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"RESEARCH ON NATURAL REMEDIES OF HYPERTHYROIDISM AND HYPOTHYROIDISM AND IDENITIFY NEW SYMPTOMS, TREATMENT REGIMENAND ROLE OF DOCTOR OF PHARMACY.

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1. ABSTRACT

The Thyroid gland regulates a wide range of physiological functions in the Body including growth, metabolism and energy. homeostasis, via secretion of thyroid hormone clinical labnormalities and manifestation are identified by regular bloodpressure and pulse rate, TSH levels and during hospitalized patients, To prevent this hyperthyroidism and hypothyroidism, Natural remedies, supplements, minerals and also take some food habits and avoid some food habits to out come the benefits to the patients and life style modification, identified the clinical features in clinical practice in,thyroid patients Natural ways, risk factors, complications. As most clinicians know, many patients prefer trying safe but possibly ineffective treatments before trying possibly unsafe but effective remedies. Similarly, patients frequently avoid recommended pharmaceutical drugs to avoid potential side effects such as psychological or physiological dependence. Subclinical hypothyroidism is one scenario where these concerns may seem particularly relevant. Let's say we have a patient with subclinical hypothyroidism(a slightly elevated TSH and a normal. serum T4 and T3) that is mildly symptomatic. One could argue that prematurely starting levothyroxine could potentially further suppress an already low level of endogenous thyroid synthesis. Furthermore, in the absence of good assays for the many nutrients and enzymes involved in thyroid production, how do we know that exogenous hormones would not mask a reversible cause?. Given the potential for harm with early hormone treatment, it is reasonable to offer patients a closely monitored trial of maximized non-drug thyroid support: Iodine 150-600 mcg PO daily (for those at risk of deficiency.) Reduction of dietary iodine if excess

suspected. Selenium 50-300 mcg PO daily (~2 brazil nuts daily.) Zinc 10-40 mg PO daily. Ferrous sulfate 325 mg PO daily (65 mg elemental iron). Vitamin A 800-3,000 mcg PO daily. L-Tyrosine 500 mg PO 3 times daily.

2. INTRODUCTION (FIG:1,2,3,4,5)

Thyroid is butterfly shaped gland that site low on the front of the neck, your thyroid lies below your Adams apple along the front of the wind pipe, thyroid has two side lobes connected by abridge isthmus in the middle, the disease which under goes due to imbalance in the production of thyroid hormones, they are hyperthyroidism and hypothyroidism, thyroid nodules, the gland synthesis stores and secretes two major metabolically active hormones, tridothyronin, t3,thyroxine t4,hormones synthesis and releases achieved by involving the gland.

General principles

Ideally, the first step in treatment is to eliminate or mitigate the effects of known or suspected causes of the thyroid dysfunction, such as medications, nutrient deficiencies, or systemic illnesses. In most cases one need not delay treatment of primary hypothyroidism to determine the exact cause. Once treatment is begun, using a slightly narrower target serum TSH range (0.5-3.0 micro units/ml) may produce better results than simply targeting the normal range (0.4-4.0 micro units/ml).3 While the goal of therapy conventionally focuses on the restoration of objective measures of a euthyroid state (such as normalization of TSH, body temperature, etc), successful resolution or improvement of symptoms also must be targeted in the larger care plan. Articulating such goals between physician and patient may be helpful.

3. CAUSES OF HYPOTHYROIDISM

CAUSE

Primary hypothyroidism

Chronic autoimmune thyroiditis

(aka Hashimoto's thyroiditis)

Iodine deficiency or excess Iatrogenic Drugs

Postpartum thyroiditis. Infiltrative diseases Agenesis/dysgenesis Non-thyroid illness

Central hypothyroidism

Secondary hypothyroidism (pituitary lesion) Tertiary hypothyroidism (hypothalamic lesion)

4. DIAGNOSTIC CLUES

TPO antibodies, thyroglobulin antibodies Goiter, hx of at-risk location (e.g., land-locked), diet (e.g., seafood) or excessive iodine supplementation Hx of surgery or radiation Amiodarone, iodinated contrast or lithium TPO antibodies, thyroglobulin antibodies Hx of sarcoidosis, tuberculosis Congenital hypothyroidism Hx acute severe illness or trauma, transient changes in TSH Low, normal or mildly elevated TSH; low free T4 and total T3 Low, normal or mildly elevated TSH; low free T4 and total T3.

PEARLS FOR CLINICIANS

5. Epidemiology of hyperthyroidism and hypothyroidism in clinical practice

Hyperthyroidism effects approximately 2%of women, 0.2%of men, it rarely occurs in children, it is seen usual in the first 5yrs of life between the age of 10to 12 years, the total prevalence is order of 20 per 1000 women and,, <1per 1000men. (TSH 0.5to4.7),(T3 1.1to 2),(T4 0.6 TO 1.2) NORMAL VALUES,

6. IDENTIFY THE NEW SYMPTOMS FROM 2009TO2015ON THYROID PATIENTS

DATE	PR	BP	SYMPOTOMS	T3	T4	TSH
13/5/09	68	120/80	SWELLING OVER throat Pain, appetite, hypo plastic goiter	1.3	1.11	15.30
27/7/09	76	120/80	hand pains	1.3	1.11	
2/8/09	68	130/80	headache, soreness mouth	1.3	1.11	2.96
9/11/09	76	130/80				
8/2/10	76	130/80	dyspagea		4.9	
9/9/10	68	120/80	throat, palpitations		0.9	
25/10/10	72					
23/8/11	74	110/80	finger and knee pain		2.5	
17/8/11	72	110 /80	joint pain and fever			
23/4/11	72	110 /80	joint pain, bile pigments (-)			
14/4/12	68	130/80	muscle and joint pain		7.7	
14/7/12	68	130 /80	eye lashes loss			
19/12/12	70	130/80	halotious(bad breath)			
23/4/13	72	110 /80	joint pain			
14/12/13	68	130 /	muscle and joint pain		8.1	

DATE	PR	BP	SYMPTOMS	T4	T3	TSH
22/4/14			hoarse voice			
20/8/14	60	130 /80	palpitation			
4/12/14						
4/1/15	72	140/80	asthenia cough		8.31	
15/5/15			multi nodular goiter			
26/8/15			UTI			
3/12/15						

7. Clinical feature hyperthyroidism and hypothyroidism of patients (fig: 1, 2,3,4)

HYPERTHYROIDISM

General - heat, weight loss, appetite, sweating, hair loss, soft nails, muscle ache, brittle hair, perspiration, boneless, serum cholesterol.

Eyes - loss of visual, acidity, bulging eyes.

Neck - enlarged goiter

Cardiac - palpation, pulse, heart beat, cholesterol

Git - diarrhea, hyper defection, regular gas, constipation, nausea, vomiting, diarrhea

Genitourinary - amenorrhea, infertility, menstrual, periods, loss of libido

Neuromuscular - fatigue, weakness, tremor, sleeping difficulties, nervous Ness, depression, memory loss, Symptoms and sign of hyperthyroidism are due to increasing body's metabolic functions NEW SYMPTOMS: HYPOPLASTICGOITRE, DYSPHAGIA, EYE LASHES LOSS, scanty menstrual

Hypothyroidism

Skin and appendages dry cool., thickened skin, decreases sweating, dry skin, puffy face, itching, eyes, loss of eye brow hair Neuro muscular system dementia, low speech, poor memory, hearing loss, depression, feeling tired ness, snoring, Neck enlarged thyroid Metabolic abnormalities macrocytes, anemia, cool extremist and swelling of limbs Git - weight loss, constipation.

