general:
- techniques of RRT may be judged on the basis of:
  (i) haemodynamic side effects
  (ii) ability to control fluid status
  (iii) biocompatibility
  (iv) risk of infection
  (v) uraemic control
  (vi) avoidance of cerebral oedema
  (vii) ability to allow full nutritional support
  (viii) ability to control acidosis
  (ix) absence of specific side effects
  (x) cost

haemodialysis or CRRT techniques should be considered for serious toxic ingestions of:
- alcohol
- chloral hydrate
- barbiturates
- ethylene glycol (significant ingestion, >2.5mg/dL, ARF, CRF)
- methanol
- lithium (>4.0mmol/L, ARF, CRF: Failure to decrease 20% at 6 hours)
- salicylates (>120mg%, initially, >100mg% at 6 hours)

water removal - the removal of unwanted solvent (water) is therapeutically as important as the removal of unwanted solutes (acids, uraemic toxins, potassium)
during RRT water is removed through a process called ultrafiltration requiring a driving pressure to move fluid across a semi-permeable or intermittent haemodialysis) or by increasing the osmolarity of the dialysate (as in peritoneal dialysis)

solvent removal - the removal of unwanted solute can be achieved by
1. creating an electrochemical gradient across the membrane by using a flow past system with a toxin-free dialysate (diffusion) as in intermittent HD and PD
2. creating a 'solvent drag' driven by transmembrane pressure where solute moves together with solvent (convective) across a porous membrane, is discarded and then replaced with toxin-free replacement fluid (as in haemofiltration)
- the rate of diffusion of a given solute depends on its molecular weight, the porosity of the membrane, the blood flow rate, the dialysate flow rate, its binding to proteins and its concentration gradient across the membrane
- standard low flux cellulose based membranes do not allow middle molecules of greater than 500 daltons to be removed while synthetic high flux membranes have a cut off of 20-30 kDa

haemoperfusion - during haemoperfusion, blood is circulated through a circuit similar to the one used for CVVH; however, a charcoal cartridge is perfused with blood instead of a dialysis membrane
- charcoal microspheres effectively remove molecules of 300-500 daltons in size including some lipid soluble and protein bound substances
- problems include:
  (i) the large priming volume of the cartridge (260mL) can cause hypotension of the patient is hypovolaemic
  (ii) glucose absorption is significant and hypoglycaemia can be common
  (iii) thrombocytopenia can be common
  (iv) the need for heparinisation to prevent filter clotting
- no trials demonstrate a benefit for haemoperfusion; however it is useful in serious overdoses of:
  (i) theophylline (acute >440mcmol/L, chronic >330mcmol/L; lower threshold if age >60, IHD, seizure)
  (ii) barbiturates
  (iii) phenytoin
  (iv) carbamazepine

plasmapheresis or plasma exchange - plasma is removed and exchanged with FFP and mixture of colloid and crystalloid solutions
- a plasmafilter (a filter that allows passage of molecules up to 500kDa) is used instead of a haemofilter in the CVVH circuit & the plasma is discarded