



- **Ethylene glycol:** is a polyalcohol (glycol) containing more than one hydroxyl group (OH).
- **Main commercial uses of ethylene glycol include:**
 - Coolants (engine-cooling liquids).
 - Antifreeze (مضاد التجمُّد).
 - Softener for textiles (مُنْعِم الأقمشة).
- **Beside it is found in many commercial products, ethylene glycol has a sweet taste and an attractive color.**
- **Human ingestion of this poison is through:**
 - Suicide attempts.
 - Accidentally by children.
 - As an alcohol substitute (by alcoholics).
- **Poisoning potential:**
 - **A toxic dose is:** 0.5 ml/kg.
 - **A lethal dose is:** 1.4 ml/kg (for a 70 kg person, 98 ml of ethylene glycol is enough to cause death)
- The administration of this poison is usually by the enteral route and a rapid absorption occurs from the whole GI tract. To control this, gastric lavage (غسيل المعدة) can be done.
- **Distribution:** ethylene glycol is rapidly distributed in the total body water. volume of distribution is 0.6 – 0.8 L/kg.
- **Metabolism:** ethylene glycol is metabolized to glycolic acid and oxalic acid. Oxalic acid reacts with calcium ions to produce (calcium-oxalate crystals) which will cause damage to the kidney.
- **Treatment of ethylene glycol poisoning (ethanol and fomepizole):**
 - **Ethanol:**
 - ✓ **Metabolism:** ethanol is metabolized to acetaldehyde and then to acetate.
 - ✓ It competes with ethylene glycol for the same enzyme which has a greater affinity to ethanol (alcohol dehydrogenase) and thus ethylene glycol's metabolites are not formed.
 - **Fomepizole:**
 - ✓ It inhibits the formation of acetaldehyde and thus ethylene glycol's metabolites are not formed.
- **Elimination of ethylene glycol:**
 - In poisoned patients, ethylene glycol is metabolized within 3-6 hours by alcohol dehydrogenase to form the metabolites.
 - During treatment with ethanol and fomepizole, renal elimination of ethylene glycol occurs within 15-17 hours (hemodialysis).
- **Effects of ethylene glycol on the body:**
 - **Initial phase:** CNS depression (altered mental status).
 - **Cardiopulmonary phase:** within 12-24 hours (dyspnea).
 - **Renal phase:** within 25-36 hours (anion gap metabolic acidosis).