CVS - decreases the Cardiac out Put, bradycardia, Cardiac enlargement, General - muscle cramps, joint aches, alopecia, Genitourinary – Dysmonnorhia

NEW SYMPTOMS - OBESITY, PINS NEEDLES, UTIINFECTION, CANDIDA, HOARSE VOICE, Muscle cramps, salt cravings, eye lash loss, Mouth and throat - choking Fite, halitous(bad breath) Nails-peeling, flaking Skin - dark rings under eyes, dermographai, pain tendinitis, heal spur.

Natural remedies for hyperthyroidism and hypothyroidism Mushrooms, turmeric, selenium, iodine, coffee fiber contents, ginger, lemanbalm, onion, ashwagandha, fenugreek, vinegar Brazil nuts, salmon, brown rice, eleuthero.

8. WHY TO TAKE NATURAL TREATMENT

I realize at this point you might be thinking that I simply have a based opinion and my opinion is must give and treat the natural treatment method, now following days and future, beside a being unsure as to whether or not natural treatment methods could truly help restore my health back to normal. Hyperthyroidism may contribute to thinning bones, it is important to get enough calcium every day to help prevent osteoporosis. Hypothyroidism patients calcium suppliments and iron suppliments not to given while taking levothyroxine drug

Natural ways to reduce hyperthyroidism and hypothyroidism in patients

Too little or too much iodine

The Thyroid much have iodine to make thyroid hormones, iodine comes into the body in foods, mainly dairy products, chicken, beef, pork, fish, ionized salt, the iodine then travel through the blood to the Thyroid.

9. Natural remedies for hypothyroidism

You've probably heard this complaint time and again from clients who have thyroid disease— and with good reason. To the great frustration of many of the 27 million Americans

with thyroid gland issues, the thyroid has a profound impact on metabolism. Unintended weight gain and weight loss are common, and both can be a daunting challenge to rectify. Although weight may be the most common complaint, clients are at an increased risk of cardiovascular disease and diabetes, underscoring the need to eat a balanced diet and adopt a healthful lifestyle. But since one-half of all people with thyroid disease are undiagnosed and weight changes are a common symptom,1 RDs are in a prime position to spot potential thyroid conditions, make appropriate referrals, and help clients get a timely diagnosis and the treatment they need. This continuing education activity will provide an overview of thyroid disease, its relationship with cardiovascular disease and diabetes, and the role nutrition plays in maintaining thyroid health.

Thyroid 101

The thyroid gland is a 2-inch butterfly-shaped organ located at the front of the neck. Though the thyroid is small, it's a major gland in the endocrine system and affects nearly every organ in the body. It regulates fat and carbohydrate metabolism, respiration, body temperature, brain development, cholesterol levels, the heart and nervous system, blood calcium levels, menstrual cycles, skin integrity, and more.1

The most common thyroid condition is hypothyroidism, or underactive thyroid. In the United States, hypothyroidism usually is caused by an autoimmune response known as Hashimoto's disease or autoimmune thyroiditis. As with all autoimmune diseases, the body mistakenly identifies its own tissues as an invader and attacks them until the organ is destroyed. This chronic attack eventually prevents the thyroid from releasing adequate levels of the hormones T3 and T4, which are necessary to keep the body functioning properly. The lack of these hormones can slow down metabolism and cause weight gain, fatigue, dry skin and hair, and difficulty concentrating (see table below).2 Hashimoto's affects approximately 5% of the US population, is seven times more prevalent in women than men, and generally occurs during middle age.

10. Nutrition and Supplements

Iodine. Dietary iodine is an essential nutrient upon which thyroid function depends. Iodine is concentrated in the thyroid gland and is incorporated into the thyroid hormones. (See diagram on page 6). Noting the ubiquitous need of iodine by cells throughout the range of life, some have posited that the thyroid gland developed as a means of concentrating and storing this plentiful ocean resource as vertebrate life moved onto land.7

As mentioned previously, iodine deficiency remains a significant cause of hypothyroidism worldwide, typically in land-locked, impoverished parts of the world. Such chronic, overt deficiency is associated with diets containing less than 50 mcg/day, but this is rare in industrially developed nations.8 Iodized salt, saltwater fish and sea vegetables are the main dietary sources of iodine. While urinary iodine and thyroglobulin levels have been successfully utilized as biomarkers of iodine status in human populations, it is unclear how reliable they are in diagnosing iodine deficiency states or response to treatment in individuals.8,9 Although uncertainty may remain, the best test at this time for iodine deficiency is a 24 hour urine iodine of less than 100 mcg/L.9,10

Standard supplementation of dietary salt and vegetable oil has eliminated iodine deficiency in many parts of the world.11 The Recommended Dietary Allowance (RDA) of iodine is 150 mcg per day for adults.12 One half teaspoon of iodized salt supplies about enough to satisfy this recommendation. The average American gets more than twice this amount of sodium daily. However, some individuals, such as those on a strict sodium restriction diet, may not meet this RDA for iodine; such individuals may consider including sea vegetables in their diets.

The Tolerable Upper Intake (TUI) level of iodine is 1,100 mcg per day for adults.12 Excess iodine can actually cause a transient hypothyroidism that resolves with discontinuation of high doses. This can be seen in individuals or populations consuming large amounts of seafood, iodine supplements or sea vegetables (see Botanicals below.)

Selenium. Adequate selenium is also required for proper thyroid function.13 (See diagram on page 6). Specifically, selenium facilitates conversion of T4 to the active T3 through 10 selenium-dependent deiodinases. Correcting selenium deficiency may improve concurrent thyroid dysfunction.

It is unclear to what extent selenium benefits patients with hypothyroidism in the absence of a selenium deficiency. There is some evidence that selenium supplementation does reduce thyroid peroxidase antibody (TPO) levels in patients with autoimmune thyroiditis.14

It has also been found to improve well-being and mood in this population.14 Caution should be taken, as selenium can worsen thyroid function with concurrent iodine deficiency. In such cases, selenium and iodine can be supplemented simultaneously. Selenium can also be associated with toxicity. The RDA for selenium is 55 mcg per day.12

The TUI is 400 mcg per day for adults (e.g., 3-4 Brazil nuts). Other nutrients: Vitamin A, Iron and Zinc. A myriad of other vitamins and nutrients influence thyroid function, most notably Vitamin A, iron and zinc. (See diagram on page 6). By various mechanisms, these three have been experimentally demonstrated to be permissive and supportive of thyroid function.10,15,16 Consider supplementing with them in hypothyroidism, especially if deficiency states are suspected.

Recommended daily doses based on the RDAs and TUI for adults are as follows

o Zinc 10-40 mg/day. (Avoid taking with other minerals due to absorption inhibition) o Iron 12-45 mg/day (in elemental iron… 5 mg ferrous sulfate provides 1 mg elemental iron.)

