Tests relating to blood clotting

Activated partial thromboplastin time

Normal (baseline) range ..... 25–35 seconds

Anticoagulation therapeutic range ..... 1.5–2.5 times normal (baseline) range

This test is used to monitor the efficacy of unfractionated heparin.

Anti-Factor Xa

Continuous IV infusion ..... 0.5–1.0 anti-Xa units/mL

Subcutaneous injection
..... > 0.3 anti-Xa units/mL (trough)
..... < 1.0 anti-Xa units/mL (peak)

The recommended test for monitoring low molecular weight heparin (LMWH) is an anti-factor Xa (anti-Xa) assay. LMWH, unlike unfractionated heparin, does not affect the activated partial thromboplastin time (APTT). Patients with renal failure, extremes of body weight, or in situations where there is an increased risk of bleeding may have their dose of LMWH adjusted for a given anti-Factor Xa result.

International normalised ratio

Normal (baseline) range 0.9–1.3

The international normalised ratio (INR) is also a marker of the activity of the extrinsic coagulation pathway[2], and is elevated by the same conditions as those affecting prothrombin time. INR is used as the standard monitoring parameter for patients on oral anticoagulants.

Target range for oral anticoagulation
for all indications 2.0–3.0

except:

- thrombosis associated with antiphospholipid antibodies 3.0–4.0
- mechanical prosthetic heart valves 2.5–3.5

Platelet count

Normal range ..... 150–400 × 10^9/L

Certain diseases affect platelet number. Stress and infection are associated with thrombocythaemia, as may be splenectomy, trauma, asphyxiation, rheumatoid arthritis, iron deficiency anaemia, haemorrhage, cirrhosis, chronic pancreatitis, tuberculosis and recovery following bone marrow transplantation. In these cases the values rarely exceed 500–800 × 10^9/L. Platelet counts >800 × 10^9/L occur in primary thrombocythaemia, polycythaemia rubra vera, chronic myelogenous leukaemia and myelosclerosis.

Thrombocytopenia is defined as a platelet count <150 × 10^9/L. Platelet counts <50 × 10^9/L may be associated with increased risk of bleeding with trauma, whereas platelet counts <20 × 10^9/L are associated with an increased risk of spontaneous bleeding. Thrombocytopenia may occur in idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura, disseminated intravascular coagulation and haemolytic–uraemic syndrome. Numerous drugs may also decrease platelet levels, especially heparin, quinine and antineoplastic agents.

Prothrombin time

Normal (baseline) range ..... 11–15 seconds

Anticoagulation therapeutic range ..... >1.5–2 times normal (baseline) range

Prothrombin time (PT) is an indicator of the activity of the extrinsic coagulation pathway[2] and may be used as an indicator of the effectiveness of oral anticoagulants. It may be elevated in patients with poor dietary intake of vitamin K, malabsorption of fat-soluble vitamins and chronic liver disease.

Vitamins

Folic acid

Serum folate ....7–45 nmol/L

Red cell folate ..... 360–1400 nmol/L

Serum folate levels are of minimal diagnostic value since levels may be reduced with a short-term decrease in dietary intake and in systemic illness.[1] Red cell folate is a direct measure of tissue folate stores and falls after about four months of negative folate balance.[9]

Low folate levels may arise due to poor dietary intake, increased folate requirements (e.g. pregnancy, renal dialysis), malabsorption (e.g. coeliac disease, tropic sprue, giardiasis) and certain drugs (e.g. methotrexate, anticonvulsants, proton pump inhibitors). Low folate levels may result in macrocytic anaemia, neural tube defects (in newborns), cardiovascular disease (as a result of elevated homocysteine levels) and cognitive impairment.

High levels usually are a result of vitamin supplementation or the ingestion of a folate-rich meal.

Vitamin B_{12}

Normal..... 120–680 picomol/L

Deficiency of vitamin B_{12} can be associated with a range of non-haematological signs and symptoms. In co-existing vitamin B_{12} and folate deficiency, the haematological signs (low haemoglobin) may