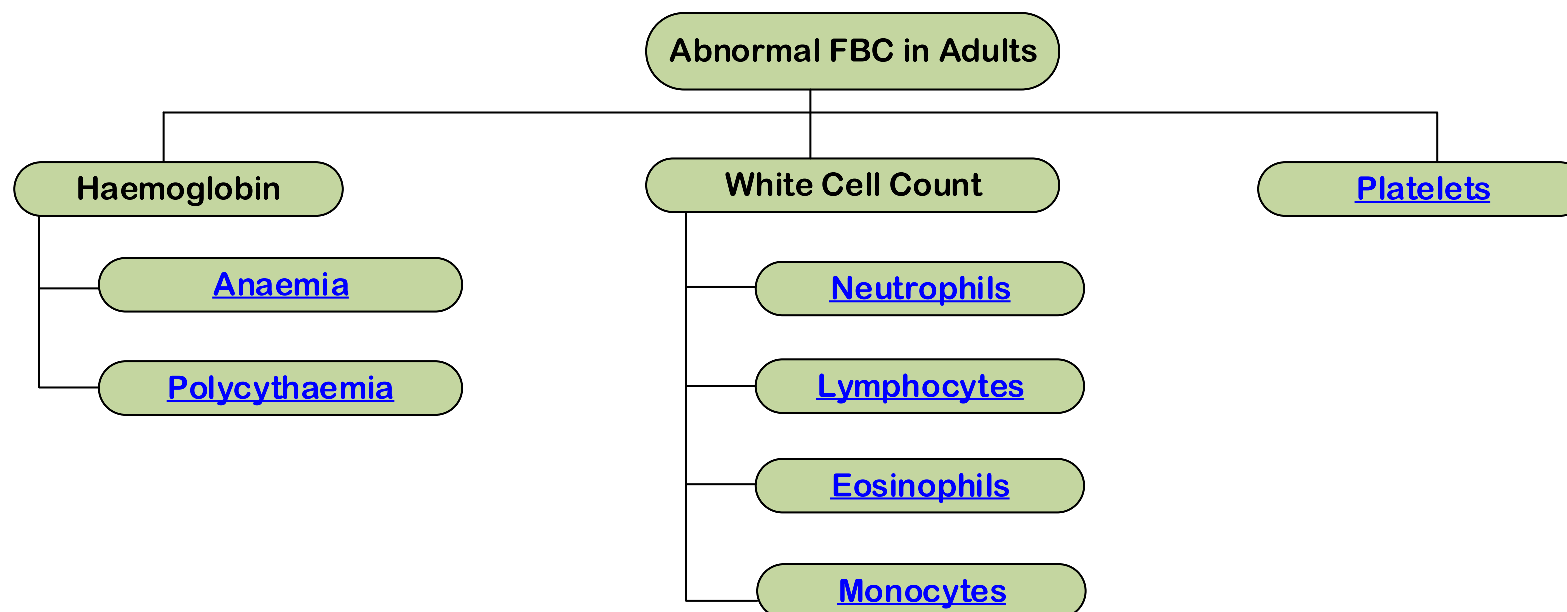
This guidance is to assist GPs in decision making and is not intended to replace clinical judgment.

You may also want to seek further specific guidance using the 'Advice and Guidance' service.



NB – Abnormalities affecting more than one cell type are more likely to be due to bone marrow causes rather than reactive. Always consider earlier referral when the patient is unwell.

Produced in collaboration with local Haematologists and Gastroenterology
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Pathway created by Sarah Morgan & Alex Warner
and approved by Camden PEC March 2013
Updated by Craig Seymour June 2015
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NB Mixed deficiency
Look at the whole picture

Anaemia

Hb <130 g/L men
<115 g/L non-pregnant women

Monitor FBC for evidence of progression over time

MCV

Low (<76) — Normal (76-96) — High (>96)

Low (<76)

Check Ferritin (NB can be raised in inflammation/infection) + Consider Hb electrophoresis (if no previous)

< 15 Low

Iron Deficiency Anaemia

Upper GI symptoms

or

Unexplained
Hb < 110 Men
Hb <100
Non-menstruating Women

Urgent referral (2wk) for upper & lower GI endoscopy

Family history colorectal cancer
(2x1st deg relatives *or* 1x1st deg age <50)