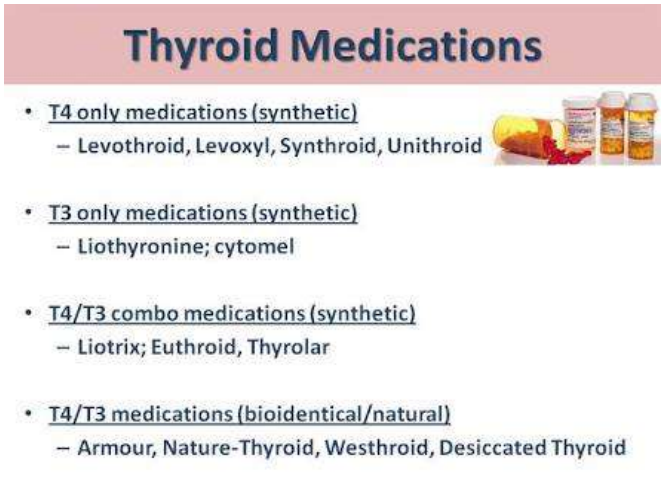
o Vitamin A 800-3,000 mcg/day.

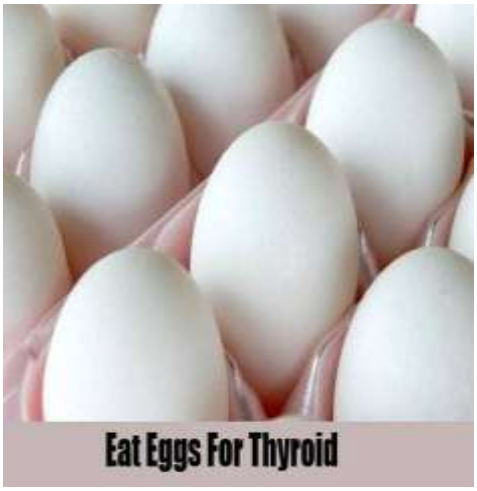
L-Tyrosine. Thyroxin (T4) is naturally produced from the iodination of tyrosine, a nonessential amino obtained both from dietary sources and endogenous conversion of phenylalanine. (See diagram on page 6). Supplementation with L-tyrosine (one of its naturally occurring isomers) is commonly used to support thyroid function. Given its role in thyroxin production, tyrosine availability could theoretically affect thyroid function.18 17

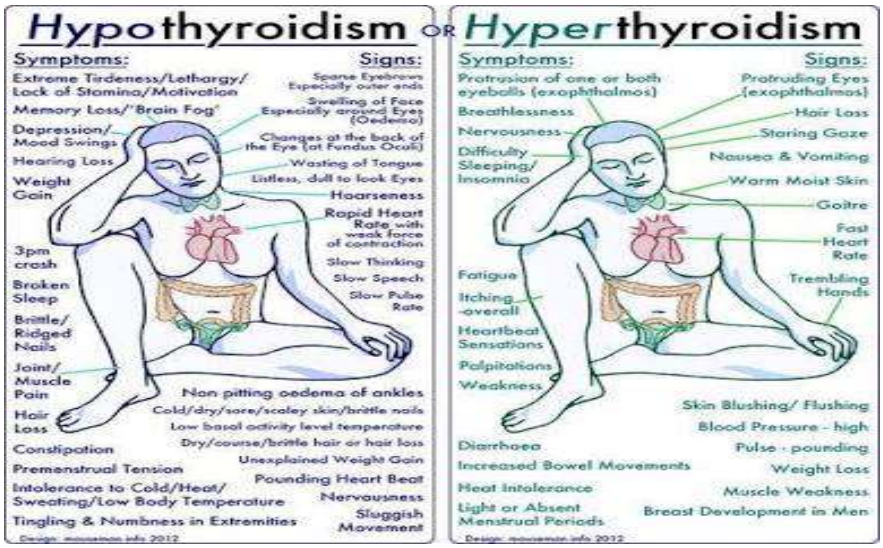
While L-tyrosine has been shown to improve sleep deprivation associated deficits, the time of onset (~3 hours) makes it unlikely that these effects are mediated by a change in thyroid function. While such observed effects as improved alertness and psychomotor function17 could potentially improve symptoms of hypothyroidism, these effects of tyrosine could be mediated via its role in the production in melatonin, dopamine and/or norepinephrine. Regardless, this dietary nutrient is generally safe. The usual dose is 500 mg L-tyrosine 23 times daily before meals.

2. Botanicals and Sea Vegetables

Sea Vegetables. Sea vegetables or seaweeds contain variable amounts of iodine depending on the species, local environment and preparation. Consider including them in the diet for those with suspected iodine deficiency and reducing or eliminating them for those suspected as having excess iodine.







11. COMPARISON OF SEA VEGETABLES TO OTHER SOURCES OF IODINE19,20

Food

Sea vegetables

Kelp Nori Dulse

Other foods

Iodized Salt Cod

Cow's Milk

Potato (with peel)

Minimum Amount Needed to Meet Daily Intake Requirement*

9 mg = 0.0003 oz/day

9 g = 0.3 oz/day 2 g = 0.07 oz/day 2 g or ~1/3 tsp/day

4.5 oz/day (~1.5 servings)

3 cups/day

2.5 medium size

Maximum Amount for Daily Intake Requirement*

70 mg = 0.0025 oz/day

69 g = 2.4 oz/day 15 g = 0.5 oz/day 14g or ~2.5 tsp/day

33 oz/day 20 cups/day

18 medium size

*These amounts are estimates. Actual content of foods vary considerably based upon growing Guggulu (Commiphora wightii). Guggulu (variously known as or guggal, guggul lipid, etc) is a gum resin of a small tree used in Ayurvedic medicine. Its high fiber content is used as a possible cholesterol-lowering agent. A fraction called guggulsterone has been found to have thyroid stimulating effects,21 but further research is needed.

Goitrogens. There are numerous foods that may contribute to thyroid dysfunction. The brassica genus of vegetables (broccoli, cabbage, cauliflower, turnips, etc) and soy both impair thyroid function by directly inhibiting thyroid perioxidase. (See diagram on page 6). Other potentially important goitrogens include cassava and millet. Notably, these negative effects (specifically with soy and brassica vegetables) are not seen in the absence of iodine deficiency.10,22 Making sure iodine consumption is adequate is probably the best way to

avoid goitrogenic effects of these otherwise generally healthy foods. Others have suggested that cooking helps to prevent or mitigate the effects of these goitrogenic foods.

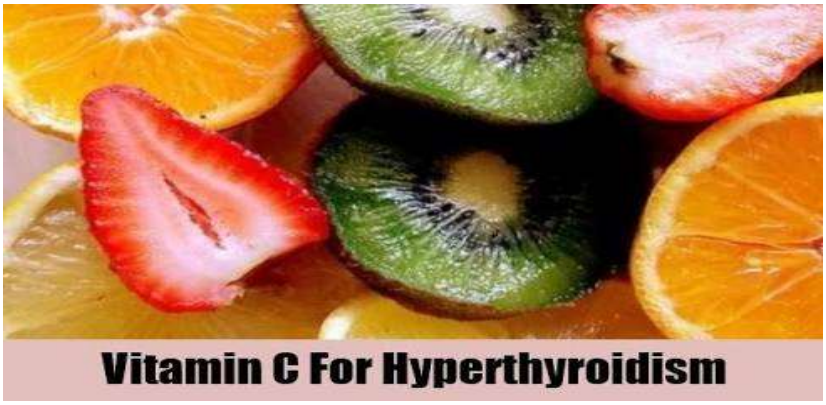
12. What Can I Try to Encourage Thyroid Health in a Patient before Starting Hormones?: As most clinicians know, many patients prefer trying safe but possibly ineffective treatments before trying possibly unsafe but effective remedies. Similarly, patients frequently avoid recommended pharmaceutical drugs to avoid potential side effects such as psychological or physiological dependence. Subclinical hypothyroidism is one scenario where these concerns may seem particularly relevant.

