



ศูนย์พิษวิทยารามาธิบดี

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล

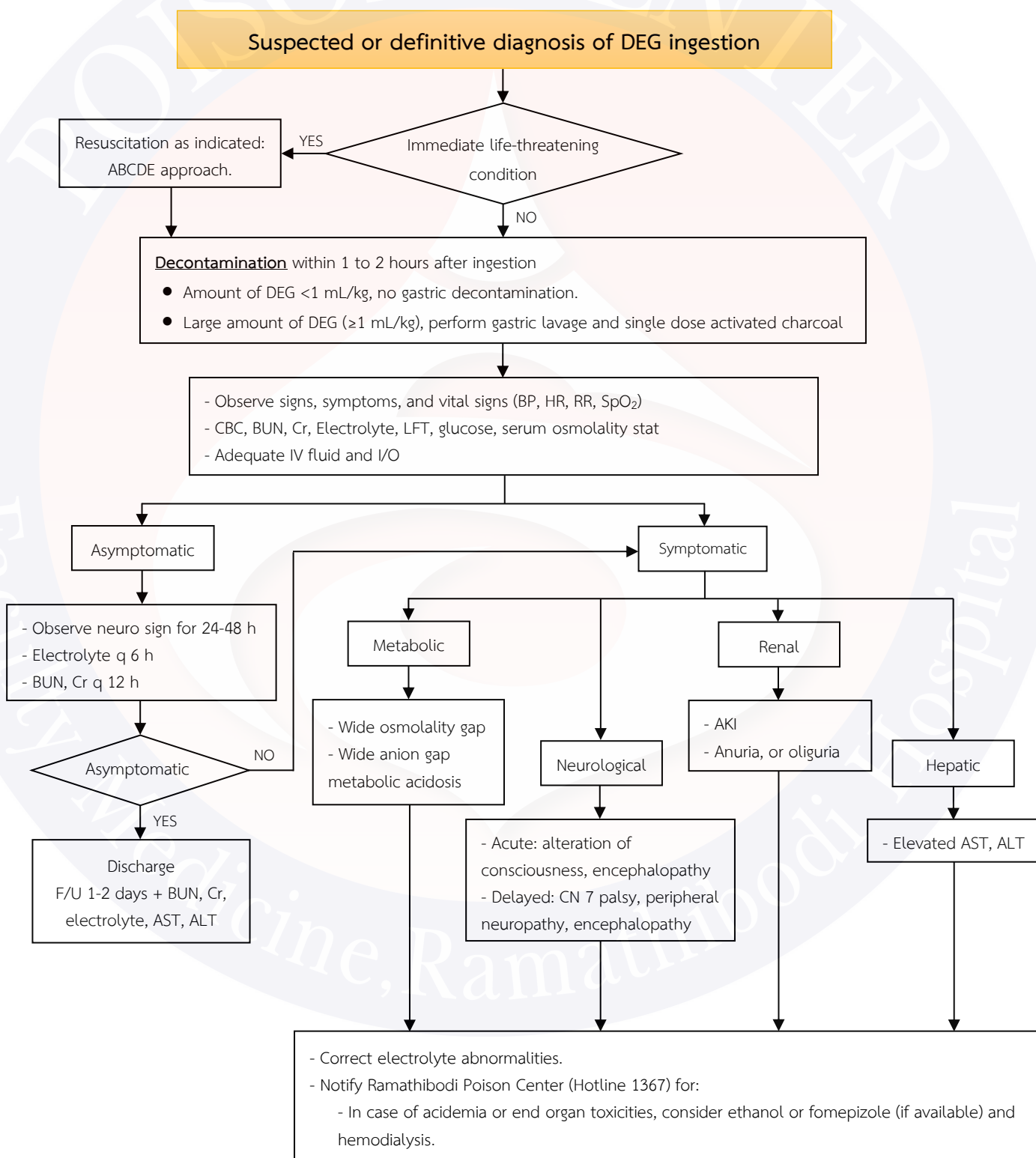
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แนวทางการดูแลผู้ป่วยภาวะพิษจาก ไดเอทิลีนไกลคอล (Management of Diethylene Glycol; DEG)





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Diethylene Glycol (DEG) Toxicity and Management

Toxic dose

- Rodent studies^[1]:
 - DEG Dose: up to 2 g/kg is minimally toxicity
 - DEG Dose: approximately 10 g/kg is significant toxicity
- Estimated acute lethal dose in humans is approximately 1 mL/kg^[2]

Clinical manifestations and toxicities

- Few hours after ingestion: lethargy, confusion, drunkenness, and altered mental.
- 8 to 72 h after exposure^[1,3-6]: Nephrotoxicity, acute kidney injury (AKI), elevations in hepatic aminotransferases^[1].
- 24-48 h (may be delayed to 5 days) after exposure^[1,3]: Unilateral or bilateral cranial nerve 7, 8 paresis or paralysis, peripheral neuropathy (axonal sensorimotor neuropathy with secondary demyelination is the typical clinical course), encephalopathy, autonomic nervous system instability, and coma

Osmolality gap

- Molecular weight of diethylene glycol = 106.12 g/mol
- Calculated serum osmolality (mOsm/L) = $(2 \times \text{Na [mEq/L]}) + (\text{BUN [mg/dL]}/2.8) + (\text{Glucose [mg/dL]}/18)$
- Osmolality gap = Measured serum osmolality - Calculated serum osmolality

Treatment

- Decontamination
 - It is reasonable to perform nasogastric lavage and administer activated charcoal within 1 to 2 h after ingestion for a large amount of liquid product containing DEG in order to try to remove unabsorbed DEG in the stomach.^[1]
 - Consider insertion of a nasogastric tube and aspiration of stomach contents after a large, recent (within an hour) ingestion. Administer activated charcoal for significant, recent ingestion.^[2]
- Alcohol dehydrogenase (ADH) inhibitor
 - Consider ADH inhibitor if clinical evidence of acidemia or end organ toxicities
 - Fomepizole:



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- For those patients presenting to health care facilities with an acidemia, oliguria or anuria within 24 to 36 h of a DEG ingestion, fomepizole is recommended in addition to emergent hemodialysis.^[1]
- For those patients presenting later than 36 to 48 h after a DEG ingestion with the aforementioned signs and symptoms, fomepizole and hemodialysis are recommended. Although the ability of these therapies to limit the damage of DEG and its toxic metabolites will be less (vs earlier implementation), it will be of value with regard to correcting electrolyte imbalances and managing AKI.^[1]
- Ethanol:
 - It is a reasonable alternative therapy if fomepizole is unavailable and a rapid transfer to another hospital is not possible.^[1]
- Enhanced elimination
 - Hemodialysis
 - Consider hemodialysis if clinical evidence of acidemia or end organ toxicities

Abbreviation: AKI = acute kidney injury, ALT = alanine aminotransferase, AST = aspartate aminotransferase, BP = blood pressure, BUN = blood urea nitrogen, Cr = creatinine, DEG = diethylene glycol, h = hour, HR = heart rate, LFT = liver function test, RR = respiratory rate

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