Urgent referral (2wk) for lower GI endoscopy

Coeliac Serology (tTG)

tTG +ve → Refer gastroenterology

Heavy menstrual bleeding pathway

Dietary history

Urine dip ?blood

Consider stool parasitology

Oral iron replacement
Ferrous Fumarate
Start OD and increase as tolerated to BD
+ Consider Laxative
NB Iron Absorption better with food, orange juice/Vit C
Reduced by tea/coffee
Dietary advice
Consider alternative oral preparation if not tolerated

Consider referral for parenteral iron if oral iron not tolerated

Recheck Hb / Ferritin at 3 months

Not iron replete (& not due to menstrual loss) → Refer gastroenterology

> 15 Normal / Raised

NB Ferritin acute phase reactant
Chk serum iron/TIBC

Anaemia of Chronic Disease?

Beta Thal trait
(↑HbA2)

Alpha Thal trait
(difficult to diagnose as no specific test)

Counselling /
Info leaflets

Refer / discuss with haematology as clinically appropriate

Normal (76-96)

Anaemia of Chronic Disease?
Mixed Haematinic Deficiency?
Recent blood loss?

Anaemia of Chronic Disease

Chronic Inflammation
(eg. TB,SLE, RA, Malignancy)
Endocrine
(eg. Hypothyroidism, Addisons, Hypopituitarism)
Other
(eg. CKD, Liver disease, Malnutrition)

Myelodysplastic syndromes (lone unexplained persistent anaemia)

Consider haemochromatosis where Ferritin raised

Refer to appropriate specialty as necessary

High (>96)

Review history:
Duration, Symptoms, Bleeding, Diet, Medication, Alcohol, Family Hx, Recent transfusion?

Check ESR,
LFT (+ GGT),B12, Folate, TFT, Renal

Blood Film, Reticulocyte Count

Myeloma screen
if suspicion of malignancy
(+Serum & Urine electrophoresis, Immunoglobulins, Bone profile)

Associated FBC abnormalities
Abnormal cell shapes on blood film

Persistent Unexplained Anaemia, raised MCV (>100) or B12 deficiency

Spherocytes on blood film (?Haemolysis)

DAT test
+ Reticulocyte count
Normal Retic:
(men 28-105, women 25-92)

DAT +ve/ Raised Retic

Refer to haematologist

Urgently refer to haematology:

Leucoerythroblastic anaemia on blood film

Unexplained progressive symptomatic anaemia

Associated splenomegaly, lymphadenopathy or other cytopenias

Polycythaemia

Men: Hb > 185 Hct > 0.52
Women: Hb > 160 Hct > 0.48

May be associated with increased WCC & Platelets + Basophils

Probable primary polycythaemia (Ferritin usually low)

Causes of Polycythaemia

Apparent

Reduced plasma volume
Common in obese men, associated with smoking, diuretics, alcohol, hypertension, stress, dehydration
At risk of occlusive vascular episodes

Absolute

1° Polycythaemia (Rubra Vera)
(92% are JAK2 +ve)

2° Polycythaemia
Hypoxia
(COPD,Heart disease, smoking)
Abnormal EPO production
(Renal & liver tumours, fibroids)

WCC & Platelets normal

Probable secondary polycythaemia (Ferritin usually normal)

