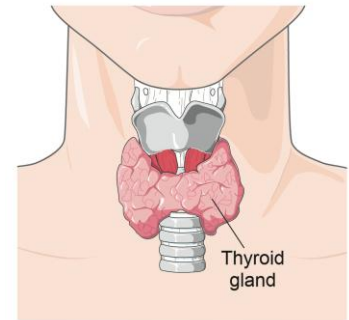


Integrative Treatment of Hypothyroidism

What is the thyroid gland?

The thyroid gland is an organ that sits at the base of the neck. It is involved in an astonishing number of bodily processes. The gland makes two hormones: T3 (triiodothyronine) and T4 (thyroxine). These hormones affect every cell in the body. They regulate the chemical actions needed to live. They play a role in reproduction and proper growth and development. They maintain body temperature, and affect the activity of the heart. They also affect brain function.



What is hypothyroidism?

Thyroid disorders range from an underactive gland that does not make enough hormone to an overactive gland that makes too much hormone.

- **Hypothyroidism** is the condition diagnosed when the thyroid is underactive.
- **Hyperthyroidism** is diagnosed when the thyroid is overactive.

Hypothyroidism is the most common thyroid disease. It is estimated that between 0.1 and 2% of people will receive this diagnosis. Women are 10 times more likely to develop it than men. The elderly and pregnant women also have higher rates of hypothyroidism.

What are the symptoms of hypothyroidism?

Because the thyroid gland affects so many different parts of the body, there can be many different symptoms when it is not working as it should. These symptoms are not unique to thyroid problems. The same symptoms can be due to other causes.

SIGNS AND SYMPTOMS OF HYPOTHYROIDISM	
Fatigue	Constipation
Weight gain from fluid retention	Memory problems
Dry skin and cold intolerance	Decreased concentration
Yellow skin	Depression
Coarse hair or loss of hair	Irregular or heavy menstrual periods and infertility
Hoarseness	Muscle pain or tenderness
Goiter (enlarged thyroid gland)	High level of fats in the blood
Slowed bodily reactions	Slow heart rate and low body temperature
Lack of coordination	Excess fluid in body tissues

What causes hypothyroidism?

The most common cause of hypothyroidism worldwide is a lack of iodine. In the United States and other developed parts of the world, autoimmune hypothyroidism (Hashimoto's disease) is the most common thyroid disease. In Hashimoto's disease, a person's immune system attacks the thyroid gland, causing cells to change and the gland to become underactive. In the U.S. many people



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who have hyperthyroidism will eventually be diagnosed with the opposite condition—hypothyroidism. This is because an overactive thyroid gland can “burnout” or because medical treatment for hyperthyroidism eventually results in the opposite condition.

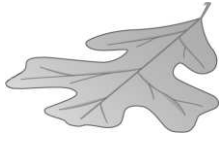
CAUSES OF HYPOTHYROIDISM	
Too little or too much iodine in the diet	Inflammation of the thyroid gland following childbirth
Chronic autoimmune thyroiditis (Hashimoto's thyroiditis)	A birth defect resulting in the thyroid gland being absent or abnormal
Thyroid surgery	Radiation to the neck
Drugs used now or in the past <ul style="list-style-type: none">● Amiodarone (used to control problems with heart rhythm)● The dye containing iodine that is used in x-ray procedures● Lithium (used to treat bipolar disorder)	Diseases that affect one or more organs such as <ul style="list-style-type: none">● Tuberculosis (a contagious disease affecting the lungs)● Sarcoidosis (a disease involving many organs which causes the growth of lumps resembling little tumors)
	A problem in the pituitary gland, where TSH is made
Severe illness such as infection or trauma	A problem in the hypothalamus, the part of the brain that controls many body processes

How is hypothyroidism diagnosed?

A clinician will diagnose hypothyroidism based on:

- your symptoms
- a physical examination
- your medical history (e.g., medications, previous thyroid surgery or radiation to your neck)
- your family history (e.g., if a family member has had thyroid disease)
- and one or more blood tests
 - Thyroid Stimulating Hormone (TSH) test. This test measures the amount of TSH in your blood. TSH is made by the pituitary gland. (The pituitary gland is located at the base of the brain and makes a number of different hormones). TSH determines how much T3 and T4 hormones the thyroid should make. A high level of TSH means the thyroid gland is not making enough T3 and T4 hormones.
 - T4 and T3 test. For some causes of hypothyroidism, a TSH test alone will not be enough to detect disease. T4 and T3 tests measure the amount of these hormones in your blood.

