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Graedons' Guide to

Thyroid Hormones

Symptoms of Low Thyroid Activity

- Apathy
- Fatigue
- Dry skin
- Weakness
- Constipation
- Hair loss
- Cold intolerance
- Puffy eyes
- Decreased sweating
- Infertility
- Heavy menstruation
- Lower libido
- Swollen hands or legs
- Brittle fingernails
- Slow pulse
- Anemia
- Elevated cholesterol
- Shortness of breath during exercise
- Hoarse voice
- Clumsiness
- Depression
- Mental slowness
- Carpal tunnel syndrome

The thyroid gland has surprising power for such an unobtrusive organ. It controls how fast every cell in the body uses energy. It also affects cells' response to growth hormone and other compounds, including estrogen and calcium. Because of its widespread impact, though, symptoms of thyroid problems may be vague and general, making diagnosis difficult.

Underactive Thyroid

If the gland is producing too little thyroid hormone (thyroxine), a person may become easily chilled, sometimes running lower-than-normal temperatures on a thermometer. Fatigue and constipation are common complaints in this condition. Weight gain may result from inadequate thyroxine, particularly due to increased fluid retention. Thyroid deficiency can sap muscle strength and lead to shortness of breath during exertion.

Thick, dry skin, brittle fingernails and coarse sparse hair are not unusual. When the outer third of the eyebrows is missing, it strongly suggests low thyroid function. Hair may also fall out on other parts of the

body such as the legs, underarms and pubic region in addition to the scalp.

The doctor will also check for a slow Achilles reflex, look for a swollen area around the eyes, and ask about a woman's menstrual cycle. Heavy bleeding may be associated with inadequate thyroid hormone, and women without enough thyroid may have trouble getting pregnant. Depression and difficulty concentrating are sometimes the main symptoms. For a diagnosis, the physician will need to check thyroid hormone levels with a blood test.

To treat hypothyroidism (too little thyroid activity), doctors prescribe synthetic hormone in pills such as **Synthroid**, **Levoxyl** or **Levothroid** to supplement or replace the patient's inadequate supply. They used to believe there were no side effects to thyroid therapy if the dose was appropriate. But now scientists suspect that thyroxine may increase the risk of osteoporosis, especially at higher than normal doses. This could be especially serious for older women, who are at the greatest risk of bone loss.

CAN THYROID HORMONE WEAKEN BONES?

Thyroid hormone has a profound effect on bone metabolism. People whose thyroid glands are overactive (hyperthyroidism) are at high risk of osteoporosis. Doctors have learned that when they give too much thyroid hormone to treat underactive glands, their patients also end up with weakened bones.

Preliminary research has suggested that even normal doses of thyroid replacement hormone may lead to reduced bone density. This finding is unexpected and disquieting, but another report indicates that if thyroid therapy results in TSH values within the normal range, bone loss is minimized. Most recently, a study of older women found that long-term treatment with 200 micrograms or more of thyroid hormone was associated with lower bone mineral density. Postmenopausal estrogen therapy offset this bone loss.

Under these circumstances, it makes sense to take care with the dose of thyroid hormone. This requires close communication and periodic testing. Age and other medications may affect the body's requirements for thyroid hormone. Bone density measurements may be called for, and if signs of osteoporosis begin to appear, preventive treatment may become prudent.

References: Kung, A.W.C., & Pun, K. K. Bone Mineral Density in Premenopausal Women Receiving Long-term Physiological Doses of Levothyroxine. *JAMA* 1991;265:2688-2691. Greenspan, S. L., et al. Skeletal integrity in premenopausal and postmenopausal women receiving long-term l-thyroxine therapy. *Am. J. Med.* 1991; 91:5-14. Schneider, D.L. et al. Thyroid Hormone Use and Bone Mineral Density in Elderly Women: Effects of Estrogen. *JAMA* 1994; 271:1245-1249.

