



Poison HOTLINE

1-800-222-1222

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Did you know

Iron is poorly adsorbed by activated charcoal (AC) and therefore AC is not recommended for single-substance iron exposures.

Other substances NOT effectively absorbed by AC include metals (such as iron and lithium), alcohols, acids or alkalis, or electrolytes (such as magnesium, potassium, or sodium) due to the polarity of these substances.

When AC is recommended, it can be helpful in adsorbing drugs in the gut so the drugs do not enter the body. When giving AC it is important to make sure it can be given safely and within a reasonable time period after the ingestion.

The IPCC cautions the use of activated charcoal in patients who may be at risk of or currently having signs of CNS depression, seizures or are unable to protect airway.

Acute Iron Toxicity

Iron is an essential element that is found in many over the counter (OTC) vitamins. Accidental iron toxicity is often seen in the pediatric population with ingestion of adult vitamin preparations, such as prenatal vitamins, that may contain various levels of iron. In the adult population, self-harm attempts are commonly the cause of severe acute iron toxicity. Ingestion of elemental iron at 40 mg/kg or higher is an amount that can lead to severe toxicity. Ingestions of 200 to 250 mg/kg (or more) of elemental iron can potentially be fatal.

Typically, the duodenum regulates the absorption of iron. In an overdose of iron, however, the caustic effects of iron on the intestinal mucosa allows iron to be directly absorbed and saturates the proteins that bind iron ions, allowing more free iron to circulate in the body. In toxic amounts, free iron causes a myriad of multiorgan effects. Prompt treatment of acute iron toxicity comes with improved chances of recovery and reduced risk of long-term damage.

The course of iron toxicity has 5 “classic” stages, though these may overlap or be absent in an individual patient. **Stage 1** is considered the gastrointestinal phase and occurs 0-6 hours post-ingestion and nausea, vomiting, abdominal pain are seen during this time. Those with mild to moderate ingestions may not experience any other stages and all patients who have a severe iron ingestion will experience this stage. **Stage 2** is the *latent phase* which is seen between 6-24 hours post-ingestion. This stage is an apparent recovery or cessation of symptoms. At this phase the free iron is circulating and entering the cells and causing damage. During this phase the patient may have metabolic acidosis, lethargy, tachycardia, and tachypnea. Laboratory reassessments during this stage are paramount. **Stage 3** is the shock and acidosis phase that can start a couple hours after ingestion or be delayed 12-24 hrs. Typically, the more severe the ingestion the earlier this phase begins. In this stage the GI symptoms recur along with shock, metabolic acidosis, coagulopathy, cardiomyopathy, hepatic dysfunction, and renal failure. **Stage 4** occurs between 12-96 hours post-ingestion and is characterized by liver failure due to hepatic uptake of large amounts of iron causing liver necrosis and failure. **Stage 5** occurs 2-8 weeks post-ingestion and is due to the healing of the injuries caused by the iron. These injuries include damage to the GI mucosa, strictures, and obstructions.

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