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Caffeine

What is caffeine?

Caffeine is a bitter substance that occurs naturally in more than 60 plants including:

- Coffee beans
- Tea leaves
- Kola nuts, which are used to flavor soft drink colas
- Cacao pods, which are used to make chocolate products

There is also synthetic (man-made) caffeine, which is added to some medicines, foods, and drinks. For example, some pain relievers, cold medicines, and over-the-counter medicines for alertness contain synthetic caffeine. So do energy drinks and "energy-boosting" gums and snacks.

Most people consume caffeine from drinks. The amount of caffeine in different drinks can vary a lot, but it is generally:

- An 8-ounce cup of coffee: 95-200 mg
- A 12-ounce can of cola: 35-45 mg
- An 8-ounce energy drink: 70-100 mg
- An 8-ounce cup of tea: 14-60 mg

What are caffeine's effects on the body?

Caffeine has many effects on your body's metabolism. It:

- Stimulates your central nervous system, which can make you feel more awake and give you a boost of energy
- Is a diuretic, meaning that it helps your body get rid of extra salt and water by urinating more
- Increases the release of acid in your stomach, sometimes leading to an upset stomach or heartburn
[<https://medlineplus.gov/heartburn.html>]
- May interfere with the absorption of calcium in the body
- Increases your blood pressure

Within one hour of eating or drinking caffeine, it reaches its peak level in your blood. You may continue to feel the effects of caffeine for four to six hours.

What are the side effects from too much caffeine?

For most people, it is not harmful to consume up to 400mg of caffeine a day. If you do eat or drink too much caffeine, it can cause health problems, such as:

- Restlessness and shakiness
- Insomnia [<https://medlineplus.gov/insomnia.html>]
- Headaches [<https://medlineplus.gov/headache.html>]
- Dizziness [<https://medlineplus.gov/dizzinessandvertigo.html>]

- Fast heart rate
- Dehydration [<https://medlineplus.gov/dehydration.html>]
- Anxiety [<https://medlineplus.gov/anxiety.html>]
- Dependency, so you need to take more of it to get the same results

Some people are more sensitive to the effects of caffeine than others.

What are energy drinks, and why can they be a problem?

Energy drinks are beverages that have added caffeine. The amount of caffeine in energy drinks can vary widely, and sometimes the labels on the drinks do not give you the actual amount of caffeine in them. Energy drinks may also contain sugars, vitamins, herbs, and supplements.

Companies that make energy drinks claim that the drinks can increase alertness and improve physical and mental performance. This has helped make the drinks popular with American teens and young adults. There's limited data showing that energy drinks might temporarily improve alertness and physical endurance. There is not enough evidence to show that they enhance strength or power. But what we do know is that energy drinks can be dangerous because they have large amounts of caffeine. And since they have lots of sugar, they can contribute to weight gain and worsen diabetes.

Sometimes young people mix their energy drinks with alcohol. It is dangerous to combine alcohol and caffeine. Caffeine can interfere with your ability to recognize how drunk you are, which can lead you to drink more. This also makes you more likely to make bad decisions.

Who should avoid or limit caffeine?

You should check with your health care provider about whether you should limit or avoid caffeine if you:

- Are pregnant [<https://medlineplus.gov/pregnancyandnutrition.html>] , since caffeine passes through the placenta to your baby.
- Are breastfeeding [<https://medlineplus.gov/breastfeeding.html>] , since a small amount of caffeine that you consume is passed along to your baby.
- Have sleep disorders [<https://medlineplus.gov/sleepdisorders.html>] , including insomnia.
- Have migraines [<https://medlineplus.gov/migraine.html>] or other chronic headaches.
- Have anxiety.
- Have GERD [<https://medlineplus.gov/gerd.html>] or ulcers [<https://medlineplus.gov/pepticulcer.html>] .
- Have arrhythmia [<https://medlineplus.gov/arrhythmia.html>] (a problem with the rate or rhythm of your heartbeat).
- Have high blood pressure [<https://medlineplus.gov/highbloodpressure.html>] .
- Take certain medicines or supplements, including stimulants, certain antibiotics [<https://medlineplus.gov/antibiotics.html>] , asthma medicines, and heart medicines. Check with your health care provider about whether there might be interactions between caffeine and any medicines and supplements that you take.
- Are a child or teen. Neither should have as much caffeine as adults. Children can be especially sensitive to the effects of caffeine.

What is caffeine withdrawal?

