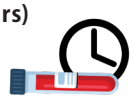
THE PATHCARE NEWS

IS IT HYPERKALAEMIA OR PSEUDOHYPERKALAEMIA?

Hyperkalaemia, defined as a potassium concentration greater than the reference interval, is a common electrolyte disorder that requires urgent attention. As both hyperkalaemia and hypokalaemia can have serious implications, it is imperative that the result obtained is a true reflection of the disease state.

Several factors can lead to a falsely elevated potassium concentration (pseudohyperkalaemia). These can be divided into factors associated with specimen collection and stability, and patient-related factors (associated with disease states). See table below.

NB: In patients with hypokalaemia, these factors may result in a falsely normal result.

FACTOR	MECHANISM	RECOMMENDATION
RELATED TO SAMPLE COLLECTION / STORAGE		
Delayed separation of serum from cells (> 4 hours) 	Potassium leaks from cells due to energy depletion	Samples should be centrifuged within 4 hours. Please contact the transport department as soon as the sample is collected.
Sample placed on ice or in a fridge 	Cold temperatures inhibit the Na/K pump, resulting in potassium leakage from cells	Please contact the transport department as soon as the sample is collected.
Haemolysis, due to e.g., fine gauged needle; high pressure on syringe, etc. 	Haemolysis, with release of intracellular potassium, results in significant increases in serum potassium, proportional to the degree of haemolysis	Vacuum tube systems, with correct needle gauge, creating minimal pressure on the draw are recommended
Tube additives, e.g., K-EDTA (purple top tube); NaF/K-Oxalate (grey top tube) 	Additives contain K salts and will result in significantly high K values (K >8), depending on the amount of contaminant present	Follow the recommended order of draw: blood culture tubes, sodium citrate, serum, heparin, EDTA, and sodium fluoride tube
Alcohol and povidone iodine 	Povidone has been shown to increase K by 1mmol/L (unknown mechanism). When ethanol antiseptics are not allowed to dry completely, cell disruption may result	Avoid phlebotomy in areas treated with povidone. Allow alcohol antiseptic to dry completely before phlebotomy
PATIENT-RELATED CAUSES		
Platelet count > **500** x10E9/L 	Leakage of potassium from platelets into serum during the clotting process (yellow top tube)	Use a plasma sample (green top tube), or do a blood gas
White blood cell count > **50** x10E9/L 	Leakage of potassium from white blood cells into serum. May be seen in patients with leukaemia (increased membrane fragility)	Do a blood gas