Methanol and Ethylene Glycol Poisoning

With both of these poisons it is the toxic metabolites brought about by the action of Alcohol Dehydrogenase that cause the clinical syndrome and treatment strategies concentrate on slowing or inhibiting this reaction.

Methanol

Methanol is found in various solvents, antifreeze and screenwash, and can cause problems via ingestion, inhalation and skin absorption. It is metabolised slowly and onset of symptoms can be insidious.

Minor poisoning often presents with headache and photophobia. More severe poisoning results in abdominal pain, decreased conscious level, blurred vision (caused by papilloedema, which may progress to optic atrophy), and eventually coma. There is profound metabolic acidosis with an increased anion gap

Management does not include charcoal as it does not absorb methanol. A plasma methanol level is needed, usually not available locally. As well as ABGs measure calcium, and correct acidosis to pH>7.2 with bicarbonate-large volumes so beware hypernatraemia. Treat low calcium with IV calcium supplements slowly.

Antidotes include ethanol (oral or IV) which competes with the poison for enzymatic metabolism, and fomepizole, which inhibits alcohol dehydrogenase, though it is not licensed for methanol poisoning.

Ethylene Glycol

Similarly, the toxic metabolites cause the symptoms, which come on rapidly as ethylene glycol is rapidly absorbed from the gut. Ataxia, dysarthria, nystagmus, vomiting and haematemesis can progress to convulsions, coma and severe metabolic acidosis. These are early features.
Tachycardia, tachypnoea, hypertension, pulmonary oedema and cardiac failure can develop at 12-24 hours, and later ATN, oliguria and hypocalcaemia.

Charcoal is again not indicated. Measure plasma levels of ethylene glycol, and calcium and keep pH above 7.2

Ethanol Therapy

Oral therapy-use 40% alcohol (available from your local off license) and load with 2ml/Kg.
If loading with IV ethanol use7.5 ml/Kg of 10% over 30 minutes
See toxbase for ongoing infusions

Haemodialysis (or peritoneal) may also be necessary

Fomepizole

Brand name Antizol it is not widely available, nearest stock in the NW is at Whiston hospital in A&E. Adult dose- load with 15mg/Kg followed by bd dosing.
Toxbase gives more info and a host of references

Anion Gap- for those who want the revision

Anion gap= (Na+k) – (HCO_3+Cl)
Normal is 10-18 mmol/L

It is normal in hyperchloraemic acidosis wherebicarb is lost via the gut or kidneys eg diarrhoea, some forms of RTA

It is increased in most of the common causes of acidosis we see in the A&E dept e.g.poisoning(salicylate, methanol, ethylene glycol) Ketoacidosis(Dibetes, alcohol poisoning) lactic acidosis