SOME MEDICINES THAT AFFECT THYROID TESTS

<i>Drug</i>	<i>Test</i>	<i>Effect</i>
Amiodarone Cordarone	Total T ₄ , serum T ₃ , reverse T ₃ TSH	Raises T ₄ , lowers T ₃ levels and increases rT ₃ and TSH. Abnormal tests may persist weeks or months after drug is discontinued. Drug may trigger thyroid function problems in some patients.
Anabolic steroids Testosterone, etc.	Total T ₄ , serum T ₃ , TSH	Lowers test values; levothyroxine dose may need reduction
Aspirin (large doses)	Total T ₄	Lowers reading without affecting thyroid function
Carbamazepine Tegretol	Total T ₄ , T ₃ resin uptake, others	Lowers test values. In combination with other anticonvulsants, may affect thyroid
Corticosteroids Celestone Cortef Cortisone, etc.	Total T ₄ , serum T ₃ , TSH	Lowers test values
Estrogen Estrace Estraderm Premarin , etc.	Total T ₄	Raises reading without necessarily affecting thyroid function
Haloperidol	TSH	TSH scores tend to increase
Heparin	TSH	TSH values may be low
Iodine-containing contrast media	All	Thyroid function tests may be altered up to a few years after the x-ray or myelogram.
Lithium Eskalith Lithane Lithobid , etc.	All	Readings may be altered indicating reduced thyroid function. In some cases, thyroid function is suppressed.
Metoclopramide Reglan	TSH	TSH tends to be higher
Oral Contraceptives Demulen 1/50 Norlestrin Ovral , etc.	Total T ₄	Raises reading without necessarily affecting thyroid function
Parkinson's disease drugs Parlodel Sinemet Symmetrel	TSH	Test value lowered
Phenytoin (high dose) Dilantin	Total T ₄	Lowers reading without affecting thyroid function
Perphenazine Trilafon (long-term)	Total T ₄	Raises reading without affecting thyroid function
Propranolol (large doses >160 mg)	T ₃ , serum T ₄	Serum T ₃ decreases, serum T ₄ may increase without change in thyroid function
Salsalate Disalacid	Total T ₄ , serum T ₃ , etc.	Test readings are significantly lower; thyroid function is not altered
Tamoxifen Nolvadex	Total T ₄	Raises reading without affecting thyroid function

NORMAL VALUES OF THYROID BLOOD TESTS

Serum TSH by immunoradiometric assay (IRMA)	0.4-5 mcU/ml
Total Serum T ₄	5-12 mcg/dL
Serum T ₃	80-180 ng/dL
T ₃ Resin Uptake	25-35 percent
Thyroxine-binding globulin capacity	15-25 mcg T ₄ /dL

Normal values may vary from lab to lab.

Thyroid Testing

Because the symptoms are non-specific, diagnosis of thyroid disorders requires a careful history and sophisticated blood test. The best test is one called an immunoradiometric assay (IRMA). It measures the level of a brain hormone called "thyroid stimulating hormone," or TSH for short. Sometimes it may be termed "thyrotropin."

TSH controls the action of the thyroid gland the way a thermostat controls the activity of a furnace: when the gland is making too little thyroid hormone, the brain puts out more TSH to tell it to make more. If there is too much thyroid hormone in the bloodstream, the brain's output of TSH will drop, sometimes almost to nothing. As a result, the TSH level is a very good, upside-down indicator of thyroid function: when you have too little thyroid hormone, TSH is high; if you have too much, TSH will be very low. A third-generation sensitive TSH is most accurate. Some experts recommend, however, that total thyroxine be considered as well, to detect pituitary abnormalities.*

Should you be treated if your doctor discovers an abnormal TSH level but you have no other symptoms? This is controversial. People with subclinical hypothyroidism may become symptomatic, but they may also do well for years without treatment. Some experts believe treatment to normalize TSH protects other body systems from the effects of hypothyroidism.

If the TSH is within the normal range, but the person has symptoms suggesting

that the thyroid gland is underactive, the doctor may order a TRH. This test utilizing thyrotropin-releasing hormone is a way of stimulating the pituitary gland to determine how it responds; a large response to TRH suggests an underactive thyroid gland.

Many drugs can affect thyroid function tests. Make sure your doctor is aware of all the medicines you are taking. This is especially important in the case of the radioimmunoassay (RIA) for serum total T₄ and the test for T₃ resin uptake. Although these older blood tests may still be done as part of a thyroid panel, medications such as estrogen or **Dilantin** may alter their values and give misleading results. See the table on page 2.

