# 40. Alcohol (Methanol) Poisoning Algorithm

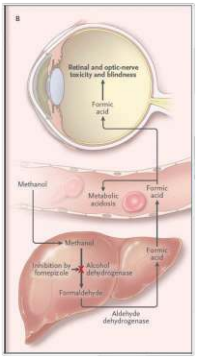
**This clinical pathway is intended to supplement, rather than substitute for, professional judgment and may be changed depending upon a patient's individual needs. Failure to comply with this pathway does not represent a breach of the standard of care.**

**Suspected Methanol Poisoning**

Methanol toxicity commonly affects the **neurological, ophthalmological**, and **gastrointestinal** systems

a) Within the **first 24 hours**, **central nervous system (CNS)** depression, euphoria, and inebriation occur.
b) This is followed by a **latent period (**between **6 and 30 hours)** during which methanol is **metabolize to formic acid,** which ultimately leads to systemic effects.
c) **Ophthalmologic symptoms** can range from blurry vision, decreased visual acuity, and photophobia to blindness or the classic "snowstorm" vision. A complaint of **blurred vision with a relatively clear sensorium** should strongly suggest the diagnosis of methanol poisoning. Initially, visual fields are not affected, and patients may have a central scotoma (blind spot). If unrecognized and not appropriately treated, these changes will result in;
   - permanent blindness,
   - absent papillary response, and
   - permanent optic nerve atrophy.
d) Methanol toxicity causes **gastrointestinal symptoms** such as abdominal pain with or without evidence of pancreatitis and/or hepatotoxicity.

In severe cases, the odour of formaldehyde may be present on the **breath** or in the **urine**. Untreated methanol poisoning is associated with a **rate of death** of **28%** and a rate of **visual deficits or blindness** of **30%** in survivors.




- Monitor, support ABCs; **Consider Advanced Airway or nursing in recovery position for airway protection**
- Check vital signs (BP, PR, RR, $SPO_2$, T°C, **RBS**).
  - Start Oxygen **IF** $SPO_2$ < 94%. Maintain $SPO_2$ **≥** 94%
  - If **Hypoglycaemic** (RBS < 3.3 mmol/L), give **50mls 50% dextrose IV** (**see 28. Hypoglycaemia Algorithm**). Also, give **100mg Thiamine IV** followed by 100mg PO BD for 6 weeks.
- Send samples for **FBC, UEC, LFTs, Lipase, VBG, toxicology**. Correct any electrolyte imbalances (**see 31: Electrolyte Abnormalities Algorithm**)
- **Start IV Fluids** – If hypotensive give repeated **NS/RL boluses at 20ml/kg** until perfusion is restored (MAP > 65) and dehydration is corrected. More rapid administration and large amounts of fluid may be needed in some patients. When stable, start **5% dextrose saline** infusion at **3L/24 hrs**
- Perform brief, targeted history, physical exam
- **DO NOT PERFORM GASTRIC LAVAGE.** If the patient's airway is protected, anecdotal evidence supports the use of gastric **aspiration** if large amounts of alcohol have been ingested and the patient can be treated very quickly (within an hour) after the ingestion.
- **DO NOT GIVE ACTIVATED CHARCOAL** unless the patient has co-ingested other poisons (**see 38. Poisoning** for indications and contraindications for activated charcoal)

**Give Ethanol (also see 38. Poisoning )**

Based on in vitro studies, ethanol's affinity for alcohol dehydrogenase is more than that of methanol by 15-fold and thus competes for the enzyme preventing methanol from being metabolized to the toxic metabolite, formic acid. Ethanol may be given orally or through an intravenous infusion.

**Oral Dose:**

**Loading dose:** 0.8g/kg in a 20% ethanol solution diluted in juice.
**Maintenance dose:** 80mg/kg/h; increase to maintain a serum ethanol concentration of 100- 150mg/dL.

**IV Dose:**

**Loading dose:** 0.6 - 0.8 g/kg in a 10% ethanol solution in D5W (volume/volume).

**Maintenance dose:**

80 to 130 mg/kg/h

Higher maintenance doses are used in patients with chronic alcoholism or during haemodialysis.

**Side effects of ethanol treatment include;** hypoglycaemia, CNS depression, intoxication, thrombophlebitis, and hypotension.

- **Consult a Physician**
- Monitor, support **ABCs, Vital signs** (BP, PR, RR, $SPO_2$, T°C, **RBS**), **UEC and VBG**.
- **Consider haemodialysis** for large methanol ingestions, severe metabolic acidosis (pH < 7.25-7.30), vision abnormalities, renal failure, electrolyte abnormalities not responsive to conventional treatment, haemodynamic instability refractory to intensive care treatment and serum concentration > 50mg/dL
- **Transfer to ICU**