There has been some debate in recent years over the diagnosis of hypothyroidism. Some patients seem to have symptoms even though their TSH and T4 tests are in the normal range. To address this issue, the normal ranges for TSH have been changed in the past decade. Also a new category of disease called *subclinical hypothyroidism* has been created. This diagnosis is made when a patient has normal blood tests yet seems to have a thyroid gland that is not functioning correctly. Integrative medicine clinicians will look at each patient as an individual. They will base their treatment recommendations on the symptoms you report as well as the results of your thyroid tests.



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How is hypothyroidism treated?

The first step in treatment is to eliminate or relieve known or suspected causes of the disease. Your clinician will be considering your medications, diet, and other possible illnesses. Usually treatment can begin before the exact cause is known. Typically the goal is to have lab tests and measurements such as your body temperature return to normal. The normal range for TSH is 0.4-4.0 micro units/ml. Your symptoms may best improve if your TSH is in the range of 0.5-3.0 micro units/ml with treatment. Successfully treating this disease involves improving other symptoms as well. If you are being treated for hypothyroidism, talk to your clinician about any symptoms you think may be related, even if your TSH and T4 tests are in the normal range. Adjusting your treatment may help you feel better. If left untreated over time, hypothyroidism can lead to serious health problems and become life-threatening.

An integrative approach to treatment includes: 1) nutrition and supplements, 2) botanicals, 3) prescription drugs, and perhaps 4) some other complementary approaches.

1. Nutrition and Supplements

- **Iodine.** Iodine is a mineral that the thyroid gland needs in order to work properly and make T3 and T4 hormones.

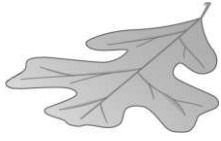
A lack of iodine is a major cause of hypothyroidism worldwide. This usually occurs in countries that are poor and land-locked, where people get less than 50 mcg of iodine per day in their diets. Programs that add iodine to salt have corrected the problem in many parts of the world. It is rare for people in the U.S. or other developed nations to be getting too little iodine.

The main way a person gets iodine is by eating iodized salt, saltwater fish and sea vegetables. The Recommended Dietary Allowance (RDA) of iodine is 150 mcg per day for adults. You get this amount by eating one half teaspoon of iodized salt. The average American eats more than twice this amount each day. However, if you are on a diet that strictly reduces salt, you may not be getting enough iodine. A healthy way to get more iodine is to eat sea vegetables. You can find sea vegetables at grocery stores that carry health food or have an Asian food section as well as at Japanese restaurants.



The most iodine an adult should get is 1,100 mcg per day. You can get too much iodine if you eat large amounts of seafood, iodine supplements, or sea vegetables (see section on *Botanicals* on pages 4-5.) Ironically, getting too much iodine can also cause hypothyroidism. This is temporary and clears up when a person is no longer getting such high doses of iodine.

Blood and urine tests are sometimes helpful in identifying whether someone is getting enough iodine. It is not clear if these tests tell the whole story. It is possible that they are not always reliable.



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- **Selenium.** Selenium is another mineral the body needs in order for the thyroid gland to work properly. Selenium helps change T4 into a form your body can use. Getting more selenium, if you are lacking it, may improve how your thyroid gland works.

A lack of selenium is uncommon. People with severe intestinal diseases (such as severe Crohn's disease) are at risk for developing a low selenium level. A low level of selenium in the body may not cause symptoms but may lead to other diseases, such as hypothyroidism or heart problems.

It is unclear to what extent selenium supplements will help if you are already getting enough selenium. Selenium supplements might be helpful for people whose hypothyroidism is caused by autoimmune thyroiditis (Hashimoto's Disease). It has also been found to improve well-being and mood for people with this cause of the disease.

Be careful in taking selenium supplements if you are also low in iodine. Selenium can cause your thyroid function to be worse if you are not getting enough iodine in your diet. You can take supplements of both selenium and iodine at the same time if you are lacking both. Work with your clinician to do this safely. Selenium can be harmful. The RDA for selenium is 55 mcg per day. The most an adult should take is 400 mcg per day. One relatively safe way to get this amount is by eating 3-4 Brazil nuts each day.

