

# Know the Signs of B12 Deficiency and Top B12 Benefits

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## STORY AT-A-GLANCE

- › Pregnant women can ensure optimum health in their child by making sure they're not low in vitamin B12
- › Babies whose mothers had a B12 deficiency during pregnancy have increased odds of developing Type 2 diabetes as well as other serious metabolic problems later in life
- › Symptoms of low B12 levels include poor memory, shortness of breath, depression, yellow skin, a smooth tongue and tingling in your extremities
- › Vitamin B12 is an essential nutrient, meaning your body doesn't make it on its own, and it must come from food or supplementation
- › Vitamin B12 is helpful for metabolizing folate, carbohydrates and fat, helps to form red blood cells, produces adrenal hormones and is involved in many other body functions

***Editor's Note: This article is a reprint. It was originally published November 21, 2016.***

Pregnant women can optimize their child's health by making sure they're getting enough vitamin B12. A 2016 study revealed that babies whose moms had a B12 deficiency during pregnancy later have higher odds of developing Type 2 diabetes, as well as other serious metabolic problems.<sup>1</sup>

If you've ever gotten "that tired feeling" and general lack of energy, you likely have a vitamin B12 deficiency. It goes undetected for years; in fact, around 15% of the U.S. population has this condition.

Several seemingly unrelated symptoms, however, such as poor memory, shortness of breath, **loss of taste and smell**, depression and tingling in your extremities, could be an indication that getting your B12 levels checked is a good idea.

Interestingly, Mary Todd Lincoln, the wife of President Abraham Lincoln, who had a reputation for being emotionally and psychologically unbalanced, had these symptoms and several more that scientists theorize to be the reason for her behavior. Doctors of the time called it pernicious anemia, which is a B-vitamin-related malady.<sup>2</sup>

Found in animal-based foods such as eggs, milk, cheese, yogurt, meat, fish and poultry, vitamin B12, aka cobalamin, also comes in supplement form. It's called "essential" because your body can't produce it; it must come from an outside source.

## Why Is B12 Necessary?

Vitamin B12 is vital for many functions throughout your body. It plays a role in:

Adrenal hormone production	Folate metabolism <sup>3</sup>
Fat and carbohydrate metabolism	Red blood cell synthesis
<b>Iron absorption</b>	Proper blood circulation
<b>Reproductive health</b>	Digestion
Nervous system function	Nerve growth and function

## How Much Vitamin B12 Do You Need?

The National Institutes of Health's (NIH)<sup>4</sup> daily recommendation for vitamin B12 supplementation is as follows, with incrementally higher doses as children mature:

- 2.4 micrograms for people age 14 and older

- 2.6 micrograms for [pregnant women](#)
- 2.8 micrograms for [breastfeeding women](#)

But many people aren't getting enough. This one vitamin is responsible, at least in part, for making DNA, as well as red blood cells and nerves, says Harvard Health:<sup>5</sup>

*"And therein lies the problem: Some people don't consume enough vitamin B12 to meet their needs, while others can't absorb enough, no matter how much they take in. As a result, vitamin B12 deficiency is relatively common, especially among older people."*

You don't have to worry about a vitamin B12 overdose because it's water soluble, so "your body takes what it needs and flushes out the rest," according to The Washington Post.<sup>6</sup>

## **B12 Deficiency – A Vicious Cycle**

Ponnusamy Saravanan, Ph.D., associate clinical professor at the University of Warwick Medical School in the U.K., and senior author of the featured study, said scientists already knew that pregnant women with low B12 levels often have higher body mass index (BMI) and babies that have low birth weight.

Studies reveal these babies also have greater insulin resistance as children, which automatically sets up their potential for having Type 2 diabetes later in life.

The study team wondered if the symptoms shown in babies whose mothers were low in B12 had anything to do with [leptin](#), the so-called "satiety hormone" that triggers your realization when you're actually full.

Research shows that knowing when to stop eating is a crucial factor in maintaining a healthy weight. The problem occurs when overweight individuals' levels of leptin increase, which masks satiety, leading to constant overeating because they still "feel" hungry. This phenomenon is called leptin resistance.

It's a vicious cycle because even eating an adequate meal will not satisfy your hunger. So slowly, you gain more weight, become increasingly leptin resistant and, therefore, become more insulin resistant. Meanwhile, your risk of developing Type 2 diabetes escalates.

