

Decoding caffeine: Benefits, risks and common myths from a medical toxicologist

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In the bustling world of academia—where late nights and early mornings are often the norm—caffeine reigns supreme as an elixir of productivity.

With March being Caffeine Awareness Month, The Daily set out to learn more about this ubiquitous stimulant with the help of Ryan Marino, assistant professor at Case Western Reserve University School of Medicine. As a medical toxicologist, Marino studies and treats the effects of different chemicals on the human body.

"If someone felt sick after taking too much caffeine and called Poison Control, that would be me," Marino explained. "And if someone ended up hospitalized for issues related to caffeine, then I would be the specialist who is called."

Read on to glean Marino's insights into some of the benefits, risks and misconceptions about caffeine.

What are some scientifically proven benefits of moderate caffeine consumption?

The primary benefit of caffeine consumption is in promoting wakefulness and alertness, actually serving as a "performance enhancing drug" that can improve cognitive performance (e.g., attention, reaction time, etc.). Beyond that, [caffeine consumption](#) has been associated with reduced risk of certain conditions like [heart disease](#), diabetes, dementia, Parkinson's disease, and even depression. It is important to note that these are not known to be direct effects of caffeine, but have been shown to be possible benefits. In medicine, caffeine is a very important treatment for [premature infants](#), and can be used to help with some other things like headaches.

Are there individual variations in how people respond to caffeine?

Everyone does respond differently to caffeine, and it may actually not be

beneficial for some people depending on any medical or [mental health conditions](#). People who consume caffeine can also develop tolerance to it, which can reduce the effects from taking it and can also lead to things like caffeine withdrawal.

What are some common misconceptions about caffeine that you often encounter?

Caffeine is a psychoactive drug, and so it can have risks including the risk of developing dependence and withdrawal. Like most substances, caffeine can be toxic in addition to having beneficial uses, and it is important to remember that there is such a thing as too much caffeine! It is easy to overdose on caffeine when consuming products like caffeine pills.

The biggest misconception I see is that many people believe caffeine (or specific caffeine products like coffee or tea) have specific health benefits or prevent disease. While there is a lot of evidence showing caffeine intake can be associated with health benefits, there is no evidence to make specific claims like "drinking coffee will prevent heart disease," and much of the time that health benefits like that are communicated in mainstream media, they may actually be referring to mice in a lab rather than anything related to humans at all!

Can you shed light on how caffeine consumption may impact mental well-being, and are there any misconceptions in this area?

Caffeine can have various effects on mood and other aspects of mental health. It can improve mood and functioning in the short term, but conversely the withdrawal can make those things worse. Too much caffeine is well-documented to disrupt sleep and increase symptoms of

anxiety. The best advice is to talk to your own medical providers about this, and to consume caffeine in moderation and remember that it may affect your mood (but also may not).

How does one determine a moderate and healthy level of caffeine consumption?

The general recommendation for adults is that up to 400 mg of caffeine (about 4 cups of coffee) per day is considered safe. It is recommended that children and pregnant people avoid excess caffeine as they may be more sensitive to its effects. If you notice symptoms like feeling jittery, heart racing, nausea and upset stomach, restlessness and insomnia, then you have likely consumed too much caffeine. More is not always better, and significant overdoses can actually be life threatening.

Are there any recent or emerging trends in caffeine research that you find particularly interesting?

It will be interesting to see whether the many suggested health benefits are really related to caffeine itself, to something specific to beverages like coffee or tea, and whether specific doses matter. It is also possible that we may discover that these effects are not directly from the caffeine itself but from another variable (like maybe people who drink tea are more health conscious or maybe people who drink caffeine are more likely to exercise more). My best advice is to take every headline with a grain of salt and continue to enjoy your caffeinated beverages (or not) in moderation.

Provided by Case Western Reserve University

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