Modify known associated lifestyle factors
+ Monitor FBC

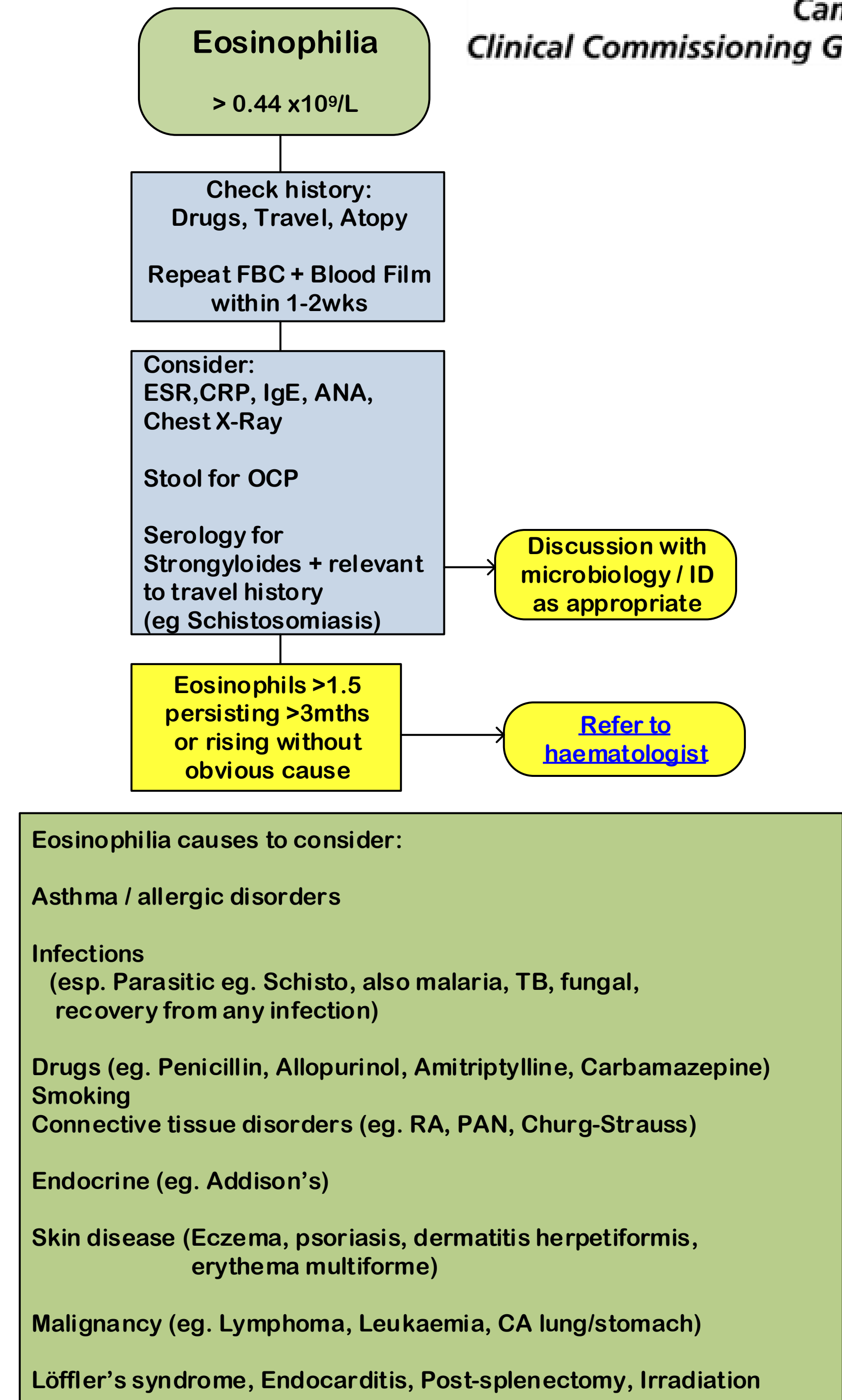
Refer if:

