Toxic Alcohol Treatment

**Recommended laboratory investigations** required to calculate an anion gap and osmolar gap.
*ideally these labs are all drawn at the same time*

1. Venous blood gas (arterial acceptable)
2. Lactate
3. Chemistry: Na+, K+, Cl, HCO3, creatinine, BUN, amylase, glucose
4. Serum osmolality
5. Serum ethanol
6. Toxic alcohol levels: methanol, ethylene glycol, isopropanol, acetone, propylene glycol
   - Note that ethylene glycol may need to be ordered separately in addition to a “Toxic alcohol” or “Volatile” screen – depending on the local laboratory

**Calculations:**

<table>
<thead>
<tr>
<th>Formula</th>
<th>Abnormal</th>
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<tbody>
<tr>
<td>Anion Gap = Na – (Cl + HCO3)</td>
<td>&gt;12</td>
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<tr>
<td>Calculated Osmolality (using SI units) = (Na x 2) + Urea + Glucose + (Ethanol (mmol/L) x 1.25)</td>
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<tr>
<td>Osmolar Gap = Measured Osmolality – Calculated Osmolality</td>
<td>&gt;10</td>
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**Interventions:**

**Alcohol Dehydrogenase (ADH) Blocker**
- Fomepizole (4-methylpyrazole, or 4-MP) is the preferred antidote for toxic alcohol poisoning. Indications for antidote treatment with fomepizole are evaluated on a case-by-case basis with the toxicologist on-call. Ethanol (PO or IV) is an alternative antidote, but is only considered if fomepizole not available.
- **Fomepizole dosing:**
  - loading dose of 15mg/kg IV
  - then 10mg/kg IV q12h for the first 48 hours, after which the dose is increased to 15mg/kg IV q12h
  - during dialysis dosing interval changes to q4h
  - Note: if patient has co-ingested ethanol, fomepizole can be delayed until the serum ethanol falls to < 23mmol/L.

**Cofactors**
- Folinic acid (Leucovorin®) 1-2 mg/kg IV infusion (adult or peds) over 30 minutes q4-6h
  - For any potential toxic alcohol ingestion
  - Until Methanol level is negligible and acidosis resolved
  - Note: Folic acid (1-2 mg/kg IV q4-6h (adult or peds) may be used instead of leucovorin if necessary
- Thiamine 100 mg IV by slow push (adult) (peds: 50 mg IV) q8h
  - Consider if patient is a chronic alcoholic or the toxic alcohol could be Ethylene Glycol & no level yet available
- Pyridoxine 50 mg IV by slow push (adult & peds) q6h
  - If the toxic alcohol could be Ethylene Glycol & no level yet available until Ethylene Glycol level is negligible

Correct acidosis with a bicarbonate infusion to target serum pH > 7.2.

Dialysis recommendations to be made in consultation with the on-call toxicologist.