- **Other nutrients: Vitamin A, Iron and Zinc.** Many other vitamins and nutrients help determine how the thyroid gland works. Vitamin A, iron and zinc are three of the most important. Work with your clinician to determine if you are getting enough of them in your diet. If not, you might try taking supplements. Recommended daily doses for low thyroid function for adults are as follows:
 - **Zinc** 10-40 mg/day.
 - **Iron** 325 mg of ferrous sulfate or ferrous gluconate
 - **Vitamin A** 800-3,000 mcg/day.
- **L-Tyrosine.** Thyroxin (T4) is one of the hormones the thyroid gland makes. T4 is made from tyrosine, which is a non-essential amino acid, a building block of protein. L-tyrosine supplements are commonly used to support the thyroid gland. L-tyrosine has been shown to improve alertness and ability to function in people who did not get enough sleep. This means that it could possibly help improve the symptoms of hypothyroidism, although this is not known for sure. Regardless, L-tyrosine is generally safe. If you have been diagnosed with hypothyroidism, you may want to consider taking this supplement. The typical daily dose is 500 mg 2-3 times daily before meals. It is a good idea to work with your clinician to make certain you take the correct dose.

2. Botanicals and Sea Vegetables

- **Sea Vegetables.** Sea vegetables or seaweeds contain different amounts of iodine depending on the species, where they grew, and how they are prepared. Consider including them in your diet if you or your clinician suspect that you are getting too little iodine. Do not eat them as much or at all if it appears that you are getting too much iodine.



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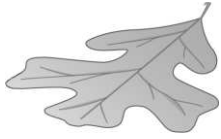
COMPARISON OF SEA VEGETABLES TO OTHER SOURCES OF IODINE ^{18,19}		
Food	Minimum Amount Needed to Meet Daily Intake Requirement*	Maximum Amount for Daily Intake Requirement*
Sea vegetables		
Kelp	9 mg = 0.0003 oz/day	70 mg = 0.0025 oz/day
Nori	9 g = 0.3 oz/day	69 g = 2.4 oz/day
Dulse	2 g = 0.07 oz/day	15 g = 0.5 oz/day
Other foods		
Iodized Salt	2 g or ~1/3 tsp/day	14g or ~2.5 tsp/day
Cod	4.5 oz/day (~1.5 servings)	33 oz/day
Cow's Milk	3 cups/day	20 cups/day
Potato (with peel)	2.5 medium size	18 medium size

*These amounts are estimates. Actual content of foods vary considerably based upon growing conditions, storage and preparation.

- **Guggulu (*Commiphora wightii*).** Guggulu (also known as or guggal, or guggul lipid) is a sticky substance that is found in a small tree used in Ayurvedic medicine. (Ayurvedic medicine is an ancient system of medicine from India.) The high fiber content of guggulu is used as a possible way to lower cholesterol. A part of guggulu called guggulsterone has been found to have good effects on the thyroid, but further research is needed.
- **Plant foods.** There are many foods that may contribute to the thyroid not working well. Unfortunately, many of these are otherwise very healthy foods. They include the brassica genus of vegetables (e.g., broccoli, cabbage, cauliflower, turnip), soy, cassava (the root is eaten, and it is used to make tapioca) and millet (a grain). These negative effects only seem to occur for people who are low on iodine. So, probably the best way to avoid any negative effects of these generally healthy foods is to eat enough foods containing iodine. Cooking these foods may help to prevent negative effects on the thyroid as well.

3. Prescription medications

Can I avoid taking prescription medications? Clinicians prescribe medication for most patients with hypothyroidism. Patients often ask if there is a way to avoid taking a prescription drug. This may be possible if you are diagnosed with *subclinical hypothyroidism*. This is when the TSH is slightly higher than normal, but the T3 and T4 are in the normal range. *Subclinical hypothyroidism* could possibly be reversible. Once you start taking thyroid medication, however, you will probably have to take it forever. You would not know if the condition could have been reversed. Talk with your clinician if you are diagnosed with *subclinical hypothyroidism* and want to try a non-drug approach first. You will find a list of suggested supplements and vitamins for this purpose on the next page. Your clinician should work closely with you to monitor the success of this approach.



**A SUGGESTED NON-DRUG APPROACH TO TRY IF YOU ARE DIAGNOSED WITH
SUBCLINICAL HYPOTHYROIDISM**

Take all of the following by mouth each day.

- Iodine: 150-600 mcg (if your diet puts you at risk for too low a level) or cut back on foods containing iodine if you may be getting too much
- Selenium: 50-300 mcg (about 2 brazil nuts daily)
- Zinc: 10-40 mg
- Ferrous sulfate: 325 mg (*65 mg of elemental iron*)
- Vitamin A: 800-3,000 mcg
- L-Tyrosine: 500 mg 3 times daily before meals

(Generally, a diet that consists of seafood, a handful of nuts, dark greens and multi-colored whole foods will include the majority of these nutrients)

Keep a list of the symptoms you experience. Also see your clinician to have another TSH thyroid test in six weeks. If your symptoms and the test results remain the same, stop the supplements. Your clinician will advise you regarding further treatment.