Let's say we have a patient with subclinical hypothyroidism (a slightly elevated TSH and a normal serum T4 and T3) that is mildly symptomatic. One could argue that prematurely starting levothyroxine could potentially further suppress an already low level of endogenous thyroid synthesis. Furthermore, in the absence of good assays for the many nutrients and enzymes involved in thyroid production, how do we know that exogenous hormones would not mask a reversible cause?

Given the potential for harm with early hormone treatment, it is reasonable to offer patients a closely monitored trial of maximized non-drug thyroid support:
Iodine 150-600 mcg PO daily (for those at risk of deficiency.) Reduction of dietary iodine if excess suspected. Selenium 50-300 mcg PO daily (~2 brazil nuts daily.) Zinc 10-40 mg PO daily.

Ferrous sulfate 325 mg PO daily (65 mg elemental iron). Vitamin A 800-3,000 mcg PO daily. L-Tyrosine 500 mg PO 3 times daily.

PEARLS FOR CLINICIANS



PEARLS FOR CLINICIANS

Gonodermasinensis (mushrooms) mushrooms tincture dry 1:5,70%alcohol, 20to60 drops Churcumalanga(turmeric) root (rhizome) tincture fresh 1:2 95%alcohol or dry root tincture (1:5,60%alcohol) consume 10to 60drops up to 3 times a day Coconut oil - it contains medium chain fatty acids that helps improve their energy metabolism Fish oil good for increasing the Thyroid hormone Ginger it contains zinc, magnesium,potassium, anti inflammatory property B. Vitamin vital role for healthy thyroid function Brazil nuts contains selenium reduces the weight Salmon - it is one of the best fish that you can eat for your thyroid healthy and metabolism, it almost significant to anti inflammatory.

Brown rice - people who has hypothyroidism often take carbohydrates more then other type of food Natural remedies in women the results of largest coffee study to data were that 500,000lakhs men and women age 50 to 71 over a1 4years span of time.

The coffee consumption was inversely associated with total and cause specific mortality. Those who drank coffee they live longer time Men 2to3drops of coffee per day decreased death in 10%men.

Selenium - is an essential dietary mineral that is part of various selenoenzymes, these compounds are in many antioxidants, oxidation, reduction Iodine - it is required by the Thyroid gland to function and make thyroid hormones, naturally occur in soil and oceans, 50%people in world are deficient in iodine can cause goiter Iodine get from broccoli, milk, salt, water, from foods (eggs, meat, Foods) Coffee fiber supplements lower the absorption of thyroid medication Lemanbalm topical treatments to be applied 2-3 times per day at onset of symptoms (burning, itching) Eleuthero - it contains complex polysaccharides, it plays a critical in eleuthero ability to support immune function, it was found to stimulate tcell

production. Dose 300mg - 400mg per day Lemon balm it is used in herbal teas, both for its flavour and it's mild sedative properties Ingredients perfumes and cosmetics Dosage 2 leaves +1cup boiling water.

Ginger contains zinc, MG, potassium, it's anti inflammatory property

B. Vitamins are essential for healthy thyroid function take edequate amount of b1,b2,b3,b5,b6,b7,b8,b9,b12

Coconut oil contain fatty acids

Vinegar help to regulate hormones and improve their energy metabolism Fish oil These are considered good for increasing thyroid hormones uptake and maintaining healthy thyroid functions.

13. Natural remedies for hyperthyroidism

Mother wort, lemanbalm, selenium, eleuthero, magnesium, iodine.

Ashwagandha (nithania sominifera) - root tincture 3 times a day, fresh 1: 2, dry (1:5 70%al,cohol adoptogenic herb, proven heal thyroid, adrenal issues, tulsi, Selenium - helps balance out T4 in your body hormones, example chicken eggs spinach.

B vitamins - balancing hormones naturally and treating chronic fatigue syndrome, eggs, milk. Integrative Treatment of Hypothyroidism As a major regulator of cellular metabolism, the thyroid gland influences an astonishing number of physiologic processes with include development and growth, thermogenesis, lipid and carbohydrate metabolism, cardiac myocyte activity, reproduction and cognitive functioning. This important gland is characteristic of vertebrates, and its secretions presumably affect every cell in the body, generally increasing metabolic rate. Accordingly, dysfunctional states of the thyroid gland are associated with numerous and fairly non-specific symptoms. Given the non-specific expressions and common occurrence of thyroid disease, concerns about thyroid function are frequently raised by clinicians and patients alike.

14. SIGNS AND SYMPTOMS OF HYPOTHYROIDISM

Fatigue

Weight gain from fluid retention Dry skin and cold intolerance Yellow skin

Coarse hair or loss of hair Hoarseness Goiter

Reflex delay, relaxation phase Ataxia

Constipation

Memory and mental impairment Decreased concentration Depression

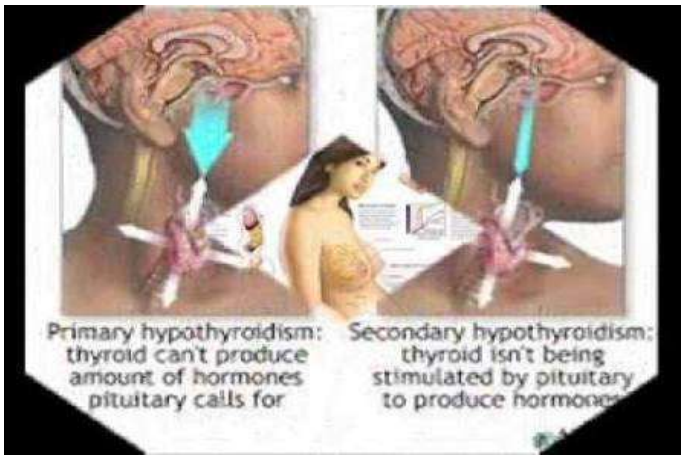
Irregular or heavy menses and infertility Myalgias Hyperlipidemia Bradycardia and hypothermia Myxedema fluid infiltration of tissues.

The array of thyroid disorders focuses on the outliers along the continuum of thyroid function (namely hypothyroidism and hyperthyroidism) based upon the production of T3 (triiodothyronine) and T4 (thyroxine). Hypothyroidism is the most common thyroid disease and is estimated to affect between 0.1 and 2% of the population,2 with rates in women as much as 10 times higher than in men.3 The elderly and pregnant also experience higher rates of hypothyroidism. Worldwide, iodine deficiency remains the most common cause of hypothyroidism,4 whereas in industrially developed parts of the world autoimmune hypothyroidism (Hashimoto's disease) is the most common thyroid disease. In the United States many cases of hyperthyroidism eventually lead to hypothyroidism either due to autoimmune "burnout" of the thyroid gland or medical interventions.

Worldwide, iodine deficiency remains the most common cause of hypothyroidism, whereas in industrially developed parts of the world autoimmune hypothyroidism (Hashimoto's disease) is the Untreated patients with hypothyroidism and hyperthyroidism the following

complication The only danger of drugs are caused by taking too little or too much, if you take too little, your hypothyroidism will continue, if you take too much, you can develop the symptoms of hyperthyroidism an overall active thyroid.

Evidence regarding the complication of hyperthyroidism the early treatment might prevent the atrial fibrillation (low TSH) osteoproticfractures (bone loss)



15. Evidence regarding the complication of hypothyroidism are hyperlipidemia, atherosclerosis

Hyperthyroidism

Heart problems, brittle bones, eye problems, red swollen skin, thyrotoxic crisis.

