### EVIDENCE-BASED PRACTICE RECOMMENDATIONS

**Toxic Alcohols: Not Always A Clear-Cut Diagnosis**

Patil N, Lai Becker M, Ganetsky M. November 2010, Volume 12; Number 11  
*This issue of Emergency Medicine Practice focuses on the diagnostic approach to methanol, ethylene glycol, and isopropanol poisoning, as well as the pathophysiology, management, and treatment specific for each toxic alcohol. For a more detailed discussion of this topic, including figures and tables, clinical pathways, and other considerations not noted here, please see the complete issue on the EB Medicine website at www.ebmedicine.net/topics.*

<table>
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<th>Key Points</th>
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<td>Flank pain or urinary complaints suggests ethylene glycol intoxication. Blurry vision, changes in vision, or blindness suggest methanol toxicity. Abdominal pain or hematemesis suggests isopropanol poisoning.</td>
<td>In each case, the parent compounds cause intoxication, but serious toxicity is caused by their metabolites. Toxic alcohols should be part of the differential diagnosis of any patient with an elevated anion or osmolar gap, as well as any inebriated patient with a nondetectable serum ethanol concentration.</td>
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<td>Definitive diagnosis is verified by obtaining serum concentrations of methanol, ethylene glycol, or isopropyl alcohol. These levels are often not readily available and so the osmolar and anion gaps help in deciding treatment options. To properly interpret osmolar and anion gaps, these laboratory tests should be ordered at the same time and from the same blood sample: electrolytes, osmolality, ethanol level, and toxic alcohol concentrations.</td>
<td>Since the osmolar gap varies from person to person, its interpretation can often prove challenging. There are no robust data on when to suspect toxic alcohol ingestion on the basis of the osmolar gap. Hovda et al proposed that an osmolar gap of greater than 25 mOsm in the setting of acidosis should suggest toxic alcohol ingestion.</td>
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<td>Decontamination methods are not recommended unless co-ingestions are suspected.</td>
<td>Methods for gastrointestinal decontamination after an ingestion of toxic alcohols have not been well studied. According to the AACT guidelines, toxic alcohols are rapidly absorbed, so such decontamination is of little value.</td>
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<td>Treatment for ethylene glycol and methanol intoxication includes an alcohol dehydrogenase inhibitor. Fomepizole (4-methylpyrazole) has a better safety profile than ethanol and has become the standard of care.</td>
<td>When compared with ethanol, fomepizole has 8000 times the affinity for ADH. Its advantages over ethanol include easier dosing, more predictable kinetics, and fewer side effects. Its primary and significant disadvantage is its high cost (about $1,000 per 1.0-g vial).</td>
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<td>Hemodialysis should be considered when serum toxic alcohol concentrations exceed 50 mg/dL, regardless of renal functional status or the presence of acid-base abnormalities.</td>
<td>Recent studies and case reports suggest that hemodialysis may not be needed if treatment with fomepizole is started early after ethylene glycol ingestion and there is no evidence of acidemia or alterations in renal function. However, this practice will probably not be efficient for patients with methanol intoxication, since methanol’s half-life can reach to 54 hours.</td>
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<td>Children who ingest more than a taste of ethylene glycol or any amount of methanol are referred by poison control centers to the ED for evaluation.</td>
<td>In children 18 months to 4.5 years of age, a mouthful is between 5 and 10 mL and could potentially result in concentrations that exceed 20 mg/dL of either toxic alcohol.</td>
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*See reverse side for reference citations.*
REFERENCES

These references are excerpted from the original manuscript. For additional references and information on this topic, see the full text article at ebmedicine.net.


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