NIH Office of Dietary Supplements

Magnesium

Fact Sheet for Consumers

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What is magnesium and what does it do?

Magnesium is a nutrient that the body needs to stay healthy. Magnesium is important for many processes in the body, including regulating muscle and nerve function, blood sugar levels, and blood pressure and making protein, bone, and DNA.

How much magnesium do I need?

The amount of magnesium you need depends on your age and sex. Average daily recommended amounts are listed below in milligrams (mg):

Life Stage	Recommended Amount
Birth to 6 months	30 mg
Infants 7–12 months	75 mg
Children 1–3 years	80 mg
Children 4–8 years	130 mg
Children 9–13 years	240 mg
Teen boys 14–18 years	410 mg
Teen girls 14–18 years	360 mg
Men	400–420 mg
Women	310–320 mg
Pregnant teens	400 mg
Pregnant women	350–360 mg
Breastfeeding teens	360 mg
Breastfeeding women	310–320 mg

What foods provide magnesium?

Magnesium is found naturally in many foods and is added to some fortified foods. You can get recommended amounts of magnesium by eating a variety of foods, including the following:

- Legumes, nuts, seeds, whole grains, and green leafy vegetables (such as spinach)
- Fortified breakfast cereals and other fortified foods
- Milk, yogurt, and some other milk products

What kinds of magnesium dietary supplements are available?

Magnesium is available in multivitamin-mineral supplements and other dietary supplements. Forms of magnesium in dietary supplements that are more easily absorbed by the body are magnesium aspartate, magnesium citrate, magnesium lactate, and magnesium chloride.

Magnesium is also included in some laxatives and some products for treating heartburn and indigestion.

Am I getting enough magnesium?

The diets of most people in the United States provide less than the recommended amounts of magnesium. Men older than 70 and teenage girls are most likely to have low intakes of magnesium. When the amount of magnesium people get from food and dietary supplements is combined, however, total intakes of magnesium are generally above recommended amounts.

What happens if I don't get enough magnesium?

In the short term, getting too little magnesium does not produce obvious symptoms. When healthy people have low intakes, the kidneys help retain magnesium by limiting the amount lost in urine. Low magnesium intakes for a long period of time, however, can lead to magnesium deficiency. In addition, some medical conditions and medications interfere with the body's ability to absorb magnesium or increase the amount of magnesium that the body excretes, which can also lead to magnesium deficiency. Symptoms of magnesium deficiency include loss of appetite, nausea, vomiting, fatigue, and weakness. Extreme magnesium deficiency can cause numbness, tingling, muscle cramps, seizures, personality changes, and an abnormal heart rhythm.

The following groups of people are more likely than others to get too little magnesium:

- People with gastrointestinal diseases (such as Crohn's disease and celiac disease)
- People with type 2 diabetes
- People with long-term alcoholism
- Older people

What are some effects of magnesium on health?

Scientists are studying magnesium to understand how it affects health. Here are some examples of what this research has shown.

High blood pressure and heart disease

High blood pressure is a major risk factor for heart disease and stroke. Magnesium supplements might decrease blood pressure, but only by a small amount. Some studies show that people who have more magnesium in their diets have a lower risk of some types of heart disease and stroke. But in many of these studies, it's hard to know how much of the effect was due to magnesium as opposed to other nutrients.

Type 2 diabetes

People with higher amounts of magnesium in their diets tend to have a lower risk of developing type 2 diabetes. Magnesium helps the body break down sugars and might help reduce the risk of insulin resistance (a condition that leads to diabetes). Scientists are studying whether magnesium supplements might help people who already have type 2 diabetes control their disease. More research is needed to better understand whether magnesium can help treat diabetes.

Osteoporosis

Magnesium is important for healthy bones. People with higher intakes of magnesium have a higher bone mineral density, which is important in reducing the risk of bone fractures and osteoporosis. Getting more magnesium from foods or dietary supplements might help older women improve their bone mineral density. More research is needed to better understand whether magnesium supplements can help reduce the risk of osteoporosis or treat this condition.

