



Vitamins & Minerals

FOR THYROID HEALTH

For many people, an underactive or overactive thyroid is a serious burden. It can interfere with many of our bodily functions, affecting our mental and physical health in ways that can be confusing and alarming. But proper vitamin and mineral intake can help us prevent and manage hypothyroidism, and hyperthyroidism, so long as we know what we are doing.

What does our thyroid do?

Our thyroid is a part of our endocrine system. But what is our endocrine system? Quite simply: our endocrine system is a collection of all the glands in our body which produce hormones. Hormones are like the little messengers of our bodies. They are responsible for telling our cells when to grow and where to grow. They manage our sexual functions, our muscle mass, our appetite and, even though the brain is the part of us that tells them what to do, they can even influence our cognitive abilities and mood.

Our hormones do this by travelling and binding. Our glands make hormones, which are demanded by the brain, through neural connections. So if our liver needs a specific hormone, it will send an electric signal to the brain, which will send an electric signal to the right gland, which will then make that hormone. That hormone enters our bloodstream and travels in it until it reaches its destination in the liver. There, it will find a cell ready to receive it, they will bind together, and the job will be done. Sometimes the hormone will bond to an unrelated cell that was conveniently in the way, but generally these hormones find the organ that needs them the most.

Every gland makes a different sort of hormone, so we need all our glands to be in perfect working order to have all the hormones we need. But there is more. Our hormones are responsible for the growth, maintenance, and health of our glands too! This means that when one endocrine organ fails us, it's like a domino effect, with many of them failing in turn, because the hormones which supported them aren't there in the right amount any more. This in turn makes it difficult to correct a disorder once it has established itself, firstly because we have a lot more imbalance to fight, and secondly because it can be hard to detect these imbalances in the first place any more, due to the sheer number of symptoms we will be experiencing.

The thyroid is a gland found in our throat, underneath our voice box but above our collarbone. Often it is shaped like a butterfly, but this is no longer seen as necessary. A thyroid can have many different shapes and sizes, and although there is a correlation between some shapes and some disorders, it has now been concluded that no particular shape or size is guaranteed to cause thyroid diseases. A healthy thyroid produces a number of hormones known as T hormones, which are identified by numbers.

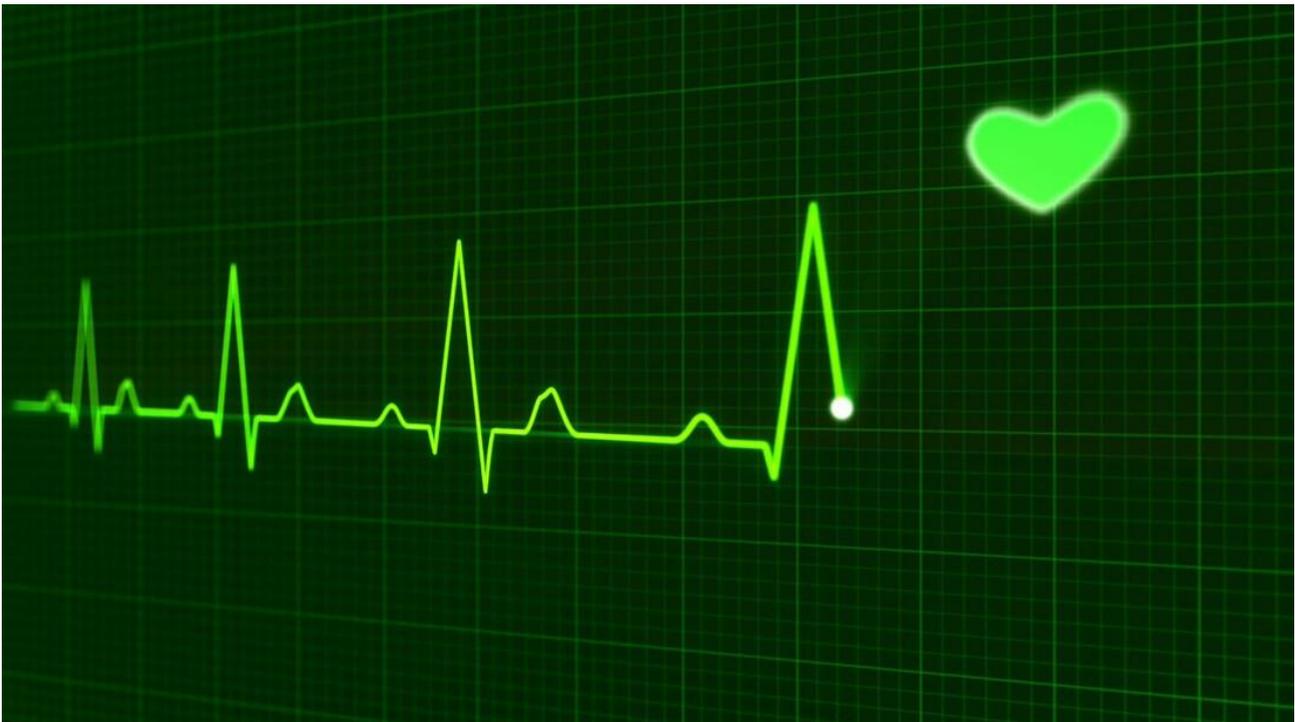
T3 is one of the most important hormones. This one is in charge of regulating the body's metabolism. Our thyroid needs iodine, several amino acids, selenium, and thyroid stimulating hormone to make thyroid hormones. If any of these components is missing, absorbed poorly, of low quality, or not recognized by the thyroid, we can produce little or no thyroid hormone. On the other hand, if the thyroid receives and uses too much of these components, our body can produce too much thyroid hormone. Both of these can be problems.