Hypothyroidism

Goitre, heart problems, mental health issues, peripheral neuropathy, myx edema, infertility, birth defects

Nervousness (frequency: 99%)

Increased sweating (91%)

Palpitations (89%) or tachycardia (82%)

Heat intolerance (89%)

Fatigue (88%)

Weight loss (85%)

Shortness of breath (75%), weakness (70%)

Leg swelling (65%)

Eye symptoms (54%)

Hyperdefecation (33%)

Menstrual irregularity (22%)

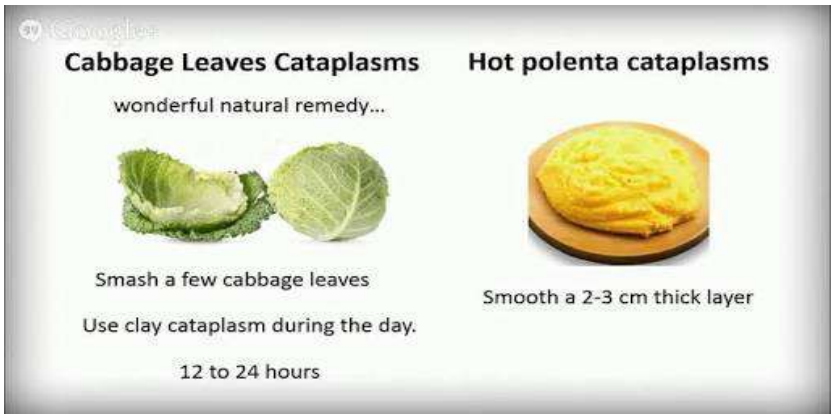
Emotional lability (30–60%)

Nervousness (frequency: 99%)

16. Life style changes to treat hypothyroidism and hyperthyroidism

Doctor will gradually increase dose until lab values are normal. Thyroid stimulating will be checked 6-8weeks after a change in the dose or medication

Hyperthyroidism - excessive weight loss, improve diet, add more calories and proteins, seek help of dietitian



Execive weight gain - Healthy eating, watch sodium and calcium

Thining of bones - get enough calcium, dosage depends on your ages

Avoid natural foods plants with hypo thyroid effects include cabbage, cauliflower, lima beans Lin seeds etc Natural treatment manage stress levels, eat an anti inflammatory diet, lower exposure to environmental toxic, treat sensitivity to the eyes and skin.

Exercise Veronica, sidelines, bicycle crunch, knee raise, Planck, hip raise, abdominal crunch, ball crunch, dumbell front squat. Vitamin - D includes fatty fish, milk, dairy, eggs. Honey is

the best moisturizer, lemon juice helps to get rid of skin discoloration, carrot juice promotes skin tissue healing, alovera helps fight free radicals.

Zinc--mushrooms, soy beans, fish, legumes, meals, nuts,
Vitamin p--bioflavinoids are water soluble compounds, citrus, cherries, grapefruits, greentea, lemon, oranges
Vitamin f--essential fatty acids, fruits, garlic, oranges, seeds, spinach, omega 3 fatty acids

Vitamin D - - butter, carrots, eggs, fish, garlic, leafy, green vegetables, milk, potato,
Not to take - vitamin-b, broccoli, cabbage, cauliflower, dark green leafy vegetables, soy beans.

Vitamin c, broccoli, cabbage, cauliflower, cucumber.

17. Risk factors for hyperthyroidism and hypothyroidism in patients

Autoimmunity, external irradiation of head and neck, other factors like female see, increase age, iodine deficiency Diagonising hypothyroidism early by testing newborn babies, pregnant women, and people with symptoms or risk factors is best way to prevent it from worsening.

While I would like to tell you that natural treatment methods come with out any risks. Hashmotis thyroiditis, recent pregnancy and child delivery.

Treatment

The disease process for Hashimoto's is a spectrum, and not all patients require treatment.

Some patients have autoimmune antibodies but retain enough thyroid function without the need for intervention for years. Generally, once the body can no longer produce an adequate amount of thyroid hormone for necessary physiological functions, thyroid replacement medication is necessary to correct the hormonal imbalances associated with hypothyroidism. Hyperthyroidism usually is treated with medications, surgery, or oral radioactive iodine. However, these treatments are imprecise and may cause the thyroid to secrete inadequate amounts of T3 and T4 and function insufficiently after treatment. Seventy percent to 90% of patients with Graves' or thyroid cancer eventually need treatment for hypothyroidism as a result of treatment.6

Cardiovascular Risk and Diabetes

Patients with hypothyroidism have a greater risk of cardiovascular disease than the risks associated with weight gain alone. Low levels of thyroid hormones lead to a higher blood lipid profile, increased blood pressure, and elevated levels of the amino acid homocysteine and the inflammatory marker C-reactive protein.6

Thyroid hormones regulate cholesterol synthesis, cholesterol receptors, and the rate of cholesterol degradation. Hypothyroidism increases LDL levels, and increased cholesterol levels have been shown to induce hypothyroidism, leading to a harmful feedback loop that has been illustrated most clearly in animal models. In humans, normalization of thyroid hormone levels has a beneficial effect on cholesterol, which may be worth noting especially for clients who choose not to take prescribed thyroid medications.7

Moreover, a strong relationship exists between thyroid disorders, impaired glucose control, and diabetes. Thirty percent of people with type 1 diabetes have ATD, and 12.5% of those with type 2 diabetes have thyroid disease compared with a 6.6% prevalence of thyroid disease in the general public. Both hypothyroidism and hyperthyroidism affect carbohydrate metabolism Weight It's imperative dietitians have a good understanding of the metabolic changes associated with thyroid disease so they can set realistic goals and expectations for clients. Most people with hypothyroidism tend to experience abnormal weight gain and difficulty losing weight until hormone levels stabilize. Moreover, it's common for patients with Graves' disease to experience periods of high and low thyroid hormone levels, so it may take several months to achieve a balance. During this time, it's essential clients focus on healthful behaviors such as eating nutritious foods, exercising regularly, managing stress, and sleeping adequately rather than focus on the numbers on the scale.

Clara Schneider, MS, RD, RN, CDE, LDN, of Outer Banks Nutrition and author of numerous books, including The Everything Thyroid Diet Book, says, "The No. 1 priority is to get the thyroid disease under control. Clients need to have labs and medications addressed first.

Weight changes are just not going to happen before all of that is under control." She notes that Hashimoto's typically occurs around menopause, which compounds the weight gain issue that many women experience during that time.

"The biggest factors that help with weight loss are calorie- and carbohydrate-controlled meal plans," says Sheila Dean, DSc, RD, LD, CCN, CDE, of the Palm Harbor Center for Health & Healing in Florida. "Naturally I try to ensure [clients are] eating a whole foods-based, minimally processed diet with at least 2 L of water daily." Schneider agrees that a heart-healthy eating plan is fundamental. "The diet should emphasize more vegetables, leaner meats, more beans, fiber, and fluids. We need to look at intake of sugars, added fats, fast food, and meals out."

Emphasizing lean proteins, vegetables, fruits, heart-healthy fats and omega 3s, high-fiber foods, and appropriate portions can help manage or prevent illnesses associated with thyroid disease. As Schneider notes, "It's eating for prevention of all these diseases that accompany thyroid disease: heart disease, diabetes, cancer, and more." As an added bonus, fiber can relieve constipation that people with hypothyroidism often experience.