Migraine headaches

People who have migraine headaches sometimes have low levels of magnesium in their blood and other tissues. Several small studies found that magnesium supplements can modestly reduce the frequency of migraines. However, people should only take magnesium for this purpose under the care of a health care provider. More research is needed to determine whether magnesium supplements can help reduce the risk of migraines or ease migraine symptoms.

Can magnesium be harmful?

Magnesium that is naturally present in food is not harmful and does not need to be limited. In healthy people, the kidneys can get rid of any excess in the urine. But magnesium in dietary supplements and medications should not be consumed in amounts above the upper limit, unless recommended by a health care provider.

The upper limits for magnesium from dietary supplements and/or medications are listed below. For many age groups, the upper limit appears to be lower than the recommended amount. This occurs because the recommended amounts include magnesium from **all** sources—food, dietary supplements and medications. The upper limits include magnesium from **only** dietary supplements and medications; they do **not** include magnesium found naturally in food.

Ages	Upper Limit for Magnesium in Dietary Supplements and Medications

Ages	Upper Limit for Magnesium in Dietary Supplements and Medications
Birth to 12 months	Not established
Children 1–3 years	65 mg
Children 4–8 years	110 mg
Children 9–18 years	350 mg
Adults	350 mg

High intakes of magnesium from dietary supplements and medications can cause diarrhea, nausea, and abdominal cramping. Extremely high intakes of magnesium can lead to irregular heartbeat and cardiac arrest.

Are there any interactions with magnesium that I should know about?

Yes. Magnesium supplements can interact or interfere with some medicines. Here are several examples:

- Bisphosphonates, used to treat osteoporosis, are not well absorbed when taken too soon before or after taking dietary supplements or medications with high amounts of magnesium.
- Antibiotics might not be absorbed if taken too soon before or after taking a dietary supplement that contains magnesium.
- Diuretics can either increase or decrease the loss of magnesium through urine, depending on the type of diuretic.
- Prescription drugs used to ease symptoms of acid reflux or treat peptic ulcers can cause low blood levels of magnesium when taken over a long period of time.
- Very high doses of zinc supplements can interfere with the body's ability to absorb and regulate magnesium.

Tell your doctor, pharmacist, and other health care providers about any dietary supplements and prescription or over-the-counter medicines you take. They can tell you if the dietary supplements might interact with your medicines or if the medicines might interfere with how your body absorbs, uses, or breaks down nutrients.

Magnesium and healthful eating

People should get most of their nutrients from food, advises the federal government's *Dietary Guidelines for Americans*. Foods contain vitamins, minerals, dietary fiber and other substances that benefit health. In some cases, fortified foods and dietary supplements may provide nutrients that otherwise may be consumed in less-than-recommended amounts. For more information about building a healthy diet, refer to the *Dietary Guidelines for Americans* and the U.S. Department of Agriculture's MyPlate.

Where can I find out more about magnesium?

- For general information on magnesium:
  - Office of Dietary Supplements Health Professional Fact Sheet on Magnesium
  - Magnesium in Diet, MedlinePlus®
- For more information on food sources of magnesium:
  - U.S. Department of Agriculture's (USDA) National Nutrient Database
  - Nutrient List for magnesium (listed by food or by magnesium content), USDA
- For more advice on buying dietary supplements:
  - Office of Dietary Supplements Frequently Asked Questions: Which brand(s) of dietary supplements should I purchase?
- For information about building a healthy diet:
  - MyPlate
  - *Dietary Guidelines for Americans*

Disclaimer

This fact sheet by the Office of Dietary Supplements provides information that should not take the place of medical advice. We encourage you to talk to your healthcare providers (doctor, registered dietitian, pharmacist, etc.) about your interest in, questions about, or use of dietary supplements and what may be best for your overall health. Any mention in this publication of a specific brand name is not an endorsement of the product.