Pregnancy

Just as estrogens in birth control pills or postmenopausal hormone regimens alter thyroid function tests, so does pregnancy. This can make an accurate assessment of thyroid function more difficult. Determination of free T₄ may also be needed to correct for the increase in blood protein that binds to thyroxine. TSH should not be affected in women with normal thyroid function, but many who were being treated for thyroid problems before conceiving may need higher doses of thyroxine during pregnancy. TSH should be measured each trimester so that appropriate thyroxine replacement can be determined. Untreated hypothyroidism increases the risks for mother and baby.

Conditions that May Require Change in Dose

Aging
Malabsorption
Pregnancy
Thyroid surgery
Treatment with other drugs:
Carafate
Cordarone
Dilantin
Estrogen**
Iron
Questran
Rifampin
Tegretol
Testosterone

* Wardle, Fraser & Squire. "Pitfalls in the use of thyrotropin concentration as a first-line thyroid-function test." *The Lancet* 2001; **357**:1013-1014.

Arafah. "Increased need for thyroxine in women with hypothyroidism during estrogen therapy." *N. Engl. J. Med.* 2001; **344: 1743-1749.

"I had problems on Synthroid and switched to Armour. I am now in excellent health with lots of energy, a cheerful disposition and greatly improved mental acuity and memory. I also found it easy to lose 7 pounds, which I could not do on Synthroid.

"Armour thyroid has both T₃ and T₄, whereas Synthroid provides only one of these and the body is supposed to manufacture the other. Is it possible some of us can't make the other, so Synthroid doesn't work for us? I am living, bouncing proof that a switch to a natural thyroid can work."

"For years I took Thyrolar for hypothyroidism. When I had to change doctors, my new endocrinologist refused to prescribe it. He said the dose is too hard to adjust and test results difficult to interpret. Instead he prescribed Synthroid.

"In the three years since then, I have gained 25 pounds and am tired all the time. I have complained and had numerous blood tests, but each time the results are within normal range. A nutrition expert said I should be taking Armour Thyroid because Synthroid robs the bones of calcium.

"When I asked the doctor about this, he said Synthroid is best because the dosages are exact and testing is more precise. Those nice normal test results make my doctor feel good but I still feel lousy."

*Bunevicius, Kazanavicius, Zalinkevicius and Prange. "Effects of Thyroxine as Compared with Thyroxine Plus Triiodothyronine in Patients with Hypothyroidism." *N. Engl. J. Med.* 1999; **340**: 424-429.

Natural or Synthetic?

Underactive thyroid glands, or "hypothyroid" conditions, are treated by supplying extra thyroid hormone. These hormones come in a wide variety of formulations. Natural products include the ground-up dried thyroid glands of cows or pigs. This "desiccated" thyroid used to be the only source of replacement hormone. It is still available as **Armour** thyroid, but endocrinologists sometimes worry about potency changing from one batch to the next. Consequently, many doctors prefer to prescribe a synthetic, usually levothyroxine, or T₄. It is available generically or as **Synthroid**, **Levothyroid**, **Levoxyl** or **Unithroid**.

Levothyroxine comes in a wide range of doses. The doctor generally tries to adjust the dose so that each patient is taking the smallest amount that brings the TSH level into the normal range. Generally, hormone specialists recommend starting at a very low dose and gradually increasing to the desired level. This requires patience and persistence as well as good communication with the doctor and periodic monitoring. Some people may need dose reductions as they age, especially if they develop heart problems.

Levothyroxine is absorbed best if it is taken on an empty stomach, so doctors often recommend it be taken at least a half-hour before breakfast. It is particularly important not to swallow this thyroid hormone at the same time or within an hour of calcium or iron supplements. These minerals can prevent absorption of the hormone. The most important thing is to be consistent in the way you take it, so that once the proper dose has been determined, that is the dose you actually get. Many experts feel it's best to stick with the same brand rather than switching back and forth, because there may be some differences in formulation that alter absorption.

Balancing T₃ and T₄

When a thyroid gland is functioning normally, it puts out two different hormones: triiodothyronine, or T₃, and levothyroxine, known as T₄. (The numbers indicate how many atoms of iodine are part of the hormone molecule.) Why, then, do physicians prescribe only one, levothyroxine? Even in a healthy person, the thyroid gland produces only a fraction of the T₃ that the body uses. Other tissues in the body normally convert T₄ to the more active T₃ as they need it, just by knocking one of the iodine atoms off. This works well for most people.