What is hyperthyroidism?

Hyperthyroidism is when our body produces too much thyroid hormone. This can result in a variety of ailments from simply an overactive metabolism, all the way to thyrotoxicosis,

where our thyroid is literally poisoning our bodies.

The symptoms of hyperthyroidism are varied, due to how much of your body is affected. On a physical and mental level, the first thing you will notice is tiredness. But you may also experience other symptoms. Eye problems can happen long before other symptoms, and may continue for months into your treatment. Your eyes may be bloodshot, and you will have a hard time being in bright sunlight. Upper eyelids may withdraw, making you look like you are staring. You may have double vision or other eyesight problems. Your neck will swell and you will feel sore, especially around where the swelling and bumps are. You could lose your hair, or it could start going prematurely or suddenly grey. Your heart rate will be faster as well, due to how sped up your metabolism is, and this could give you palpitations and shortness of breath. Over time, untreated hyperthyroidism could cause osteoporosis and muscle wastage, due to food being digested poorly.



Hyperthyroidism can happen for a variety of reasons, but there are some causes which are more common than others. Graves' disease is the most common cause of hyperthyroidism. This is an autoimmune condition where our body releases too many antibodies, stimulating our thyroid to produce too much thyroid hormone. Another common cause is over medication of thyroxine. This is where a hypothyroid patient has been prescribed thyroxine and for whatever reason taken an overly high dose, giving them too much thyroid hormone. Some people suffer from conditions which temporarily or permanently make their thyroid swell up, causing it to be sore, visible through the skin of the neck, and tender. They will also produce too much thyroid hormone. These conditions are usually minor illnesses, but could also be a goiter, adenoma, or cancer. And finally, a pituitary problem can also cause hyperthyroidism. As the pituitary gland makes the hormones that stimulate our thyroid, an overactive pituitary gland could result in an overactive thyroid.

Finally, please be aware that you can have clinically normal thyroid hormone levels and still experience hyperthyroidism. This is because our necessary levels of thyroid hormones are different from person to person, so you could still be producing the wrong amount even if you are not off the charts. It is unlikely your condition is serious if you are in this state,

but it is still important to discuss the possibility with your doctor and to get to the bottom of your symptoms, for your own sake.

What is hypothyroidism?

Hypothyroidism is when our body produces too little thyroid hormone. This can cause all manner of problems, largely based around our metabolism running too slowly, but with potential to affect our health from top to bottom, including physical growth, digestion, fertility, and mood.