18. Key Nutrients

Many nutritional factors play a role in optimizing thyroid function. However, both nutrient deficiencies and excesses can trigger or exacerbate symptoms. Working in collaboration with a physician is ideal to determine nutritional status for optimal thyroid health.

Iodine: Iodine is a vital nutrient in the body and essential to thyroid function; thyroid hormones are comprised of iodine. While autoimmune disease is the primary cause of thyroid dysfunction in the United States, iodine deficiency is the main cause worldwide.9 Iodine deficiency has been considered rare in the United States since the 1920s, largely due to the widespread use of iodized salt. This, along with fish, dairy, and grains, is a major source of iodine in the standard American diet. Iodine intake often isn't readily apparent on a dietary recall since the amount in foods is largely dependent on levels in the soil and added salt. However, Schneider says, "Clients taking iodine tablets are a red flag. Frequent intake of foods such as seaweed, which is high in iodine, or an avoidance of all iodized salt may serve as signs that further exploration is needed."

Vitamin D: Vitamin D deficiency is linked to Hashimoto's, according to one study showing that more than 90% of patients studied were deficient. However, it's unclear whether the low vitamin D levels were the direct cause of Hashimoto's or the result of the disease process itself.12

Hyperthyroidism, particularly Graves' disease, is known to cause bone loss, which is compounded by the vitamin D deficiency commonly found in people with hyperthyroidism. This bone mass can be regained with treatment for hyperthyroidism, and experts suggest that adequate bone-building nutrients, such as vitamin D, are particularly important during and after treatment.13

Foods that contain some vitamin D include fatty fish, milk, dairy, eggs, and mushrooms. Sunlight also is a potential source, but the amount of vitamin production depends on the season and latitude. If clients have low vitamin D levels, supplemental D3 may be necessary, and the client's physician should monitor progress to ensure the individual's levels stay within an appropriate range.

Selenium: The highest concentration of selenium is found in the thyroid gland, and it's been shown to be a necessary component of enzymes integral to thyroid function.14 Selenium is an essential trace mineral and has been shown to have a profound effect on the immune system, cognitive function, fertility in both men and women, and mortality rate.

A meta-analysis of randomized, placebo-controlled studies has shown benefits of selenium on both thyroid antibody titers and mood in patients with Hashimoto's, but this effect seems more pronounced in people with a selenium deficiency or insufficiency at the outset.15 Conversely, an excessive intake of selenium can cause gastrointestinal distress or even raise the risk of type 2 diabetes and cancer. So clients will benefit from having their selenium levels tested and incorporating healthful, selenium-rich foods in to their diets, such as Brazil nuts, tuna, crab, and lobster.15Vitamin B12: Studies have shown that about 30% of people with ATD experience a vitamin B12 deficiency. Food sources of B12 include mollusks, sardines, salmon, organ meats such as liver, muscle meat, and dairy. Vegan sources include fortified cereals and nutritional yeast.

Severe B12 deficiency can be irreversible, so it's important for dietitians to suggest clients with thyroid disease have their levels tested.16

Goitrogens

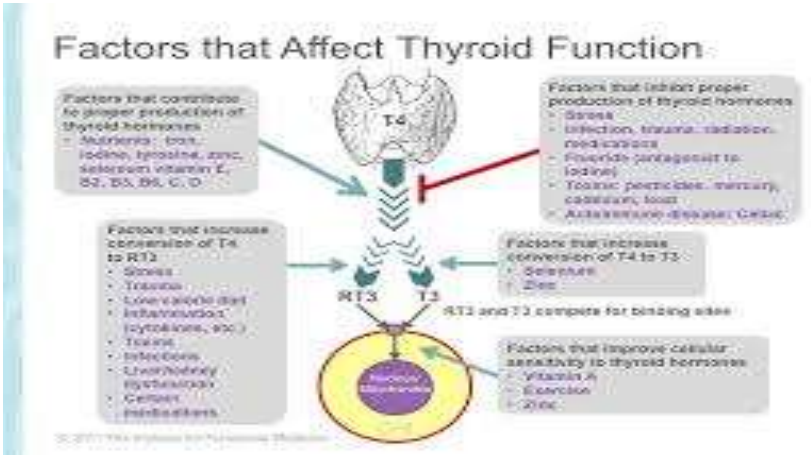
Cruciferous vegetables such as broccoli, cauliflower, and cabbage naturally release a compound called goitrin when they're hydrolyzed, or broken down. Goitrin can interfere with the synthesis of thyroid hormones. However, this is usually a concern only when coupled with an iodine deficiency.17 Heating cruciferous vegetables denatures much or all of this potential goitrogenic effect.18 "If you're eating three to four servings per week of cooked or even lightly steamed crucifers, generally it shouldn't have a negative effect on thyroid health and particularly if iodine consumption and tissue levels are adequate," Dean says.

Soy is another potential goitrogen. The isoflavones in soy can lower thyroid hormone synthesis, but numerous studies have found that consuming soy doesn't cause hypothyroidism in people with adequate iodine stores.19 While moderate soy intake (ie, levels found in food) gets a green light, concern remains for high-dose soy supplementation, specifically in people with preexisting compromised thyroid function. In addition to biological plausibility for thyroid suppression with soy consumption, a randomized, double-blinded study showed a threefold increase in the development of clinical hypothyroidism among women with subclinical hypothyroid levels when supplemented with high doses of soy. Iodine levels did not appear to be a factor.20

Clearly, given the prevalence of subclinical and overt thyroid disease and frequent supplemental soy intake, especially among postmenopausal women, more research is needed, However, Dean cautions clients to eat soy in moderation: "Certainly, I'm not encouraging soy-based supplements."

While a typical intake of cooked crucifers and soy are generally considered safe in people with adequate iodine, the potential exception is millet, a nutritious gluten-free grain, which may suppress thyroid function even in people with adequate iodine intake.21 If a dietary

recall indicates frequent millet consumption in patients with hypothyroidism, it may be wise to suggest they choose a different grain.



What About a Gluten-Free Diet?

Gluten sensitivity and gluten intolerance continue to be topics of discussion in the dietetics community, with speculation that a gluten-free diet may help relieve symptoms of various autoimmune conditions, including ATD. The two aspects of this theory involve the relationship between ATD and a gluten-free diet in people with celiac disease and the effect of a glutenfree diet in people with ATD without celiac disease.

The rate of celiac disease is significantly higher among people with ATD than the general population. Studies have shown that 2% to 4.8% of US adults with ATD have celiac disease and 7.8% of children with ATD have celiac disease vs. 1% of the general population.22 CeliacVitamin B12: Studies have shown that about 30% of people with ATD experience a vitamin B12 deficiency. Food sources of B12 include mollusks, sardines, salmon, organ meats such as liver, muscle meat, and dairy. Vegan sources include fortified cereals and nutritional yeast.