Glossary

absorption

In nutrition, the process of moving protein, carbohydrates, fats, and other nutrients from the digestive system into the bloodstream. Most absorption occurs in the small intestine.

alcohol dependence

A chronic disease (it lasts a person's lifetime) in which a person is unable to stop drinking once he or she has begun, needs to drink larger amounts of alcohol to get high, and suffers withdrawal symptoms (such as nausea, sweating, shakiness, and anxiety) after stopping drinking. The risk of developing alcohol dependence is influenced by a person's genes and lifestyle. Also called alcoholism.

antibiotic

A drug used to treat infections caused by bacteria and other microorganisms.

blood sugar

The main source of energy used by the body's cells. Blood sugar comes from food and is made by the liver, and is carried to the cells through the bloodstream. Also called blood glucose.

bone density

A measurement of bone mass and an indicator of bone strength and health. Also called bone mineral density.

celiac disease

An autoimmune disorder in which eating gluten (a protein found in wheat, rye, barley, and possibly oats) causes the immune system to damage the small intestine, making it unable to absorb nutrients. It is a genetic disease that sometimes becomes active for the first time after surgery, pregnancy, childbirth, viral infection, or extreme stress. Also called sprue.

coronary heart disease

A disease in which the blood vessels (coronary arteries) that carry blood and oxygen to the heart are narrowed or blocked, which can cause chest pain, shortness of breath, and heart attack. It is usually caused by a build-up of fat and cholesterol deposits inside the arteries (atherosclerosis). Also called heart disease.

Crohn's disease

A long-lasting (chronic) disease that causes severe irritation in the gastrointestinal tract. It usually affects the lower small intestine (called the ileum) or the colon, but it can affect any part of the digestive tract from the mouth to the anus. It is painful, causing severe watery or bloody diarrhea, and may lead to life-threatening complications. Crohn's disease is a form of inflammatory bowel disease.

deficiency

An amount that is not enough; a shortage.

deoxyribonucleic acid

DNA. The molecules inside cells that carry genetic information and pass it from one generation to the next.

diabetes

A disease in which blood sugar (glucose) levels are high because the body is unable to use glucose properly. Diabetes occurs when the body does not make enough insulin, which helps the cells use glucose, or when the body no longer responds to insulin.

diarrhea

Loose, watery stools.

Dietary Guidelines for Americans

Advice from the federal government to promote health and reduce the chance (risk) of long-lasting (chronic) diseases through nutrition and physical activity. The Guidelines are updated and published every 5 years by the US Department of Health and Human Services and the US Department of Agriculture.

dietary supplement

A product that is intended to supplement the diet. A dietary supplement contains one or more dietary ingredients (including

vitamins, minerals, herbs or other botanicals, amino acids, and other substances) or their components; is intended to be taken by mouth as a pill, capsule, tablet, or liquid; and is identified on the front label of the product as being a dietary supplement.

diuretic

A drug or other substance that increases the amount of urine made by the body.

dose

The amount of medicine or other substance taken at one time or over a specific period of time.

fatigue

Extreme tiredness and an inability to function due to lack of energy.

fortify

To add nutrients to a food during processing or to replace nutrients lost when a food product is produced or stored. This process is sometimes called enrichment. For example, when calcium is added to processed orange juice, the orange juice is said to be "fortified with calcium." Another example is adding folic acid to flour.

fracture

A break, for example, a bone fracture.

gastrointestinal

GI. Having to do with the gastrointestinal tract (the large, muscular tube that extends from the mouth to the anus, where the movement of muscles and release of hormones and enzymes digest food).

health care provider

A person who supplies health care services. Health care providers include individuals with professional training (including doctors, nurses, technicians, and aides).

heart rhythm

The regular beating of the heart as it moves blood throughout the body.

high blood pressure

A blood pressure measurement of 140/90 mmHg (millimeters of mercury) or higher is considered high blood pressure (hypertension). Blood pressure is the force of blood pushing against the walls of the arteries. Blood pressure measurements are written as two numbers, for example 120/80. The first number (the systolic pressure) measures the pressure when the heart beats and pumps out blood into the arteries. The second number (the diastolic pressure) measures the pressure when the heart is at rest between beats. High blood pressure is a condition that occurs when a person's blood pressure often measures above 140/90 or regularly stays at that level or higher. This condition usually has no symptoms but can be life-threatening. It damages the arteries and increases the chance of stroke, heart attack, kidney failure, and blindness. Also called hypertension.