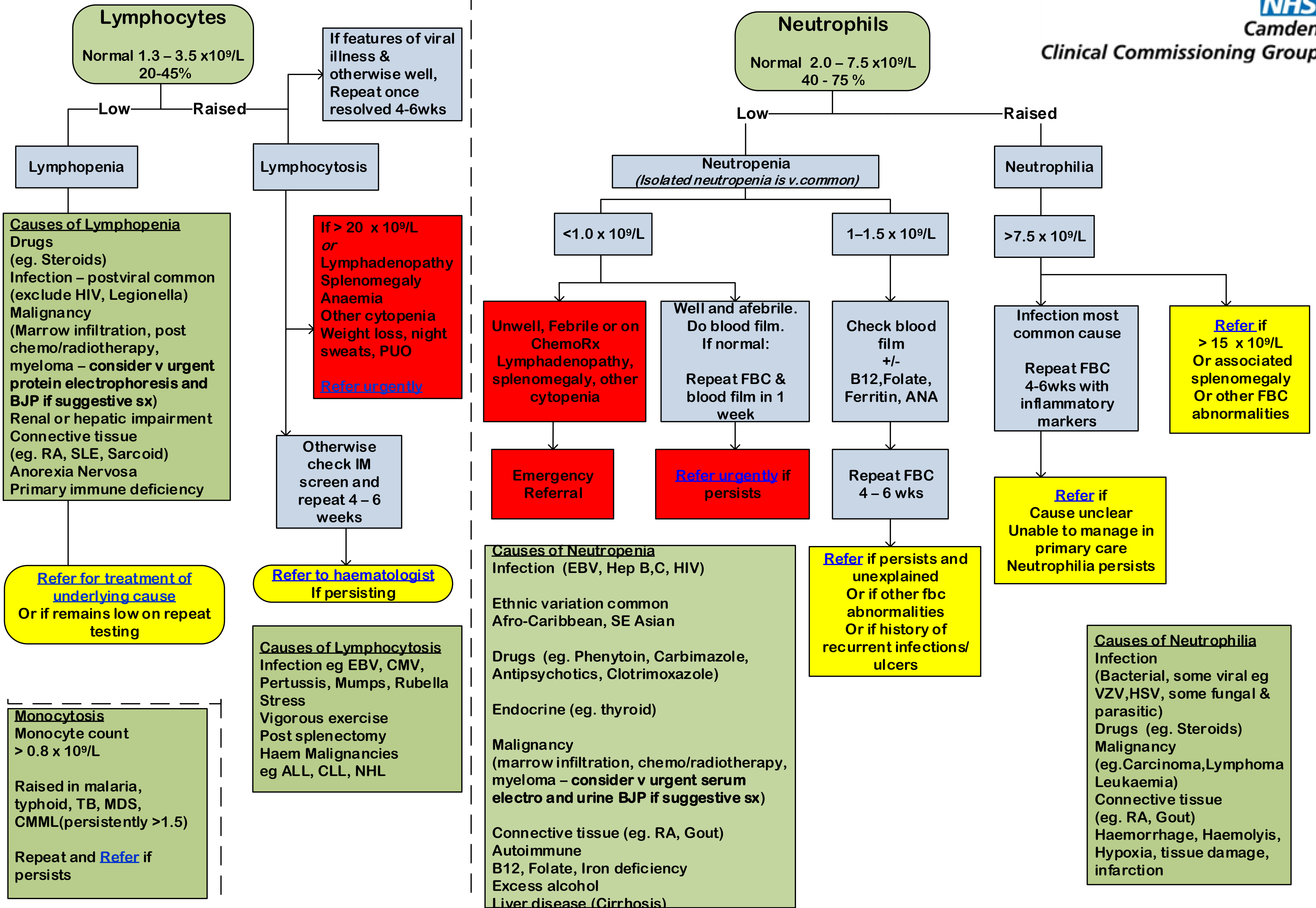
Raised Hct >0.52 males
>0.48 females
(uncuffed blood samples)
+ Past history of arterial or venous thrombosis
Splenomegaly, Pruritus, Elevated WCC or Platelets

Or if persistent, unexplained raised Hct above these levels on at least 2 occasions over 4 weeks apart.

Urgently Refer: (2wks)
Hb >200 g/l / Hct > 0.60 (in absence of chronic hypoxia)

Raised Hb in association with:
Recent arterial or venous thrombosis
Neurological Symptoms
Visual Loss
Abnormal bleeding