But there are individuals for whom levothyroxine just doesn't seem to do all it should. These people continue to experience symptoms even on doses of levothyroxine that should be adequate. Such patients may complain that their previous experience with Armour thyroid was far better and wonder why the physician does not simply prescribe desiccated thyroid. Because Armour thyroid contains both T₃ and T₄, some endocrinologists, such as Dr. Ridha Arem, are prescribing it in conjunction with levothyroxine for patients who may not be converting T₄ efficiently and who continue to experience symptoms. Dr. Arem cautions that a single dose of Armour during the day may result in an initial surge of T₃ and then a drop in the level of this hormone later in the day. It does not last long.

Other experts have found that adding a small amount of T₃ to patients' levothyroxine can alleviate depression and mental cloudiness from low thyroid hormone better than T₄ alone. It is possible that some of these people are not capable of converting T₄ to T₃ efficiently. In one study, researchers found the dose of levothyroxine that normalized TSH. Then, they replaced 50 mcg of that dose with 12.5 mcg of T₃, sold in this country under the brand name **Cytomel**.*

Dr. Arem writes that his experience with a T_4/T_3 combined regimen has been favorable, especially for patients who also have depression or fibromyalgia. He advocates dividing a small dose of T_3 even further, so that it can be taken two or three times a day.

Not all patients require T_3 in addition to standard levothyroxine (T_4). And for some endocrinologists, the idea of using Armour thyroid, alone or in combination with levothyroxine, smacks of quackery, or at best fringe medical practice. But perhaps more doctors will begin to experiment in collaboration with patients who continue to suffer symptoms of low thyroid despite TSH readings in the normal range. Too often such people are told, in essence, that their troubles are all in their heads. It is very likely that psychological factors do contribute to problems such as lethargy in some instances. Both doctors and patients should keep in mind, however, that a thyroid imbalance can sometimes trigger such psychological problems as depression, feelings of low self-worth, or anxiety.

Side Effects

There shouldn't be any obvious side effects of thyroxine when the dose is properly adjusted. In someone with heart problems, the dosage should be increased very gradually. If levels are too high, adverse reactions such as heart palpitations and rapid heart beat, insomnia, nervousness, and higher blood pressure may result. Other possible signs of overdose include headache, diarrhea, tremor, increased sweating, changes in appetite, weight loss and reduced menstrual flow. Report such symptoms to your physician promptly, as continued overdosage may cause serious cardiac or nervous system complications. If you continue to have symptoms of low thyroid activity, tell your doctor.

Treating Overactive Thyroid Glands

An overactive thyroid gland that produces too much hormone can be just as bad for health as one that doesn't produce enough. Hyperthyroidism, or thyrotoxicosis, may produce psychological symptoms, especially insomnia, nervousness or anxiety, in addition to physical symptoms like excessive sweating, rapid heart beat, inability to stand heat, frequent bowel movements, increased systolic blood pressure or wide pulse pressure, missing or scanty menstrual periods, and finger tremor. The TSH level in a case of thyrotoxicosis will be very low. Even the very sensitive IRMA test for TSH may not be able to detect it.

The most common form of hyperthyroid condition is Graves' disease. This is an immune system malfunction in which the body produces antibodies that attack the parts of the thyroid gland that usually detect and attach to TSH. This gives the gland a false signal that more thyroxine is needed and it keeps on producing more, in a "sorcerer's apprentice" scenario. In other cases, hyperthyroid conditions may result from growths on the thyroid (thyroid nodules). Diagnostic procedures like ultrasound, CT scan or magnetic resonance imaging (MRI) may be needed if nodules are suspected. Because excess thyroid can lead to bone loss, patients who have been diagnosed as hyperthyroid should also be followed up with bone density measurements.

The person with Grave's disease should also see an ophthalmologist for regular eye examinations, because as many as half of those with Graves' disease develop inflammation in the muscles and other tissues surrounding the eyes. Symptoms such as redness, soreness, blurred vision, bulging eyes and aversion to light may all be related to this autoimmune condition.

