

## Hand Sanitizers: How Toxic Are They?

Hand sanitizers are commonly used in schools, workplaces, homes, hospitals and other public places. Community-based epidemiologic studies have shown that the use of hand sanitizers reduces illnesses in households and universities, and lowers absentee rates in schools. The Centers for Disease Control and Prevention (CDC) and other health care and public organizations have adopted recommendations to use hand sanitizers.

Most hand sanitizers contain ethanol, while some contain isopropyl alcohol. The concentration of alcohol in these products varies from 45% to 95%, with the most commonly used products in the range of 60-65%. Ingestions of toxic amounts of ethanol and isopropyl alcohol produce central nervous system depression ranging from inebriation to coma. Vomiting, respiratory depression, hypothermia, hypotension, and hypoglycemia (with ethanol; in infants and children) or hyperglycemia (with isopropyl alcohol) may also occur.

Emails and news stories have surfaced recently alleging that children have developed toxic effects from ingesting small amounts of hand sanitizers off of their hands. These accounts have resulted in questions to poison centers about whether they should be used in schools and other locations where children, and in some cases adults, frequent. While these products can be harmful if children ingest them in large quantities, they are safe when used in the correct amount and in the correct manner. From 1/1/2005 until 6/19/2007, there were 28,056 reports of ethanol-based hand sanitizer exposures reported to U.S. poison centers, 81% of which occurred in children less than 6 years old. There were no cases of major (severe) outcomes or deaths in children. Most children remain asymptomatic or develop mild symptoms such as oral irritation and gastric upset.

How much hand sanitizer would be dangerous? A hand sanitizer pump dispenses approximately 2.5 mL of liquid. If one pump of a 62% ethanol-containing hand sanitizer was ingested by an average 2 year old weighing 15 kg, a blood alcohol level of 17.3 mg/dL would be expected, considerably below a toxic level of 80-100 mg/dL. This same child would have to drink approximately 4-5 teaspoonfuls of the sanitizer to produce toxic effects requiring medical attention. Clearly, more than a lick of hand sanitizer would be necessary to produce significant toxicity.

### ***DID YOU KNOW THAT... there are reports of hand sanitizers being abused by adults?***

Because they contain alcohol, there is a potential for intentional ingestions of hand sanitizers by teens and adults. The Maryland Poison Center was consulted on a case of an inmate who ingested a large quantity of a hand sanitizer containing 62% ethanol, resulting in a blood alcohol level of 335 mg/dL. This case report was published in the New England Journal of Medicine (Doyon S, Welsh C. Intoxication of a prison inmate with an ethyl alcohol-based hand sanitizer. N Engl J Med. 2007 Feb 1; 356:529-30). A case report of a patient who drank an isopropyl alcohol-containing hand sanitizer while hospitalized can be found in that same issue. Facilities that have the product available should be suspicious if large quantities of hand sanitizers are missing.



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