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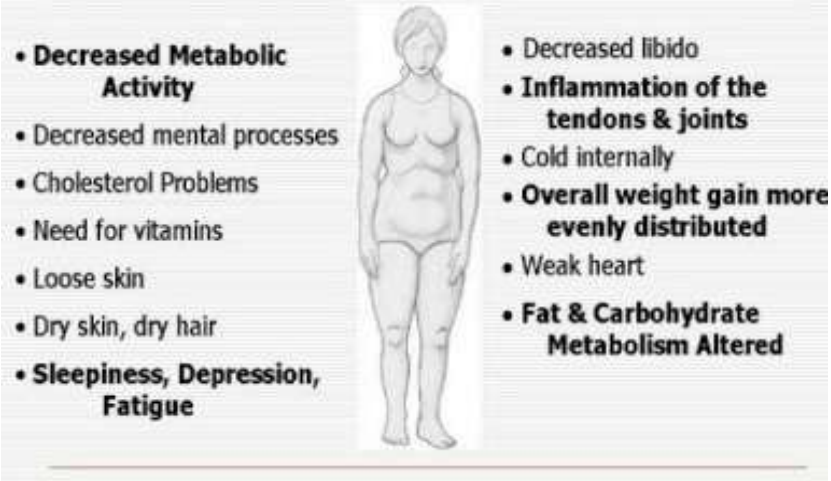

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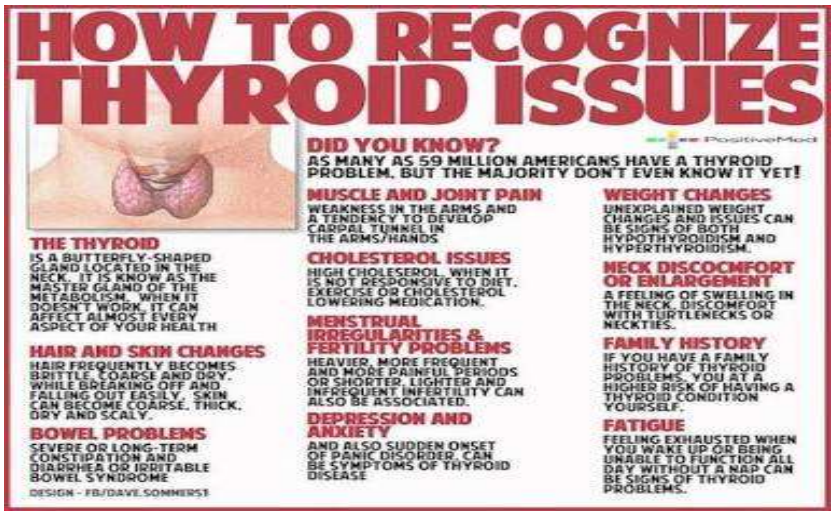

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19. DOSE OF NATURAL REMEDIES

Ashwagandha - 500mg daily
Iodine - 150mg daily
Selenium - 200mcg daily
Lthyrosine 500mg daily
Fish oil - 1000mg daily
Vitamin b complex - one b complex capsules daily
Lemon grass essential oils - 2-4drops
Natural suppliments, minerals, and food habits
Grape fruit juices, espresso coffee, high fiber diet, soy beans, soy, milk, salt, water,
Foods like eggs, meat, seafoods, vegetables, fruits, proteins, fibers, omega fatty acids
Multi vitamins - ferrous sulfate or calcium carbonate,
Phosphatebinders-aluminium hydroxide,
Calcium salts - carbonate, citrate, acetate.
Minerals-selenium

20. CONCLUSION

The findings of the study suggests that on antithyroid compounds equal in potency to herbal medicine and natural products has been isolated from the root, leaf, seed of that various plants, thyroid Natural treatment place more importance on improving life style and nutritional diet, providing spiritual support along with natural thyroid medications.

REFERENCES

1. AACE Thyroid Task Force. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism. Endocr Pract. 2002; 8(6): 457-469.
2. Vanderpump MP. The epidemiology of thyroid diseases. In: Braverman LE, Utiger RD, editors. The thyroid: a fundamental and clinical text. 9th edition. Philadelphia: Lippincott Williams and Wilkins; 2004; 398–406.
3. Devdhar M, Ousman YH and Burman KD. Hypothyroidism. Endocrinol Metab Clin North Am. 2007; 36: 595-615.
4. Andersson M, Takkouche B, Egli I, et al. Current global iodine status and progress over the last decade towards the elimination of iodine deficiency. Bull World Health Organ. 2005; 83: 518–525.
5. Shivaraj G, Prakash BD, Sonal V, et al. Thyroid function tests: a review. Eur Rev Med Pharmacol Sci. 2009; 13: 341-349.
6. Surks MI, Oritz E, Daniels GH, et al. Subclinical thyroid disease: scientific review and guidelines for diagnosis and management. JAMA, 2004; 291: 228-238.
7. Sebastiano V, Francesco MD, Alessandro V, Mattia V. Environmental iodine deficiency: a challenge to the evolution of terrestrial life? Thyroid. 2000; 10(8): 727-729.
8. Ristic-Medic D, Piskackova Z, Hooper L, et al. Methods of assessment of iodine status in humans: a systematic review. Am J Clin Nutr. 2009; 89: 2052S-2069S.
9. König F, Andersson M, Hotz K, Aeberli I, Zimmermann MB. Ten repeat collections for urinary iodine from spot samples or 24-hour samples are needed to reliably estimate individual iodine status in women. The Journal of Nutrition. 2011 Nov; 141(11): 2049-54. Epub 2011 Sep 14.
10. Triggiani V, Tafaro E, Giagulli VA, et al. Role of iodine, selenium and other micronutrients in thyroid function and disorders. Endocr Metab Immune Disord Drug Targets. 2009; (3): 277-94.
11. Trumbo P, Yates A, Schlicker S and Poos M. Dietary reference intakes: Vitamin A, Vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. J Am Diet Assoc. 2001; 101(3): 294-301.
12. Dietary Guidance 2011. National Agricultural Library, United States Department of Agriculture.http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=1&tax_subject=256. Accessed 6/5/11.
13. Köhrle J, Gärtner R. Selenium and thyroid. Best Pract Res Clin Endocrinol Metab. 2009;

23(6): 815-827.

14. Toulis KA, Anastasilakis AD, Tzellos TG, et al. Selenium supplementation in the treatment of Hashimoto's thyroiditis: a systematic review and a meta-analysis. Thyroid. 2010; 20: 1163-1173.
15. Zimmermann M, Adou P, Torresani T, et al. Persistence of goitre despite oral iodine supplementation in goitrous children with iron deficiency anemia in Coˆte d'Ivoire. Am J Clin Nutr. 2000; 71: 88–93.
16. Zimmermann MB. Interactions of Vitamin A and iodine deficiencies: effects on the pituitary-thyroid axis. Int J Vitam Nutr Res. 2007; 3: 236-240.
17. van Spronsen FJ, van Rijn M, Bekhof J. Phenylketonuria: tyrosine supplementation in phenylalaninerestricted diets. Am J Clin Nutr. 2001; 73: 153-157.
18. Neri DF, Wiegmann D, Stanny RR, et al. The effects of tyrosine on cognitive performance during extended wakefulness. Aviat Space Environ Med. 1995; 66: 313-319.
19. Iodine. Website of the Micronutrient Center, Linus Pauling Institute, Oregon State University.http://lpi.oregonstate.edu/infocenter/minerals/iodine/. Accessed 6/25/11.
20. Teas J, Pino S, Critchley A, et al. Variability of iodine content in common commercially available edible seaweeds. Thyroid. 2004; 14: 836-841.
21. Panda S, Kar A. Gugulu (Commiphora mukul) induces triiodothyronine production: possible involvement of lipid peroxidation. Life Sci. 1999; 65: PL 137-141.
22. Messina M, Redmond G. Effects of soy protein and soybean isoflavones on thyroid function in healthy adults and hypothyroid patients: a review of the relevant literature. Thyroid. 2006; 16(3): 249-258.
23. Clyde PW, Harari AE, Getka EJ, et al. Combined levothyroxine plus liothyronine compared with levothyroxine alone in primary hypothyroidism: a randomized controlled trial. JAMA. 2003; 290: 2952–2958.
24. Saravanan P, Visser TJ, Dayan CM. Psychological well-being correlates with free thyroxine but not free 3,5,3'-triiodothyronine levels in patients on thyroid hormone replacement. J Clin Endocrinol Metab. 2006; 91(9): 3389–3393.
25. Nygaard B, Jensen EW, Kvetny J, et al. Effect of combination therapy with thyroxine (T4) and 3,5,3'- triiodothyronin versus T4 monotherapy in patients with hypothyroidism, a double-blind, randomized cross-over study. Eur J Endocrinol. 2009; 161(6): 895-902.
26. Valizadeh M, Seyyed-Majidi MR, Hajibeigloo H, et al. Efficacy of combined levothyroxine and liothyronine as compared with levothyroxine monotherapy in primary hypothyroidism: a randomized controlled trial. Endocr Res. 2009; 34(3): 80-89.