If you have been consuming caffeine on a regular basis and then suddenly stop, you may have caffeine withdrawal. Symptoms can include:

- Headaches
- Drowsiness
- Irritability
- Nausea
- Trouble concentrating

These symptoms usually go away after a couple of days.

Start Here

- Caffeine: How Much Is Too Much? [<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/caffeine/art-20045678?p=1>] (Mayo Foundation for Medical Education and Research)
Also in Spanish [<https://www.mayoclinic.org/es/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/caffeine/art-20045678?p=1>]
- Nutrition and Healthy Eating: Caffeine [<https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/caffeine/art-20049372?p=1>] (Mayo Foundation for Medical Education and Research)
Also in Spanish [<https://www.mayoclinic.org/es/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/caffeine/art-20049372?p=1>]
- Spilling the Beans: How Much Caffeine is Too Much? [<https://www.fda.gov/consumers/consumer-updates/spilling-beans-how-much-caffeine-too-much>] (Food and Drug Administration)
Also in Spanish [<https://www.fda.gov/consumers/articulos-para-el-consumidor-en-espanol/al-grano-cuenta-cafeina-es-demasiada>]
- Tired or Wired? Caffeine and Your Brain [<https://newsinhealth.nih.gov/2020/10/tired-or-wired>]  (National Institutes of Health)
Also in Spanish [<https://salud.nih.gov/recursos-de-salud/nih-noticias-de-salud/cafeinado-o-cansado>]

Related Issues

- Benefits of Coffee [<https://www.eatright.org/health/wellness/healthful-habits/benefits-of-coffee>] (Academy of Nutrition and Dietetics)
- Caffeine and Migraine [<https://americanmigrainefoundation.org/resource-library/caffeine-and-migraine/>] (American Migraine Foundation)
- Caffeine: How Does It Affect Blood Pressure? [<https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/expert-answers/blood-pressure/FAQ-20058543?p=1>] (Mayo Foundation for Medical Education and Research)
Also in Spanish [<https://www.mayoclinic.org/es/diseases-conditions/high-blood-pressure/expert-answers/blood-pressure/faq-20058543?p=1>]
- Effects of Mixing Alcohol and Caffeine [<https://www.cdc.gov/alcohol/about-alcohol-use/alcohol-caffeine.html>] (Centers for Disease Control and Prevention)
- Truth about Energy Drinks [<https://familydoctor.org/truth-energy-drinks/?adfree=true>] (American Academy of Family Physicians)
Also in Spanish [<https://es.familydoctor.org/la-verdad-sobre-las-bebidas-energizantes/?adfree=true>]

Clinical Trials

- ClinicalTrials.gov: Caffeine [<https://clinicaltrials.gov/search?intr=caffeine&aggFilters=status:not%20rec>]  (National Institutes of Health)

Journal Articles

References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: Paracetamol and Caffeine Combination in Pain Management: A Narrative Review.
[<https://www.ncbi.nlm.nih.gov/pubmed/40740590>]
- Article: Genotype-Drug-Diet Interactions in Metabolic Regulation: CYP1A2 rs762551 Modulates the Effect of...
[<https://www.ncbi.nlm.nih.gov/pubmed/40732913>]
- Article: The effects of mental fatigue and caffeine on basketball performance: insights...
[<https://www.ncbi.nlm.nih.gov/pubmed/40726020>]
- Caffeine -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Caffeine%22%5Bmajr%3Anoexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+1+Year%22+%5Bdat%5D+NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29+AND+free+full+text%5Bsb%5D+>]

Find an Expert

- National Institute of Environmental Health Sciences [<https://www.niehs.nih.gov/>] 
Also in Spanish [<https://www.niehs.nih.gov/health/scied/teachers/educacion>]

Children

- Caffeine (For Parents) [<https://kidshealth.org/en/parents/child-caffeine.html>] (Nemours Foundation)
Also in Spanish [<https://kidshealth.org/es/parents/child-caffeine.html>]

Women

- Caffeine in Pregnancy [<https://mothertobaby.org/fact-sheets/caffeine-pregnancy/>]
(Organization of Teratology Information Specialists)

Patient Handouts

- Caffeine in the diet [<https://medlineplus.gov/ency/article/002445.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/002445.htm>]
- Caffeine overdose [<https://medlineplus.gov/ency/article/002579.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/002579.htm>]



MEDICAL ENCYCLOPEDIA

Caffeine in the diet [<https://medlineplus.gov/ency/article/002445.htm>]

Caffeine overdose [<https://medlineplus.gov/ency/article/002579.htm>]

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