**Digoxin**

**Preparation:**
- **Absorption:** Rapid
- **Distribution:** Volume of distribution approximately 0.5 L/kg
- **Metabolism:** Hepatic
- **Excretion:** Renal

**Clinical findings (TOXIDROME):**
- **Intoxication:** Cardiopulmonary, renal, brain and heart.
- **Calcium oxalate crystals:**
  - **Neuro:** Increased automaticity
  - **GIT:** NMDA receptor antagonism
  - **Coronary:** Vasoconstriction

**Clinical findings:**
- **Stimulates release of:**
  - Sympathetic nicotinic effects:
    - Mitosis, salivation, urinary incontinence, vomiting
    - Lethargy, seizures
- **CNS:**
  - Dihydropyridines predominantly cause the latter.
  - CVS:
    - Resp: Nausea, vomiting and abdominal pain
    - Bradycardia due to SA block, tachycardia due to AV node depression, impaired contractility and vasodilation.
    - Metabolic: Hypocalcaemia
- **Respiratory:**
  - Bronchospasm, pulmonary oedema
  - Tinnitus, hearing loss, vertigo, seizures, cerebral oedema
  - Hypoventilation

**Investigations:**
- **CXR**
- **Respiratory acidosis**
- **Lactate**
- **Drug levels**

**Laboratory findings:**
- Plasma digoxin level > 1.2 ng/mL.
- Plasma digoxin level > 2 ng/mL: seizures.
- Plasma digoxin level > 5 ng/mL: ventricular tachycardia, arrhythmias.

**Drug treatment:**
- **Activated charcoal**
- **Gluconate**
- **Digoxin-Fab**
- **Ethanol**
- **Dialysis**

**Supportive care:**
- **Antidotes for arrhythmias:**
  - Calcium gluconate
  - Dicobalt ETD
- **Pacing:**
  - Verapamil
  - Carvedilol
- **Antidotes for conduction disturbance:**
  - Sotalol, flecainide
  - Flecainide, amiodarone

**Resuscitation:**
- **Airway:**
  - Supportive care and monitoring
  - Intubation
- **Breathing:**
  - Investigations — screening (ECG, BSL and paracetamol) and specific
  - Investigations for ECG
- **Circulation:**
  - Decontamination
  - Enhanced elimination
  - Antidotes
  - Disposition (no psychiatric referral)

**Dialysable Drugs**
- **(an incomplete but useful list)**
  - **V:** Barbituates
  - **L:** Lithium
  - **A:** Aminoglycosides
  - **S:** Sotalol / Atenolol
  - **T:** Theophylline
  - **E:** Ethylene glycol
  - **M:** Methanol
<table>
<thead>
<tr>
<th>TOXIDROME</th>
<th>TOXICITY</th>
<th>DRUGS</th>
<th>RISK ASSESSMENT</th>
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<tbody>
<tr>
<td>Iron overload</td>
<td>GI oedema, diarrhoea, vomiting</td>
<td>Fe tablets</td>
<td>Fe infusion</td>
<td>PRBC ≥ 60 mg/kg elemental iron dose</td>
<td>Whole Bowel Irrigation</td>
<td>May be helpful to remove desferroxamine-Fe complex in patients with severe renal failure</td>
<td>Desferroxamine 15 – 40 mg/kg/hr for 6 – 24 hours</td>
<td>Desferroxamine works when iron is extracellular so needs to be early</td>
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<tr>
<td>Methaemoglobinemia</td>
<td></td>
<td>metoclopramide</td>
<td>dopamine</td>
<td>nitrates (SNP, NOG, GTN)</td>
<td>Co-oximetry</td>
<td>Not helpful</td>
<td>Not helpful</td>
<td>Methylene blue 1-2 mg/kg</td>
</tr>
<tr>
<td>Methanol</td>
<td></td>
<td>Fomepizole (inhibits alcohol dehydrogenase)</td>
<td>15mg/kg loading then 10 mg/kg BD (Q4h if on dialysis)</td>
<td>Caution in: G6PD (no NADPH to activate drug and causes haemolysis), Nitrite induced MetHb (to treat CN)</td>
<td>Abdominal pain</td>
<td>Not helpful</td>
<td>Fomepizole not currently available in Australia</td>
<td></td>
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<tr>
<td>Paracetamol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Paracetamol level</td>
<td>Activated charcoal effective within 1 hour but risks considered in light of highly effective antidote</td>
<td>Not helpful</td>
<td>N-acetylcysteine 150 mg/kg over 1hr 50 mg/kg over 4hr 100 mg/kg over 16hr</td>
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<tr>
<td>Tricyclic antidepressants</td>
<td></td>
<td>Amitryptiline</td>
<td>Noraptenpal</td>
<td>Trimipramine</td>
<td>ECG</td>
<td>Activated charcoal for ingestions &gt; 10mg/kg indicated after airway secured</td>
<td>Not helpful</td>
<td>Nortriptilin 100 mM IV every 1-2 mins until ROSC Induction and hyperventilation Intravenous lidocaine 100 ml of 20% Lignocaine 1.5mg/kg DO NOT give clonazepam 4 or 8</td>
</tr>
</tbody>
</table>