The symptoms of hypothyroidism are varied, due to how much of your body is affected. The earliest symptoms are lack of energy, lethargy, sudden fatigue, and muscle pain. As time goes on, someone with hypothyroidism can experience serious weight gain, slowed movements, thought, and speech, and numbness throughout their body. They will find themselves dehydrated, with dry eyes, a sore throat, and a hoarse voice. Their muscle and joint pain may become more severe, resulting even in muscle wastage. And they may find they suffer from heart conditions such as palpitations, low blood pressure, blood pressure swings, and breathlessness. The list literally goes on and on, as our thyroid is so vital to proper functions throughout our body.

Hypothyroidism can also happen for a variety of reasons. One of the biggest causes is Hashimoto's disease. This is an autoimmune condition where the antibodies released may stimulate the thyroid briefly, but then attack it, damaging it and preventing it from releasing thyroid hormone. Again, the pituitary gland can fail or be underactive itself, making it so that not enough thyroid stimulating hormone is released, so our thyroid doesn't know when to produce more hormones. Environmental factors are an increasingly common cause of sudden hypothyroidism, with many chemicals being linked to an underactive thyroid. Medications for hyperthyroidism can be administered in doses so high that hypothyroidism can be caused, or you may be on a dose of thyroxine but unable to use it properly. Some people simply have a predisposition to thyroid failure, meaning they are born with an underactive thyroid, or that their thyroid will wear down and at some point in their life simply stop working properly. Finally, the receptors for thyroid stimulating hormone in your thyroid, or for T3 hormone around your body, may simply not be accepting the hormone, which is the equivalent to an important email ending up in your spam folder. No matter how much of a hormone is produced, if no cell will accept it then it is useless to us.

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How does our vitamin and mineral intake affect our thyroid?

Our thyroid hormone production, as has already been mentioned, relies on the right combination of basic nutrients and other hormones. And, again, it has been explained that environmental factors may cause thyroid conditions in vulnerable people. So how exactly, can our vitamin and mineral intake impact on our thyroid and cause it to produce too much or too little hormone?

Three nutrients are absolutely essential to producing enough thyroid hormone:

magnesium, vitamin B12, and zinc are all basic to producing enough thyroid hormone. This combination reaches our pituitary gland and is then used to create thyroid stimulating hormone. So, if you don't get enough of these nutrients, then you can't produce the hormone that will tell your thyroid to produce thyroid hormones.



Another nutrient we need to consider when looking after our thyroid is iodine. Iodine is a more directly important nutrient, because it is crucial to making T4. T4 is a thyroid hormone which has four molecules of iodine, and which can be stored and converted into T3 at a later date. In the past lack of iodine was such a serious condition that we started adding it to our salt. However, the best sources are actually seafoods, such as seaweed and shellfish, due to their rich mineral diversity.

But iodine doesn't work on its own. Your thyroid uses a combination of vitamin B2 and vitamin C to attract iodine into itself. These vitamins are used to essentially open a little hormonal pathway which the iodine travels on. A lack of these vitamins can cause hypothyroidism easily.

Finally, when it comes to converting T4 into useful T3, we need some more nutrients. T4 is more of the form in which we store and transport our thyroid hormone. Some researchers have suggested that it has its own purpose too, but no concrete evidence has been found yet, so for now we must assume that its main job is to turn itself into T3. And it can't become T3 without selenium, which is used to make the enzyme that converts T4 to T3. Our body will try and make it, but instead create reverse T3, which does not actually work. This will mean your thyroid hormone levels will look normal, but you will still suffer the symptoms.

Furthermore, for *any* of these hormones to work the cells in our body need to be active and ready for the hormones. Almost every cell in our body has a receptor layer around its

nucleus. When the right hormone passes by, this receptor draws the hormone in and uses it. But these receptors are weak, sometimes even do not work, without vitamin A and vitamin D3. Vitamin A is an important antioxidant which keeps cells scrubbed clean and active, whereas vitamin D3 acts as an information carrier, a sort of hormone itself, telling cells and hormones where to find each other. A deficiency in either vitamin could cause hormonal disruptions of all kinds.