Symptoms of High Thyroid Activity

- Fatigue
- Insomnia
- Weakness
- Nervousness
- Palpitations
- Heat intolerance
- Eye complaints
- Increased sweating
- Light menstruation
- Loose or soft nails
- Irritability
- Rapid pulse
- Irregular heartbeat
- Finger tremor
- Shortness of breath
- Frequent bowel movements
- Decreased concentration
- Weight loss
- Fine, soft hair
- Hair loss
- Anxiety
- Increased libido
- Increased appetite
- Increased blood pressure

We heard a tragic story from a mother whose 26-year-old daughter was being treated for an overactive thyroid gland. She was given **Tapazole** (methimazole) to suppress her thyroid, but she was not told that this drug could reduce her ability to fight infection by reducing her production of white blood cells.

Despite a clear warning in the prescribing information to have patients report sore throat, fever or other symptoms of infection, this young woman was treated for many sore throats, strep infections, tonsillitis and gingivitis without a blood test. The doctor treating her failed to connect her series of infections with an adverse effect of her treatment for Graves' disease. When she finally was admitted to the hospital with stomach ache, dizziness, vomiting and fever, she had a severe infection and no white blood cells. She died the next day.

Treatment of thyrotoxicosis can be complicated. Doctors must choose between surgery, radiation or thyroid-suppressing drugs such as **Tapazole** (methimazole) or propylthiouracil. Each form of therapy has its advantages and drawbacks, and must be tailored to the individual patient.

Radioactive iodine is usually the treatment of choice for Graves' disease. Iodine concentrates in the thyroid gland, and delivers its dose of radiation there where it is needed. This treatment destroys thyroid gland tissue and as a consequence, it is irreversible. If there is any question about the accuracy of the diagnosis, a different therapy might be preferred. In addition, most people treated with radioactive iodine for Graves' will eventually become hypothyroid. Like other hypothyroid people, they will need to take thyroxine to supply the hormone their thyroids cannot make.

The thyroid-suppressing drugs methimazole and propylthiouracil are frequently used to treat hyperthyroidism. The dose is adjusted to the lowest amount that results in normal T_3 and T_4 levels. Methimazole is usually taken once a day, so it is more convenient. However, for pregnant or nursing women, propylthiouracil (taken three times daily) is considered preferable. (Radioactive iodine treatment is inappropriate during pregnancy, as it may affect the infant's thyroid gland.) Side effects of the medications include bitter taste and nausea. Skin rash, joint pain or an increase in temperature may indicate a serious reaction; the doctor should be notified promptly. Methimazole occasionally suppresses infection-fighting white blood cells, leading to a series of sore throats or other infections. If this problem is not detected in time to reverse it, the patient may die. Some people recover from hyperthyroid conditions after a year or two of thyroid-suppressing medication, but no thyroid treatment should be discontinued without close medical supervision.

Surgery to remove excess thyroid tissue is another possible treatment. It requires careful presurgical treatment. Although complications are uncommon,

surgery is less commonly recommended for adults except in the case of certain large nodules or in the case of cancer. Look for a surgeon with plenty of experience.

When treatment for overactive thyroid is begun, a beta-blocker like **Inderal** (propranolol) may be used to treat uncomfortable symptoms such as palpitations or rapid heart rate, tremor and anxiety. This medicine will not correct the thyroid problem, though, so thyroid treatment is also needed.

Drug Interactions

There are a number of medicines that can interact with thyroid hormone supplementation. Abnormal levels of thyroxine in the blood can affect the metabolism of asthma medicines like theophylline (**Bronkodyl**, **Slo-Phyllin**, **Theolair**, etc.) or aminophylline. Other drugs that interact are listed opposite.

Lithium (**Eskalith**, **Lithane**, **Lithobid**, etc.), used to treat manic-depressive disorder, can throw the thyroid gland out of kilter, causing enlargement (goiter), hypothyroid or, rarely, hyperthyroid conditions. Occasionally the heart drug amiodarone (**Cordarone**) will suppress the thyroid gland so that treatment is needed. **Aredia** (pamidronate), for abnormal calcium metabolism, may also alter the thyroid gland's equilibrium. Check with your pharmacist and doctor to make sure any medicine you are taking is safe in combination with your thyroid hormone.

Never discontinue a thyroid hormone medication, regardless of which one you take, without your physician's supervision. Most people diagnosed with a thyroid problem need treatment for the rest of their lives.

Thyroid Treatment in Older People

Thyroid conditions in older adults may be more difficult to detect. For one thing, some of the symptoms of an underactive thyroid, such as fatigue, forgetfulness or constipation, may be accepted by patients and families alike as inevitable signs of

aging. So might the palpitations, nervousness or weakness that may be caused by excessive thyroxine.

Sometimes older people have unusual symptoms. Too much thyroid hormone can cause loss of appetite, congestive heart failure, depression, dementia, apathy, constipation or muscle rigidity in elderly persons. Hair loss involving body and even pubic hair may not be mentioned or recognized as a possible symptom of hypothyroidism. The clinical picture can be so different from the "textbook" picture of thyroid disease that the condition might not even be suspected.

Thyroid function tests may show elevated levels of TSH in older people even when they don't seem ill. In some cases, levels of free T₄ are normal. One study discovered around 15 percent of both men and women over 60 fell into this

category of "subclinical hypothyroidism."

The question of whether these people should be treated is extremely controversial. Experts agree that if there are symptoms of an inactive thyroid, treatment with the lowest effective dose of thyroxine is appropriate. Some elderly people with no initial symptoms eventually develop obvious hypothyroidism that requires treatment. It is crucial not to overtreat the elderly, because heart disease and osteoporosis could both be made worse by overzealous thyroid treatment. Older people also seem to metabolize thyroxine more slowly, and may need lower doses initiated more gradually than younger patients. This is especially important if a person already has some heart disease and is taking a medication like digoxin.

SOME DRUGS THAT INTERACT WITH THYROID HORMONE

<i>Aminoglutethimide</i> Cytadren	Long-term treatment reduces T ₃ , T ₄ and raises TSH
<i>Antacids</i>	Aluminum or calcium-containing antacids may interfere with absorption, reducing effectiveness
<i>Androgens</i> <i>testosterone,</i> Halotestin, Testred, etc.	Androgens increase the effects of thyroxine. Lower dose (25-50%) may be needed.*
<i>Antidepressants</i> Elavil, Tofranil, <i>and other tricyclics</i>	Thyroxine increases antidepressant action; more side effects from both drugs.
Paxil, Prozac	Rare reports of thyroid dysfunction
<i>Asthma medicine</i> <i>aminophylline, theophylline</i>	Hypothyroid people metabolize these drugs slowly; with thyroxine, they may need a higher dose of asthma drug.
<i>Blood thinners</i> Coumadin	Anticoagulant action is increased by thyroxine; dangerous bleeding possible.
<i>Cholesterol medicine</i> Colestid, LoCHOLEST, Questran, Welchol	These drugs may reduce thyroxine absorption. Take at least 4 hours apart.
<i>Diabetes medicine</i>	Thyroxine replacement lowers effectiveness.
<i>Epilepsy drugs</i> Dilantin, Tegretol	These may increase thyroxine requirements.
<i>Heart drugs</i> <i>Beta blockers</i>	An increase in thyroxine may decrease the effectiveness of these medicines; beta-blockers may reduce T ₄ to T ₃ conversion
Digoxin (Lanoxin)	Blood levels of digoxin decrease as levels of thyroxine increase.
<i>Interferon alfa</i> Intron A	Long-term use may lead to thyroid antibodies and thyroid malfunction.
<i>Niacin, slow-release</i>	T ₄ and thyroxine-binding globulin (TBG) may drop

Thyroid and Iron

Millions of people take **Synthroid** daily, but taking 300 mg of the iron supplement ferrous sulfate at the same time can reduce the effectiveness of levothyroxine.

Blood tests showed less thyroxine circulating in the blood stream. Patients who took **Synthroid** with iron also had more symptoms of hypothyroidism, such as fatigue, menstrual irregularities and chilling.

The researchers suggest that "separating the times at which the two drugs are ingested by 2 or more hours" might limit this interaction.

[Campbell et al. "Ferrous Sulfate Reduces Thyroxine Efficacy in Patients with Hypothyroidism." *Annals of Internal Medicine* 1992; 117:1010-1013.]

Thyroid and Calcium

Few studies have been done to determine if calcium supplements interact with levothyroxine to reduce its absorption. Three cases have been reported of women whose thyroid pills (**Levothroid, Synthroid**) became less effective, as measured by blood tests and clinical symptoms, when they were taken at the same time as calcium carbonate (**Os-Cal** and **Tums**). It's a good idea to take these two pills four hours apart.

