

Abnormal bloods (ALP, B12, faecal calprotectin, thyroid function TSH and T4, white cell and platelet counts)

Dear [Dr _____],

Advice and guidance response pertaining to [Patient name].

[Include sections below as relevant]

1. Alkaline phosphatase (ALP)

Can be liver or bone in origin - liver function tests (GGT/ALT) would help to differentiate.

Most common causes are:

Infants: Metabolic bone disease of infancy, esp in premature infants

High bone turnover e.g. recent fracture, early childhood (<5yrs) or pubertal growth spurt.

(Systemically well with no other evidence of liver or renal disease.) Repeat in 4-6 months to ensure resolution

Recent viral infection

Rarer but important causes are liver disease; metabolic bone diseases (such as hyperparathyroidism; chronic renal failure, Vitamin D deficiency and rickets); drug-induced.

History should include recent medications or viral infections. If further blood tests considered, please include renal, liver function and bone profile, vitamin D level and parathyroid hormone.

Refer if:

Significantly elevated (>twice upper limit of normal)

Associated with other abnormal liver enzymes, or clinical signs of jaundice

Persistently raised >6months

Treat if low Vitamin D; refer to appropriate service if other causes identified (e.g. renal or endocrine)

2. Vitamin B12

Isolated high B12 levels in children is usually benign. Most common reasons for high B12 levels in children are either idiopathic or from dietary causes, particularly from over-supplementation.

A common concern for GPs and families is the link to haematological malignancy, but this link is very rare in children and in the absence of any other suspicious features of cancer (weight loss, bruising, lymphadenopathy) there is no need to investigate an isolated high B12 further.

Other very rare pathological causes of high B12 include liver disease and renal disease; again, in the absence of other features no further testing is needed to exclude these. B12 should not be done routinely in children as part of a "haematinic screen", or non-specific symptoms such as headache or malaise.

3. Faecal calprotectin

Do not measure faecal calprotectin in primary care for children under five (and in particular infants) as it is not validated. It may be more useful in adolescents, where a normal result excludes inflammatory bowel disease.

If already performed, interpret with caution - levels of <250 in children, in the absence of history or systemic symptoms suggestive of IBD (weight loss, anaemia), are extremely unlikely to be related to inflammatory bowel disease.

4. Thyroid function tests

TSH and T4 are the most useful tests to undertake.

Can be falsely deranged in:

- Neonates (due to placental transfer)
- Recent physiological stress e.g. infection. ("Sick euthyroid syndrome") Transient - repeat in 4 weeks if otherwise well to ensure resolution
- Biotin supplementation

Treat all results in clinical context, but general guide below:

If TSH is high; T4 is low – primary hypothyroidism likely. Refer to paediatrics; start treatment with low dose levothyroxine (25mcg od) in the first instance

If TSH is high; T4 is normal – likely transient esp. if TSH <10, but may be subclinical hypothyroidism. Repeat in 8 weeks (plus anti-thyroid peroxidase (TPO) and anti-thyroglobulin antibodies if not already done); refer if not resolved

If TSH normal/low; T4 is low – may be secondary hypothyroidism, or sick euthyroid. Rarely related to pituitary pathology - discuss if concerns over red flags for raised intracranial pressure. Usually most likely related to chronic stress response - explore related factors and repeat in 3 months - if not resolved, refer routinely: do not start treatment without discussion with paediatrics/paed endocrinology as cortisol deficiency needs to be excluded/treated first

If TSH normal/low; T4 is high – May be hyperthyroidism - will always require referral:

- Urgently if symptomatic and/or TSH <0.2
- Otherwise, routine referral - repeat TFTs in 4 weeks while waiting for appt (plus T3, anti-thyroid peroxidase (TPO), TSH receptor antibodies and anti-thyroglobulin antibodies if not already done)

5. Abnormal cell counts

White cell count

Incidental isolated abnormalities in lymphocytes/neutrophil counts in children, both low or high, are usually transient, and most commonly due to intercurrent or recent infection. If the child is well, there is no need to repeat the test (unless neutropenia of <1): reassure parents and provide safety net advice. Asymptomatic neutropenia should be repeated no sooner than 4 weeks' time to minimise need for repeated sampling.

Children of African, Middle Eastern and West Indian descent may exhibit benign ethnic neutropenia (BEN) - "neutropenia, defined by normative data in white populations, in individuals of other ethnic groups who are otherwise healthy and who do not have repeated or severe infections". Clinically, patients with BEN are at no increased risk of infection despite their neutropenia. Reassure parents if otherwise well.

Platelet counts

Isolated high platelets (thrombocytosis; >450)

In otherwise well children, with no signs or symptoms suggestive of chronic inflammation or Kawasaki disease, incidental findings of isolated raised platelets is most commonly due to intercurrent illness; inflammation (e.g. eczema) or iron deficiency.

If platelets raised >450 (but <1000):

- Ensure ferritin is normal and no other source of infection/inflammation to explain; if so, repeat in 3 months
- If repeat level still >450 then refer to paediatrics (or paediatric haematology if available)

If platelets raised >1000:

- Refer to paediatrics (or paediatric haematology if available). Same day assessment if acutely unwell, or concerns over acute inflammation, systemic illness etc.

Isolated low platelets (Thrombocytopenia; <150)

Mild (100-150): usually due to intercurrent illness, no need to repeat if systemically well and asymptomatic

Moderate (50-100): usually due to intercurrent illness; if systemically well and asymptomatic, repeat in 4 weeks. Refer if not resolved.

Severe (20-50): Urgent referral to paediatrics/paediatric haematology if available. Advise to avoid contact sports in the interim: while spontaneous “wet” bleeding is unlikely if platelets >20, there may be spontaneous bruising, and an increased risk of bleeding from mild/moderate trauma.

Very severe (<20): Same day referral to paediatrics for investigation and management of possible immune thrombocytopenia purpura (ITP).

The above advice refers to isolated platelet abnormalities only: if there are concurrent abnormalities of other blood cell lines this should be investigated accordingly.

As per above

If referring back, please state that the referral has already been through Advice and Guidance and include a copy of the previous correspondence, to ensure we don't duplicate advice.

Please complete and send the referral pro-forma.

With kind regards,

[Clinician name and role]