Prescription medications for hypothyroidism include: synthetic (man-made) T4, synthetic T3, and ground pig thyroid.

- **Synthetic T4 (Levothyroxine).** Synthetic T4, with the drug name levothyroxine, is the treatment usually prescribed for hypothyroidism. A clinician starts a patient on a dose from 12.5 to 50 mcg per day. A TSH blood test done every 6-8 weeks will help to determine if the dose should be adjusted. Young healthy individuals might start at a dose of about 1.6 mcg per kilogram of body weight per day. The highest dose prescribed is about 300 mcg per day.
- **Synthetic T3 (Liothyronine).** Synthetic T3, with the drug name liothyronine, is occasionally used along with synthetic T4 to treat hypothyroidism. It is harder to find the right dose compared to synthetic T4.

However, each person is different. Synthetic T4 alone may not be adequate to treat all people with hypothyroidism effectively. A number of studies have been done to investigate if giving synthetic T3 and T4 together would be better than giving synthetic T4 alone. The studies had different results. Analyzing the results of several studies together involving 1,216 patients showed that treatment with both synthetic T3 and T4 was no better than synthetic T4 alone. A later study found that patients who had treatment with both synthetic T3 and T4 reported better quality of life and well-being than those who took synthetic T4 alone.

One possible approach is for clinicians to prescribe a combination of synthetic T3 and T4 for patients whose blood tests do not return to normal after treatment with synthetic T4 alone. This could be tried especially for patients whose T3 levels continue to remain at low



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or low normal. If this is your situation, your doctor might prescribe a dose of one part T3 with four parts T4.

- **Porcine (pig) thyroid.** Ground pig thyroid is an older form of thyroid hormone that is still used by many patients. Some brand names are Armour Thyroid, NP Thyroid and Nature-Thyroid. Drugs made from pig thyroid contain a combination of about 80% T4 and 20% T3, which is like the natural hormones our human thyroid gland makes. Many patients consider this to be more natural, and they report better results with this form of medication. The clinician monitors treatment in the same way as synthetic T4. A review of symptoms and a TSH blood test done every 6-8 weeks will help to determine if the dose should be adjusted. 1 grain (60 mg) of ground pig thyroid = 100 mcg of synthetic T4. The starting dose is 0.5 grains in young healthy adults.

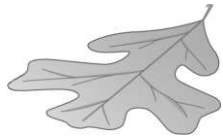
What is the best way to take thyroid medication? Paying attention to the time of day and taking thyroid medication on an empty stomach may help it work better.

- **Time of day.** In the past, patients were instructed to take thyroid medications in the morning on an empty stomach. The reasoning was that this would help prevent interference with food or other medications. However a recent study showed good blood test results when synthetic T4 was taken at bedtime. Based on this evidence, it is reasonable to take your thyroid medication before bed. Taking it in the morning is also fine, especially if this helps you remember to take it.
- **Empty stomach.** Many medications, supplements and foods can interfere with how your body absorbs thyroid medication. For this reason, it is best to take thyroid medication on an empty stomach. Common medications and supplements that interfere with your thyroid medication include: proton pump inhibitors, antacids, anticonvulsants, calcium and iron.

4. Other Complementary Approaches to Consider

If you like to use complementary approaches, there are two you might consider for thyroid health. Both are generally safe. However, at this time, there is no strong proof that they will be helpful.

- **Yoga.** There is a particular yoga *asana* (posture) that is considered to be helpful to the thyroid gland. This is *Sharvangasana*--the shoulder stand. This claim has not been well researched. This yoga posture is generally safe under the guidance of a qualified teacher.
- **Hydrotherapy.** Hydrotherapy is a general term for approaches that involve sitting or lying in water to promote healing. Hydrotherapy has been used from ancient times to the spas we see today. Most often, different temperatures of water are used. It is possible that sitting in different temperatures of water could exercise and strengthen the system of the body that controls body temperature. The thyroid gland plays a major role in controlling body temperature. Therefore, hydrotherapy might exercise and strengthen the thyroid gland. Further research is needed.



Integrative Treatment of Hypothyroidism

The information in this handout is for general education. It is not meant to be used by a patient alone. Please work with your health care practitioner to use this information in the best way possible to promote your health.

This handout was created by Charlene Luchterhand, MSSW, Integrative Medicine Program, Department of Family Medicine, University of Wisconsin-Madison School of Medicine and Public Health. It was adapted from a version written for clinicians by Surya Pierce MD, Integrative Family Physician, Li Si Wi Nwi Clinic, Absentee Shawnee Tribal Health Programs, Norman, OK.

References, if needed, can be found in the clinician version of this handout.

Date Created: October 2011

Notes: