1. **Euthyroid**: normal T4, T3 & TSH levels
2. **Hyperthyroidism**: increased T4 & T3 levels - increased TSH if secondary to hypothalamic-pituitary disease - decreased TSH if primary thyroid disease
3. **Hypothyroidism**: reduced T4 and T3 levels - decreased TSH level if secondary to hypothalamic-pituitary disease - increased TSH level if primary thyroid disease
4. **Euthyroid sick syndrome**: low total T3 level, normal / low T4 & TSH levels - caused by drugs (eg amiodarone), hyperemesis, acute psychiatric illness & hyponatraemia

**General:** These tests are more useful when used to assess response to therapy rather than when used as diagnostic agents

1. **Alpha fetoprotein**: increased in hepatocellular carcinoma, germ cell tumours & pregnancy
2. **CA-15-3**: increased in pancreatic, colorectal & cholangiocarcinoma
3. **CA-125 & CA-72.4**: increased in ovarian tumours
4. **CA-19.9**: increased in pancreatic, colorectal & cholangiocarcinoma
5. **Prostate specific antigen**: increased in prostate cancer, prostatitis & benign prostatic hypertrophy
6. **Calcitonin**: increased in thyroid medullary carcinoma
7. **Carcinoembryonic antigen**: increased in colorectal, liver, lung, breast, cervix, pancreatic, thyroid & bladder cancers

**Biochemistry Tests**

1. **Serum Bilirubin**: conjugated vs unconjugated reflects abnormalities of liver function tests
2. **Transaminases**: massive increases in transaminases are seen in ischaemic & toxic hepatitis
3. **Alkaline phosphatase (ALP)**: released from liver (in bile) & bone - increased in late pregnancy, Paget’s disease, bone growth or injury (including metastatic malignancy) & primary biliary cirrhosis
4. **Lactate dehydrogenase (LDH)**: increased levels reflect ischaemic or necrotic tissue in any part of the body
5. **Human chorionic gonadotrophin**: increased in testicular & trophoblastic tumours
6. **Plasma pseudocholinesterase**: reduced in liver dysfunction, organophosphate poisoning, pregnancy, hereditary deficiency and with plasmapheresis

**Other Tests**

1. **Serum Bilirubin**: conjugated vs unconjugated reflects abnormalities of processing or obstruction to flow
2. **Procalcitonin**: high levels are seen in severe bacterial infections & sepsis - helps differentiate infectious & non-infectious SIRS - minor increases are seen with localised bacterial infections, viruses, infarction, autoimmune & chronic inflammatory conditions
3. **Plasma pseudocholinesterase**: reduced in liver dysfunction, organophosphate poisoning, pregnancy, hereditary deficiency and with plasmapheresis
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**Beta-2 transferrin**: a marker for CSF fluid leak

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