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Lymphocytes
Normal 1.3 – 3.5 x10⁹/L
20-45%
Low
Raised
If features of viral illness & otherwise well, Repeat once resolved 4-6wks
Lymphopenia
Lymphocytosis
Causes of Lymphopenia
Drugs
(eg. Steroids)
Infection – postviral common
(exclude HIV, Legionella)
Malignancy
(Marrow infiltration, post chemo/radiotherapy, myeloma – consider v urgent protein electrophoresis and BJP if suggestive sx)
Renal or hepatic impairment
Connective tissue
(eg. RA, SLE, Sarcoid)
Anorexia Nervosa
Primary immune deficiency
If > 20 x 10⁹/L
or
Lymphadenopathy
Splenomegaly
Anaemia
Other cytopenia
Weight loss, night sweats, PUO
Refer urgently
Otherwise check IM screen and repeat 4 – 6 weeks
Refer for treatment of underlying cause
Or if remains low on repeat testing
Refer to haematologist
If persisting
Causes of Lymphocytosis
Infection eg EBV, CMV, Pertussis, Mumps, Rubella
Stress
Vigorous exercise
Post splenectomy
Haem Malignancies
eg ALL, CLL, NHL
Monocytosis
Monocyte count
> 0.8 x 10⁹/L
Raised in malaria, typhoid, TB, MDS, CMML(persistently >1.5)
Repeat and Refer if persists
Neutrophils
Normal 2.0 – 7.5 x10⁹/L
40 - 75 %
Low
Raised
Neutropenia
(Isolated neutropenia is v.common)
Neutrophilia
<1.0 x 10⁹/L
1–1.5 x 10⁹/L
>7.5 x 10⁹/L
Unwell, Febrile or on ChemoRx
Lymphadenopathy, splenomegaly, other cytopenia
Well and afebrile.
Do blood film.
If normal:
Repeat FBC & blood film in 1 week
Check blood film
+/-
B12,Folate, Ferritin, ANA
Infection most common cause
Repeat FBC 4-6wks with inflammatory markers
Refer if
> 15 x 10⁹/L
Or associated splenomegaly
Or other FBC abnormalities
Emergency Referral
Refer urgently if persists
Repeat FBC
4 – 6 wks
Refer if
Cause unclear
Unable to manage in primary care
Neutrophilia persists
Causes of Neutropenia
Infection (EBV, Hep B,C, HIV)
Ethnic variation common
Afro-Caribbean, SE Asian
Drugs (eg. Phenytoin, Carbimazole, Antipsychotics, Clotrimoxazole)
Endocrine (eg. thyroid)
Malignancy
(marrow infiltration, chemo/radiotherapy, myeloma – consider v urgent serum electro and urine BJP if suggestive sx)
Connective tissue (eg. RA, Gout)
Autoimmune
B12, Folate, Iron deficiency
Excess alcohol
Liver disease (Cirrhosis)
Refer if persists and unexplained
Or if other fbc abnormalities
Or if history of recurrent infections/ ulcers
Causes of Neutrophilia
Infection
(Bacterial, some viral eg VZV,HSV, some fungal & parasitic)
Drugs (eg. Steroids)
Malignancy
(eg.Carcinoma,Lymphoma Leukaemia)
Connective tissue
(eg. RA, Gout)
Haemorrhage, Haemolyis, Hypoxia, tissue damage, infarction

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Check history: travel, drugs, alcohol

Ask about bleeding history:
Spontaneous skin/mucosal bleeding, bruising, GI bleeding, epistaxis, gums, menorrhagia.
Post dental / surgical haemorrhage
Haemarthoses / muscle haematomas

Platelets

Normal 150 - 400 $\times 10^9$/L

< 150: Thrombocytopenia

Often artefact
Repeat with blood film

- < 50 $\times 10^9$/L → Urgent Outpatient Referral
  If < 20 $\times 10^9$/L or any bleeding
  Refer for same day assessment
- 50-100 $\times 10^9$/L
  - If other cytopenia, splenomegaly, lymphadenopathy, pregnancy, upcoming surgery Urgent Outpatient Referral
  - Otherwise Refer If persists > 4-6 weeks and unexplained
- 100-150 $\times 10^9$/L → Repeat monthly & Refer if progressive decrease, other FBC abnormalities or if unwell

> 400: Thrombocytosis

Check for hepato/splenomegaly or neuro symptoms

Check CRP, Blood film, Ferritin

Urgently Refer:
Abnormal Bleeding
Neurological symptoms
Plt > 1000 $\times 10^9$/L

Or > 600 $\times 10^9$/L
with recent thrombosis or at high risk thromboembolism or CVD

Or Splenomegaly
Other symptoms suggestive malignancy
Other significantly abnormal FBC indices

If asymptomatic repeat after 4-6 wks

- < 450 $\times 10^9$/L → No further action required
- >450 $\times 10^9$/L → Treat 2° causes
  Check Hb/Ferritin (Polycythaemia?)
  → Refer haematology if persistent unexplained > 600 $\times 10^9$/L on at least 2 occasions 4-6 weeks apart
  Or 450-600 $\times 10^9$/L in association with other FBC abnormalities

Thrombocytopenia

Viral infection including EBV (usually resolves within few weeks)
Also HIV, Malaria, TB

Drugs
(NSAIDs, Heparin, Digoxin, Quinine, anti-epileptics, antipsychotics, PPIs)
Alcohol

Malignancy
Liver & Renal disease

Aplastic anaemias,
B12/Folate deficiency
Autoimmune / ITP / SLE

Thrombocytosis

1° - Myeloproliferative (likely if splenomegaly and plt >1000)

2° - More common
Reactive
(Infection, inflammation haemorrhage, exercise, tissue damage, post-surgery, haemolysis)
Malignancy
Hyposplenism/Splenectomy
Iron deficiency