[Schneyer. "Calcium carbonate and reduction of levothyroxine efficacy." *JAMA* 1998; 279:750.]

*Arafah. "Decreased Levothyroxine Requirement in Women with Hypothyroidism during Androgen Therapy for Breast Cancer." *Ann. Intern. Med.* 1994;121:247-251.

Thyroid Problems in Children

Because thyroid hormone is crucial for growth and development, babies are now screened at birth to make sure their levels are adequate. In parts of the world where iodine is scarce, cretinism affects some vulnerable children who end up with inadequate thyroid hormone in the womb and from infancy onward. In the United States, cretinism has become a rarity since the introduction of iodized salt, which provides an ample amount of iodine in food everywhere in the country.

Neonatal screening discovers the one baby in 4,000 born without enough thyroxine. Treatment with replacement hormone wards off the physical and mental stunting that might otherwise occur. A baby with severe untreated hypothyroidism may lose three to five IQ points within the first year of life. In children who develop thyroid insufficiency after babyhood, one of the earliest signs may be a change in the growth curve. This is one of several reasons for keeping track of a child's weight and height. As for adults, treatment requires finding the appropriate dose of thyroxine, based on TSH tests.

Children may also develop Grave's disease, although this is very rare in young children. Parents may notice emotional disturbances more than the physical symptoms typical of hyperthyroid conditions in adults. Treatment may differ, too, as the long-term safety of radioactive iodine treatment in children has been questioned. As a result, doctors are more likely to recommend thyroid-suppressing drugs or surgery for children or adolescents diagnosed with Grave's disease.

Other Reasons for Thyroid Treatment

In the past, doctors sometimes prescribed thyroid hormone for conditions such as obesity or chronic tiredness, but this has been discouraged

for years. Occasionally people with access to thyroxine will even try to treat themselves for such problems, but getting thyroid hormone you don't need isn't good for you and can cause signs of hyperthyroidism. To determine if you truly need thyroxine that may have been prescribed originally for unclear reasons, the doctor may ask you to stop treatment, and then do a blood test after four weeks. If all blood tests are normal at that point, the doctor may decide thyroxine is unnecessary.

Natural Treatments

Many people would like to find an herbal medicine that would correct thyroid imbalance naturally. Although some plant substances can change thyroid function, the results are unpredictable. The resin guggul from India, used to lower cholesterol, is reputed to increase thyroid hormone production, but its utility in treating hypothyroidism is not known.

Some people attempt to treat thyroid problems with natural sources of iodine such as seaweed. Although some iodine is crucial, large doses of iodine can be harmful.

The best way to use a more natural approach to thyroid treatment may be to integrate Armour thyroid with a synthetic levothyroxine, as described on page 4. This poses a dilemma for the vegetarian, however. Armour is derived from animal sources. In addition, relying heavily on soy as a primary protein source can also put a strain on the thyroid. A prudent limit is three or four servings of soy per week.

The minerals selenium (50 mcg) and zinc (15 mg) are important for thyroid health. If the diet does not contain good sources of these, such as whole grains, fish, lean beef or soy, a supplement is recommended.

If you have questions or comments, feel free to write:

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You may also wish to order a CD of our interview with Dr. Ridha Areem: Call **(800) 732-2334** and request show #393. The cost of \$15 includes shipping & handling.

Thyroid Fighting Foods?

Certain foods contain a chemical that can block thyroid hormone. A diet that relies heavily on one or more of these can result in the development of a goiter, in which the thyroid gland grows larger in an attempt to make more thyroxine.

There is no evidence that these foods interfere with thyroid treatment when eaten in normal amounts, but prudence would suggest moderation in consuming:

- broccoli
- brussels sprouts
- cabbage
- cauliflower
- millet
- mustard greens
- peanuts
- radishes
- rutabaga
- soybeans
- turnips

For More Information:

The Thyroid Foundation of America, Inc.

Ruth Sleeper Hall, Rm. 350
40 Parkman St.

Boston MA 02114

Phones:

(800) 832-8321

(617) 726-8500

Web site:

www.about.com/mbody.htm

Recommended Reading:

The Thyroid Solution

by Ridha Areem, M.D.

Ballentine Books, 1999.

The Thyroid Book

by Martin I. Surks, M.D.

Consumer Reports, 1993.