Q15 September 2009
Describe the mechanism of action and duration of effect of drugs used to lower potassium in hyperkalaemia.

Drugs that eliminate body K^+

Loop diuretics e.g. frusemide

- Inhibition of the $Na^+/K^+/2Cl^-$ cotransporter on luminal membrane of the thick ascending Loop of Henle
- This causes loss of normal positive charge in lumen, leading to the loss of paracellular resorption of K^+
- Net result is K^+ excretion
- Elimination half-life 45-9 mins

Cation exchange resins e.g. sodium polystyrene sulfonate

- Not absorbed in GI tract
- Causes net exchange of potassium for sodium in the intestinal lumen
- Onset of action: 1 hr PR, 4-6hrs PO
- Duration: variable

Drugs causing increased intracellular uptake of K^+

Insulin/glucose

- Stimulates cellular potassium uptake by activating the Na^+/K^+ ATPase pump
- Onset: 20-30 mins
- Duration: 2-6 hours (prolonged if i.v. infusion)

Sodium bicarbonate

- Alkalosis increases the activity of the Na^+/K^+ ATPase pump, increasing K^+ uptake
- Onset: 30-60 mins
- Duration: 2-3 hours

β_2 agonists e.g. salbutamol

- Stimulation of β_2 receptors on muscle cells stimulates Na^+/K^+ ATPase pumps
- Onset: 30 mins
- Duration: 2-3 hours

i.v. fluid

- Causes haemodilution
- Can increase renal excretion of K^+ by increasing renal perfusion and increasing urine output