

Key factors known to affect test performance and result interpretation

There are several key factors known to affect the performance of tests or the interpretation of results and although some like jaundice cannot be avoided, others like sample volume and exposure to sunlight, can. It is therefore very important that samples are taken in the correct containers and any specific sampling or transporting instructions adhered to. Some of these key factors are listed below. If any of these are found appropriate comments will be attached to the report and repeat specimens may be requested.

- Cold Agglutinins/Cryoglobulins
- Delay in testing which can affect tests which are prone to sample lability e.g. serum potassium
- Interfering substances (e.g. heparin, bacteria)
- Jaundice
- Haemolysis
- Lipaemia
- High protein level
- Poor sample taking leading to mechanical haemolysis
- Wrong sample container/wrong anticoagulant
- Temperature extremes
- Sample volume – especially where liquid anticoagulants are used
- Exposure to sunlight

Uncertainty of Measurement:

The Laboratory is required to determine uncertainty of measurement for all reportable parameters. Uncertainty of Measurement details are available from the Laboratory on request. However, any UoM details which impact clinically will be communicated directly to users.

Common Specimen Artefacts:

Contact the department if any difficulties in interpretation occur and do not just ignore results which cannot be explained or are thought to be erroneous.

Problem	Common Causes	Consequences
Delay in separation of serum or plasma	Delay in transit.	High K ⁺ , AST, LDH, Mg ²⁺ PO ⁴ Low Na ⁺ (occasionally)
Haemolysis	Expelling blood sample through a needle into specimen tube. Over vigorous mixing of sample. Sample stored in deep freeze. Excessive delay in transit. Sample left in hot place.	High K ⁺ High phosphate (PO ₄ ²⁻) Low Na ⁺ and Cl ⁻ High AST, LDH High Mg ²⁺ Low total protein High folate
Incorrect container or anticoagulant	No enzyme inhibitor. EDTA tube contamination.	Low glucose High K ⁺ , Low Ca ²⁺ Low ALP (if EDTA used)
Lipaemia	Taken before intra-lipid is cleared. Taken after fatty meals; anxiety and stress	Interferes with many due to turbidity of sample. May cause low Na ⁺
Contamination of blood by infused fluids	High MW dextrans. Dextrose. Crystalloid solutions.	Elevated proteins High glucose Spurious Na ⁺ , K ⁺ , Cl ⁻ , etc. Low Ca ²⁺ , high Na ⁺
Bubbles in blood for arterial gases	Leaking syringe/needle junctions. Inadequate stoppering of syringe in transit. Incorrect draw procedure.	Low pCO ₂ Increased pO ₂

NOTE:

False low results may occur in a range of clinical chemistry tests in specimens drawn from patients treated with N-acetylcysteine (NAC) - the accepted antidote to paracetamol toxicity. This is due to the interference of NAC in affected assays. Patients being treated with metamizole /dipyrone / novaminosulfone are also affected but these products are not licensed for use in the UK.

Patients should therefore not undergo clinical chemistry tests whilst on NAC - blood for these tests should be taken before treatment with NAC is started. If this is unavoidable, then laboratory staff should be informed.