# ToxTidbits

Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

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**The Maryland Poison Center's Monthly Update: News, Advances, Information**


## Ol' Reliable: Review of Activated Charcoal

Activated charcoal (AC) is one of the main gastrointestinal decontamination strategies used in toxic ingestions. It is made by treating charcoal at high temperatures with a variety of oxidizing or activating agents, forming pores that adsorb xenobiotics and toxins.

Single-dose activated charcoal (SDAC) should be administered close to the time of ingestion, ideally within one hour from ingestion, to reduce absorption. To adsorb the substance, AC needs direct contact with the poison and thus becomes less effective as time progresses from the ingestion.[1] An additional dose of SDAC may be administered at any time after the initial dose if there is evidence or suspicion of prolonged absorption such as in the case of massive ingestions, delayed- or extended-release formulations, and in exposures where reabsorption can be prevented (e.g. substances that undergo enterohepatic recirculation). Multiple-dose activated charcoal (MDAC) differs from SDAC in that the main utility is increasing elimination as opposed to preventing absorption. MDAC enhances elimination by adsorbing the substance from the gastrointestinal fluids and eventually causes excretion in the feces. To maintain this effect, multiple doses of activated charcoal are required to continuously adsorb the substance and facilitate excretion.[2]

There are multiple considerations before administering AC. Emesis and aspiration pose the greatest risk, so each exposure requires an individualized risk assessment. Additionally, AC may bind to oral therapeutic medications given to the intoxicated patient and can obstruct visualization if endoscopy is required. AC is contraindicated in patients in need of endoscopy (e.g., caustic ingestion such as strong acids or alkali), at risk of aspiration, at risk of gastrointestinal perforation, who cannot protect their airway, or at risk of losing their airway protective reflexes.[3] Not all substances are adsorbed by AC; AC should not be used for caustic substances, toxic alcohols, hydrocarbons, ions, and most metals and metalloids (e.g. lithium, lead, iron). A nasogastric or orogastric tube should not be inserted without endotracheal intubation for the sole purpose of administering AC. Endotracheal intubation should not be performed for the sole purpose of administering AC unless the patient is at significant risk of life-threatening toxicity and if other treatment options are unavailable or nonexistent.[3]

SDAC is dosed as 1g/kg up to 50g per dose and can be repeated at any point following the initial SDAC if there is evidence or suspicion of ongoing absorption. MDAC is also dosed as 1g/kg up to 50g per dose but is repeated every four hours or at half-dose every two hours. AC may be mixed with other additives to enhance palatability such as soda or chocolate milk.

The Activated Charcoal in Clinical Toxicology Workgroup from the Clinical Toxicology Recommendations Collaborative recently published **updated recommendations on the use of activated charcoal in poisonings**, providing general considerations and poison-specific recommendations.

For more information or questions about the administration of activated charcoal, please call your local poison center at 1-800-222-1222.

## Did you know?

**To demonstrate the effectiveness of its adsorptive properties, French pharmacist Touery reportedly ingested several lethal doses of strychnine mixed with 15g of activated charcoal .[4]**

Strychnine is derived from the plant Strychnos nux-vomica and antagonizes glycine receptors in the spinal cord and brain stem, resulting in muscular spasms and rigidity that can be described as "conscious seizures."


References:

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2. Levy G. Gastrointestinal clearance of drugs with activated charcoal. N Engl J Med. 1982;307(11):676-678. doi:10.1056/NEJM198209093071109
3. Hoegberg LCG, Gosselin S, Buckley NA, et al. Recommendations from the Clinical Toxicology Recommendations Collaborative on the administration of activated charcoal in acute oral overdose. *Clin Toxicol (Phila)*. Published online March 30, 2026.
4. ANDERSEN AH. Experimental studies on the pharmacology of activated charcoal; adsorption power of charcoal in aqueous solutions. Acta Pharmacol Toxicol (Copenh). 1946;2(1):69-78. doi:10.1111/j.1600-0773.1946.tb02599.x



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