

Serotonin

Serotonin is a chemical that carries messages between nerve cells in the brain and throughout your body. Serotonin plays a key role in such body functions as mood, sleep, digestion, nausea, wound healing, bone health, blood clotting and sexual desire. Serotonin levels that are too low or too high can cause physical and psychological health problems.

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Overview

What is serotonin?

Serotonin, also known as 5-hydroxytryptamine (5-HT), is a monoamine neurotransmitter. It also acts as a hormone.

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As a neurotransmitter, serotonin carries messages between nerve cells in your brain (your central nervous system) and throughout your body (your peripheral nervous system). These chemical messages tell your body how to work.

Serotonin plays several roles in your body, including influencing learning, memory, happiness as well as regulating body temperature, sleep, sexual behavior and hunger. Lack of enough serotonin is thought to play a role in [depression](#), [anxiety](#), mania and other health conditions.

Most of the serotonin found in your body is in your gut (intestines). About 90% of serotonin is found in the cells lining your gastrointestinal tract. It's released into your blood circulation and absorbed by platelets. Only about 10% is produced in your brain.

Serotonin is made from the essential amino acid tryptophan. An essential amino acid means it can't be made by your body. It has to be obtained from the foods you eat.

What does serotonin do in my body?

Serotonin plays a role in many of your body's functions:

- **Mood:** Serotonin in your brain regulates your mood. It's often called your body's natural "feel good" chemical. When serotonin is at normal levels, you feel more focused, emotionally stable, happier and calmer. Low levels of serotonin are

associated with depression. Many medications used to treat anxiety, depression and other mood disorders often target ways to increase the level of serotonin in your brain.

- **Digestion:** Most of your body's serotonin is in your GI tract where it helps control your bowel function and plays a role in protecting your gut. Your gut can increase serotonin release to speed digestion to rid your body of irritating foods or toxic products. Serotonin also plays a part in reducing your appetite while eating.
- **Nausea:** [Nausea](#) is triggered when serotonin is released into your gut faster than it can be digested. The chemical message is received by your brain, which you perceive as nausea. Many drugs used to reduce feelings of nausea and vomiting target specific serotonin receptors in your brain.
- **Sleep:** Serotonin, together with another neurotransmitter dopamine, plays a role in the quality of your sleep (how well and how long you sleep). Your brain also needs serotonin to make melatonin, a hormone that regulates your sleep-wake cycle.
- **Wound healing:** Serotonin is released by platelets in your blood to help heal wounds. It also causes the tiniest blood vessels, arterioles, to narrow, which slows blood flow and helps clots to form. This is an important process in wound healing.
- **Bone health:** Serotonin levels may play a role in the density of your bones. High levels of serotonin in your gut may play a role in making bones weak, which can lead to bone breaks (fractures) and [osteoporosis](#).
- **Sexual health:** Serotonin also plays a role — together with the neurotransmitter dopamine — in your desire for sex.

What problems are associated with low serotonin levels?

Low levels of serotonin may be associated with many health conditions including:

- Depression and other mood problems.
- Anxiety.
- [Sleep problems.](#)
- Digestive problems.
- Suicidal behavior.
- [Obsessive-compulsive disorder.](#)
- [Post-traumatic stress disorder.](#)
- [Panic disorders.](#)
- [Schizophrenia.](#)
- Phobias.

Scientists still have a lot to learn about the role of serotonin in the body and in disease.

What can cause low serotonin levels?

A low serotonin level usually has more than one cause. Technically, serotonin levels are low because:

- **Your body isn't producing enough serotonin.**
- **Your body isn't effectively using serotonin.** This can happen if you don't have enough serotonin receptors or the receptors aren't working as they should.

What can I do to increase serotonin levels?

Ways to increase serotonin levels include:

- Eating more tryptophan-containing foods.
- Getting more sunlight.
- Taking certain supplements.
- Getting more exercise and lowering your stress level.

Foods to increase serotonin levels

Many foods naturally contain tryptophan, the amino acid from which serotonin is made. You can try increasing your serotonin level by eating tryptophan-containing foods, such as:

- Salmon.
- Eggs.
- Cheese.
- Turkey.
- Tofu.
- Pineapples.
- Nuts, oats and seeds.