interaction

A change in the way a dietary supplement acts in the body when taken with certain other supplements, medicines, or foods, or when taken with certain medical conditions. Interactions may cause the dietary supplement to be more or less effective, or cause effects on the body that are not expected.

kidney

One of two organs that remove waste from the blood (as urine). The kidneys also make erythropoietin (a substance that stimulates red blood cell production) and help regulate blood pressure. The kidneys are located near the back under the lower ribs.

laxative

A substance that moves the bowels and relieves constipation.

magnesium

In nutrition, a mineral the body needs for normal muscles, nerves, and bones. It also helps keep a steady heart rhythm, a healthy immune system, normal blood sugar levels and blood pressure, and is involved in making energy and protein for the body. Magnesium is found in some foods, including green vegetables, beans and peas, nuts and seeds, and whole grains.

milligram

mg. A measure of weight. It is a metric unit of mass equal to 0.001 gram (it weighs 28,000 times less than an ounce).

mineral

In nutrition, an inorganic substance found in the earth that is required to maintain health.

multivitamin/mineral dietary supplement

MVM. A product that is meant to supplement the diet. MVMs contain a variety of vitamins and minerals. The number and amounts of these nutrients can vary substantially by product.

nausea

The uneasy feeling of having an urge to throw up (vomit).

nerve

A bundle of microscopic fibers that carries messages back and forth from the brain to other parts of the body.

nutrient

A chemical compound in food that is used by the body to function and maintain health. Examples of nutrients include proteins, fats, carbohydrates, vitamins, and minerals.

osteoporosis

A condition in which bones become weak and brittle, increasing the chance they may break.

peptic ulcer disease

A sore or hole in the lining of the stomach or the first part of the small intestine, causing burning pain in the gut. Most ulcers are caused by an infection with a type of bacteria called *Helicobacter pylori* (*H. pylori*); other causes include long-term use of nonsteroidal anti-inflammatory drugs (such as aspirin and ibuprofen), alcohol, and tobacco.

pharmacist

A person licensed to make and dispense (give out) prescription drugs and who has been taught how they work, how to use them, and their side effects.

prescription

A written order from a health care provider for medicine, therapy, or tests.

protein

A molecule made up of amino acids that the body needs for good health. Proteins are the basis of body structures such as skin and muscle, and substances such as enzymes and antibodies.

risk factor

Something that may increase the chance of developing a disease. For example, a diet that is low in calcium and vitamin D is a risk factor for osteoporosis; smoking is a risk factor for lung cancer.

seizure

Sudden changes in behavior caused by excessive electrical activity in the brain.

stroke

A loss of blood flow to part of the brain. Strokes are caused by blood clots or broken blood vessels in the brain, and result in damage to a section of brain tissue. Symptoms include dizziness, numbness, weakness on one side of the body, and problems with talking or understanding language. The chance (risk) of stroke is increased by high blood pressure, older age, smoking, diabetes, high cholesterol, heart disease, a family history of stroke, and a build-up of fatty material inside the coronary arteries (atherosclerosis). See also NIH publication: Know Stroke. Know the Signs. Act in Time. http://www.ninds.nih.gov/disorders/stroke/knowstroke.htm

symptom

A feeling of sickness that an individual can sense, but that cannot be measured by a healthcare professional. Examples include headache, tiredness, stomach ache, depression, and pain.

tissue

A group or layer of cells in a living organism that work together to perform a specific function.

urine

Excess liquids and wastes that have been filtered from the blood by the kidneys, stored in the bladder, and removed from the body through the urethra (the tube that carries urine from the bladder to outside the body).

vitamin

A nutrient that the body needs in small amounts to function and maintain health. Examples are vitamins A, C, and E.

zinc

A mineral found in most cells of the body. It helps enzymes work properly, helps maintain a healthy immune system, helps maintain the senses of taste and smell, and is needed for wound healing, making DNA, and normal growth and development during pregnancy, childhood, and adolescence. Zinc is found in some foods, including oysters, red meat, poultry, beans, nuts, certain seafood, whole grains, fortified breakfast cereals, and dairy products.

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