## **More Findings from the Study**

Saravanan's team analyzed 91 blood samples of mothers and their newborn babies to test their vitamin B12 levels. At the same time, they looked at their fat tissue samples and 83 tissue samples from placentas.

Sure enough, the scientists found that the babies belonging to moms with a vitamin B12 deficiency more often than not had leptin levels that were higher than normal. Saravanan explained:<sup>7</sup>

*"The nutritional environment provided by the mother can permanently program the baby's health. We know that children born to under or overnourished mothers are at an increased risk of health problems such as Type 2 diabetes, and we also see that maternal B12 deficiency may affect fat metabolism and contribute to this risk. This is why we decided to investigate leptin, the fat cell hormone."*

The scientists hypothesized that when B12 was not adequately represented in expectant mothers, the hormone responsible for programming the leptin gene in their babies was affected. While the researchers aren't sure which mechanisms determine this outcome, they have a few ideas.

The study's coauthor, Adaikala Antonysunil, associate professor and research fellow, said that either low vitamin B12 causes the fetus to accumulate fat, leading to more leptin, or the B12 deficiency changes the mother's genes that make the leptin.

Because B12 is involved in methylation reactions that affect whether genes are turned on and off, it's probably the latter. If they're right, the researchers believe the current U.S. recommendation for B12 levels for expectant moms needs to be increased.

## Signs of Vitamin B12 Deficiency

About 3.6% of U.S. adults suffer from vitamin B12 deficiency.<sup>8</sup> One of the hallmarks of deficiency is **fatigue**, as vitamin B12 plays a role in energy production and metabolism. **Anxiety and depression** occur as well, because vitamin B12 is a coenzyme in the synthesis of neurotransmitters that regulate your mood. Unless there's an intervention, low B12 levels even lead to **paranoia, delusions and hallucinations**. Other signs include:

A numb, tingly, "pins and needles" sensation in your hands, legs or feet, indicating possible nerve damage.

Yellow skin, an indication that your red blood cells are degrading, which releases a yellow pigment in the process.

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A swollen, "smooth" tongue with fewer papillae "bumps" containing taste buds. One patient recovered completely after receiving B12 treatment.<sup>9</sup>

Unstable, wobbly and dizzy sensations, which are signs there's not enough oxygen in your blood, related to low B12.

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Blurry or double vision, or shadows in your field of vision, caused by optic nerve damage from a B12 deficiency.

Memory loss, which is a red flag when it has no other possible cause.

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## What Causes a Vitamin B12 Deficiency?

There are a number of key reasons for a B12 deficiency, which doctors sometimes overlook. Individuals at risk for B12 deficiency include:

Vegetarians and vegans, as they don't get B12 from animal sources.

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People who regularly drink **alcohol**, because B12 is stored in your liver.

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Anyone with an autoimmune disease like Crohn's or celiac, which prevents your body from absorbing B12.

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People who drink more than four cups of coffee daily. They're shown to have around 15% less B vitamins, including B12, than non-coffee consumers.<sup>10</sup>

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Those who've had gastric bypass surgery and therefore have altered digestive systems.

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People exposed to nitrous oxide, aka laughing gas, which wipes out whatever B12 reserves you have in your body.

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Older adults, because as you grow older, your ability to produce intrinsic factor decreases. Intrinsic factor is a protein made by stomach cells that's necessary for B12 absorption. *H. pylori* (*Helicobacter pylori*) bacteria also destroy them, preventing B12 absorption.<sup>11</sup>

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People who take antacids, which interfere with B12 absorption over time.

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Patients who take Metformin for low blood sugar, as the drug interferes with B12 absorption.

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Anyone taking a proton-pump inhibitor like Prevacid or Nexium, or H2 blocker such as Pepcid or Zantac.<sup>12</sup>

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Vitamin B12 is present in its natural form only from animal sources. While vegans are urged to augment their B12 intake by stocking up on nutritional yeast, **coconut oil** and fortified coconut milk, a strict vegan or even vegetarian diet is not recommended. In fact, there are cases in which a deficiency causes brain abnormalities.

A deficiency is corrected by weekly shots of vitamin B12 or daily high-dose B12 supplements, and a mild case with a standard supplement or increased intake of vitamin B12-rich foods.<sup>13</sup> A more detailed list of the B12 in specific foods is found at NIH.<sup>14</sup>

## Sources and References

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