Finally, your basic protein intake can massively influence thyroid function. Both thyroid stimulating hormone and thyroid hormone itself use a lot of protein in their production, so you need to make sure you have a surplus of protein to draw from.



All this is why vegans and vegetarians in particular need to beware thyroid conditions. Due to how the nutrients we have, or in this case do not have, can cause thyroid problems, it is vital to make sure we get enough of these nutrients. And many diets which exclude animal produce have a low content of protein, vitamin B12, magnesium, zinc, vitamin B2, iodine, and vitamin D2, which is our edible precursor to vitamin D3. Likewise, people with a very simple, processed diet are probably deficient in iodine, vitamin D2 or D3, magnesium, and vitamin C. You need to make sure you eat the widest possible range of foods, to ensure you get enough of everything you need to keep your thyroid strong.

How does hyperthyroidism affect our vitamin and mineral needs?

Not only do certain vitamin and mineral deficiencies cause hyperthyroidism, but hyperthyroidism itself can cause deficiencies too. This means that if you have lived with this condition for a while, your body may have been depleted of some nutrients. What is more, your need for other nutrients will go up if you suffer hyperthyroidism, as your condition places a lot of stress on the body, making big doses of some nutrients very medicinal.

Vitamin B1 is absolutely vital for people with hyperthyroidism. This vitamin suppresses thyroid function and encourages us to become more sensitive to thyroid hormone, making large amounts less necessary. On the flip side, you will not need extra vitamin B2, as this vitamin stimulates the thyroid.

Due to muscle weakness, shivers, muscle wastage, and bone wastage, all of which are common in hyperthyroidism, it is essential to get enough vitamin B6, vitamin C, and vitamin D, because these are all used up in a desperate effort to repair the muscles and bones which are being torn apart by an overactive metabolism.

How does hypothyroidism affect our vitamin and mineral needs?

As with hyperthyroidism, hypothyroidism can cause as many deficiencies as caused it in the first place. You may find that your body is seriously depleted of some nutrients, or that other nutrients make for highly effective medicines.

If your thyroid is underactive, you may not be converting beta carotene to retinol very well. This is significant, as it means that you may have gone your whole life getting enough vitamin A from plant-based beta carotene, only to become deficient and need retinol instead due to your thyroid condition.

Vitamin B2 is known to promote thyroid activity, so even though it is not a good idea if you have a hyperthyroid condition, it is amazing for people with hypothyroidism. On the flip side, vitamin B1, which encourages a reduction in thyroid activity, is not a good supplement for you.

What supplements are best for someone with a thyroid condition?

You need to avoid carotene in your supplements because, even though it turns into vitamin A for most people, an underactive thyroid means you can't do this conversion. For this reason, it is best to supplement with animal products which contain retinol, the ready-to-use form of vitamin A, or to get a retinol supplement. 1000-1500 IUs of vitamin A will be needed for optimal health.

A B vitamin complex may be the best idea for someone seeking to prevent a thyroid condition, but if you already have thyroid troubles, then refer to the lists above to see which B vitamins you will most need, and buy them separately. The amount you need will depend on you and your personal condition.

If you suffer from hypothyroidism you will need a vitamin B12 injection. This is because it is thyroid activity which encourages absorption, recycling, and synthesis of vitamin B12. It is actually a deficiency in this vitamin which is the leading cause of mental health and mood complaints in patients with hypothyroidism.

When we have a thyroid problem our body will burn through vitamin E much too quickly to be replaced naturally. Therefore, a high dose of vitamin E may be needed. Talk to your doctor about supplementing vitamin E as part of your medical routine. 200-800 IUs of vitamin E are a typical dose for thyroid patients.

If you have an overactive thyroid and you are not eating much dairy or dairy substitute, you may need a high quality calcium supplement to prevent osteoporosis. Make sure to take

this with magnesium and vitamin D3, to ensure that you make the most of it. How much you need depends on your condition.

Not only does zinc deficiency lead to thyroid conditions, but both hypothyroidism and hyperthyroidism can *cause* a zinc deficiency too. This can affect your body fat distribution, your immune system, and make your thyroid problem worse. Consider supplementing 15-20 milligrams of zinc daily.