Eating foods high in tryptophan will not necessarily boost serotonin levels on its own. It's a complex process. Your body needs carbohydrates to release insulin, which is needed to absorb amino acids. Then even if tryptophan does get into your blood it has to compete with other amino acids to get absorbed into your brain. Scientists are still studying how eating tryptophan-containing foods possibly boosts serotonin levels.

Sunlight

Not getting enough exposure to sunlight can lead to the mood disorder [seasonal affective disorder](#) in some people. Try to get 10 to 15 minutes of sunlight each day to boost not only serotonin levels but vitamin D levels too. If you live in an area where you can't get natural sunlight, consider using light therapy to get that needed daily sunlight.

Supplements

Several dietary and herbal supplements also increase serotonin levels. These include:

- **Dietary supplement:** Tryptophan, probiotics and SAMe.
- **Herbal supplements:** These can include ginseng, [St. John's wort](#), Syrian rue and nutmeg.

Exercise

Regular exercise is known to increase serotonin levels. Thirty minutes of [aerobic exercise](#) five times a week plus two strength-training sessions per week can improve mood disorders and heart health.

What medications increase serotonin levels?

Serotonin or serotonin receptors are common targets of the pharmaceutical industry since many health conditions are affected by serotonin. Some of the more common medications that increase serotonin levels include the following.

Several different classes of [antidepressants](#) block the reabsorption and recycling of serotonin, allowing more to remain in the brain. Medications that work this way are selective serotonin reuptake inhibitors (for example, paroxetine [Paxil®]), serotonin-norepinephrine reuptake inhibitors (for example, venlafaxine [Effexor®]) and tricyclic antidepressants (for example, amitriptyline [Elavil®]). Another type of antidepressant, monoamine oxidase inhibitors (for example, phenelzine [Nardil®]) blocks an enzyme that breaks down serotonin.

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Many other medications, taken for many medical conditions, also increase serotonin. Some of these drugs include the triptan family of headache drugs, opioid pain relievers, dextromethorphan-containing cough suppressants and anti-nausea drugs.

What problems are associated with high serotonin levels?

[Serotonin syndrome](#) is a condition that happens when serotonin levels are increased too much. It usually happens if you increase the dose of a medication known to increase serotonin levels or take another drug known to increase serotonin.

Mild symptoms include shivering, heavy sweating, confusion, restlessness, high blood pressure, muscle twitches and diarrhea. Severe symptoms include high fever, seizures, fainting and abnormal heartbeat.

Serotonin syndrome can be fatal if it's severe and not caught early and treated quickly.



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Additional Common Questions

What's the difference between dopamine and serotonin?

Dopamine and serotonin are both neurotransmitters. This means they are chemical message carriers between nerve cells in the brain as well as to and from other areas of your body. Both are also considered the “happy hormones,” as they both play a role in positive mood and emotion. Serotonin is associated with happiness, focus and calmness. Dopamine is associated with rewards and motivation.

Dopamine and serotonin also share involvement in some mental health conditions, including depression and mood disorders.

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Dopamine and serotonin also have some distinct functions. Dopamine controls body movements and coordination. Serotonin helps regulate digestive functions including bowel function and appetite. Dopamine causes a feeling of hunger while serotonin suppresses that feeling. Dopamine is mostly stored in your brain while serotonin is found mostly in your gut.

Sometimes these neurotransmitters work together to stay in a careful chemical balance in your body. Sometimes an imbalance leads to an overproduction of the other neurotransmitter. Having too much or too little of either can cause physical and psychological symptoms.

A note from Cleveland Clinic

Serotonin plays a key role in such bodily functions as mood, sleep, appetite, anxiety, digestion, blood clotting and sexual desire. If you have a health condition that affects serotonin or is affected by serotonin, ask your healthcare provider what you need to know about serotonin. To prevent a swing in your body's serotonin level and to reduce the potential for drug interactions, don't stop taking your medications,

change your dose or take dietary or herbal supplements without first talking with your provider.

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