



American College of Medical Toxicology

Physicians Specializing in the Care of Poisoned Patients

Energy Drinks

What is an energy drink?

Energy drinks are beverages that are marketed to enhance performance and boost energy. These usually contain various quantities of sugar, caffeine, guarana, taurine, ginseng and other proprietary ingredients. Energy drinks can be purchased at grocery stores, convenience stores and gas stations.

What is the difference between energy drinks and sports drinks?

Energy drinks contain stimulants, primarily caffeine, which is perceived to give a temporary boost in performance.

Sport drinks are fluids used for hydration during strenuous activity. They contain no stimulants, and primarily contain carbohydrates (sugar) and electrolytes (salt, potassium for example) to replace those lost and used during exercise.

What age group generally consumes these energy drinks?

Energy drinks are very popular among youth and are regularly consumed by 31% of 12- to 17-year-olds and 34% of 18- to 24-year-olds.

What are some of the ingredients found in energy drinks?

The main ingredient of importance in an energy drink is usually caffeine. Caffeine is a CNS (central nervous system) stimulant, and also has the ability to increase heart rate and blood pressure. While the caffeine concentration in an 8- to 12-oz. bottle is about 72 to 150 mg, the University of California Davis reports that larger-size bottles may contain as much as 294 mg. In comparison, Pepsi Cola has 38 mg of caffeine per 12-oz serving and coffee can have between 140-200 mg per 8- to 12- oz.

Other ingredients may include guarana, green tea extract and yerba mate, all of which contain caffeine. Other possible ingredients include ginseng, a mild stimulant, taurine (an amino acid that also is promoted for stimulant effects), and other vitamins and antioxidants.

How can these energy drinks be dangerous?

Energy Drinks can be dangerous in a variety of ways

- Dental decay - A study published in the journal *General Dentistry* revealed that high glucose (sugar) found in energy drinks has the potential to erode tooth enamel more than other drinks, including sodas, sports drinks and root beer.
- Energy highs and crashes - In a study that investigated the energy drink consumption by college students, 29 percent reported experiencing weekly highs and crash episodes (decreased energy). People who use energy drinks, especially teenagers, report poor sleep and increased inattention throughout the following day.
- Headaches and heart palpitations - In the same college study, 22 percent reported having headaches, and 19 percent had palpitations (racing heart) related to drinking the energy drinks.
- Dehydration/exercise related injuries – When energy drinks are used to the exclusion of water or a sport drink during vigorous exercise this may result in dehydration, weakness and fainting. Decreased sweating may also increase the risk of a dangerous increase in body temperature (hyperthermia). Caffeine in these products may impair the kidney's ability to conserve fluids therefore urinating out high amounts of water, contributing to dehydration. Complications of dehydration and hyperthermia include renal failure, muscle breakdown and heat stroke.
- Increased risk taking and higher risk of injury – Researchers found that if someone drinks six or more energy drinks a month, they have a three times greater risk of smoking cigarettes, abusing prescription drugs, or engaging in a serious physical fight. They are also twice as likely to abuse alcohol and smoke marijuana compared to people who don't drink energy drinks.

Why are energy drinks so dangerous when mixed with alcohol?

When alcoholic beverages are mixed with energy drinks, a popular practice among youth, the caffeine in these drinks can mask the depressant effects of alcohol. By masking the sedating effects of alcohol, the co-ingestion of an energy drink may result in increased alcohol consumption and increase the risk alcohol related complications and trauma. In fact, users of energy drinks mixed with alcohol often report feeling less drunk and better able to perform complex tasks, like driving. These people fail sobriety tests just as often as someone drinking alcohol alone, demonstrating that energy drinks are not a cure or a fix for the impairment in coordination, alertness, attention and judgment caused by alcohol. A person may feel less drunk but they are every bit as impaired.

Drinkers who consume alcohol mixed with energy drinks are 3 times more likely to binge drink (based on breath alcohol levels) and are also 3 times more likely to be taken advantage of sexually than those who do not consume energy drinks with alcohol.

Caffeine has no effect on the metabolism of alcohol by the liver and thus does not reduce breathe-alcohol concentrations or reduce the risk of alcohol-attributable harms.

Do energy drinks actually enhance performance?

It is thought that any increase in attention is attributed to caffeine only. Any benefit beyond that of simple caffeine has not been proven.

What are some of the symptoms that I should be concerned about?

Headache, chest pain, weakness, anxiety, racing thoughts, lightheadedness, fainting, tremors and seizure are all worrisome symptoms after the use of these products. Although use of an energy drink when mixed with alcohol may make an individual feel less intoxicated they are still impaired.

What should I do if I have these symptoms?

If you or anyone else has any of the above symptoms, or otherwise feels ill after the use of one of these products, they should discontinue use and seek further evaluation through their primary care provider or local hospital emergency department. Your local poison control center can also assist should you feel ill from the use of these products.

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