27. Bunevicius R, Kazanavicius G, Zalinkevicius R, et al. Effects of thyroxine as compared with thyroxine plus triiodothyronine in patients with hypothyroidism. N Engl J Med, 1999; 340: 424–429.
28. Grozinsky-Glasberg S, Fraser A, Nahshoni E, et al. Thyroxine-triiodothyronine combination therapy versus thyroxine monotherapy for clinical hypothyroidism: meta-analysis of randomized controlled trials. J Clin Endocrinol Metab. 2006; 91: 2592–2599.
29. Gaby AR. Sub-laboratory hypothyroidism and the empirical use of Armour thyroid. Altern Med Rev. 2004; 9: 157-179.
30. Bolk N, Visser TJ, Nijman J, et al. Effects of evening vs morning levothyroxine intake: a randomized double-blind crossover trial. Arch Intern Med. 2010; 170(22): 1996-2003.
31. PEARLS FOR CLINICIANS study. Arch Intern Med. 2000; 160(4): 526-534.
32. Hypothyroidism. Bethesda, MD: National Endocrine and Metabolic Diseases Information Service, US Dept of Health and Human Services; 2012. NIH Publication No. 12-6180.
33. Golden SH, Robinson KA, Saldanha I, Anton B, Ladenson PW. Clinical review: prevalence and incidence of endocrine and metabolic disorders in the United States: a comprehensive review. J Clin Endocr Metab. 2009; 94(6): 1853-1878.
34. Graves' Disease. Bethesda, MD: National Endocrine and Metabolic Diseases Information Service, US Dept of Health and Human Services; 2008. NIH Publication No. 08-6217.
35. Aschebrook-Kilfoy B, Ward MH, Sabra MM, Devesa SS. Thyroid cancer incidence patterns in the United States by histologic type, 1992-2006. Thyroid. 2011; 21(2): 125-134.
36. Biondi B, Klein I. Hypothyroidism as a risk factor for cardiovascular disease. Endocrine. 2004; 24(1): 1-13.
37. Duntas LH, Brenta G. The effect of thyroid disorders on lipid levels and metabolism. Med Clin North Am. 2012; 96(2): 269-281.
38. Johnson JL. Diabetes control in thyroid disease. Diabetes Spectrum. 2006; 19(3): 148-153. Dietary supplement fact sheet: iodine. Office of Dietary Supplements website. http://ods.od.nih.gov/factsheets/Iodine-QuickFacts. Reviewed June 24, 2011. Accessed January 17, 2012.
39. Centers for Disease Control and Prevention. Second National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2012.

40. Dean S. Medical nutrition therapy for thyroid and related disorders. In: Mahan KL, EscottStump S, eds. Krause's Food, Nutrition, & Diet Therapy. 13th ed. Philadelphia, PA: Saunders; 2008; 711-724.
41. Tamer G, Arik S, Tamer I, Coksert D. Relative vitamin D insufficiency in Hashimoto's thyroiditis. Thyroid. 2011; 21(8): 891-896.
42. Jyotsna VP, Sahoo A, Ksh SA, Sreenivas V, Gupta N. Bone mineral density in patients of Graves disease pre- & post-treatment in a predominantly vitamin D deficient population. Indian J Med Res. 2012; 135(1): 36-41.
43. Rayman MP. Selenium and human health. Lancet. 2012; 379(9822): 1256-1268.
44. Toulis KA, Anastasilakis AD, Tzellos TG, Goulis DG, Kouvelas D. Selenium supplementation in the treatment of Hashimoto's thyroiditis: a systematic review and a meta- analysis. Thyroid. 2010; 2010: 1163-1173.
45. Sworczak K, Wisniewski P. The role of vitamins in the prevention and treatment of thyroid disorders. Endokrynol Pol. 2011; 62(4): 340-344.
46. Institute of Medicine Food and Nutrition Board. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington, DC: National Academies Press; 2001.
47. Rungapamestry V, Duncan AJ, Fuller Z, Ratcliffe B. Effect of cooking brassica vegetables on the subsequent hydrolysis and metabolic fate of glucosinolates. Proc Nutr Soc. 2007; 66(1): 69-81.
48. Messina M, Redmond G. Effects of soy protein and soybean isoflavones on thyroid function in healthy adults and hypothyroid patients: a review of the relevant literature. Thyroid. 2006; 16(3): 249-258.
49. Sathyapalan T, Manuchehri AM, Thatcher NJ, et al. The effect of soy phytoestrogen supplementation on thyroid status and cardiovascular risk markers in patients with subclinical hypothyroidism: a randomized, double-blind, crossover study. J Clin Endocrinol Metab. 2011; 96(5): 1442-1449.
50. Elnour A, Hambraeus L, Eltom M, Dramaix M, Bourdoux P. Endemic goiter with iodine sufficiency: a possible role for the consumption of pearl millet in the etiology of endemic goiter. Am J Clin Nutr. 2000; 71(1): 59-66.
51. Ch'ng CL, Jones MK, Kingham JG. Celiac disease and autoimmune thyroid disease. Clin Med Res. 2007; 5(3): 184-192.
52. Ventura A, Neri E, Ughi C, Leopaldi A, Citta A, Not T. Gluten-dependent diabetes-related and thyroid-related autoantibodies in patients with celiac disease. J Pediatr. 2000;

137(2): 263265.

53. Naiyer AJ, Shah J, Hernandez L, et al. Tissue transglutaminase antibodies in individuals with celiac disease bind to thyroid follicles and extracellular matrix and may contribute to thyroid dysfunction. Thyroid. 2008; 18(11): 1171-1178.
54. Jiskra J, Limanova Z, Vanickova Z, Kocna P. IgA and IgG antigliadin, IgA anti-tissue transglutaminase and antiendomysial antibodies in patients with autoimmune thyroid diseases and their relationship to thyroidal replacement therapy. Physiol Res. 2003; 52(1): 79-88.
55. Mazokopakis EE, Giannakopoulos TG, Starakis IK. Interaction between levothyroxine and calcium carbonate. Can Fam Physician. 2008; 54(1): 39.
56. Benvenga S, Bartolone L, Pappalardo MA, et al. Altered intestinal absorption of L-thyroxine caused by coffee. Thyroid. 2008; 18(3): 293-301.
57. John-Kalarickal J, Pearlman G, Carlson HE. New medications which decrease levothyroxine absorption. Thyroid. 2007; 17(8): 763-765.
58. Egert S, Rimbach G. Which sources of flavonoids: complex diets or dietary supplements? Adv Nutr. 2011; 2(1): 8-14.
59. Cutovic M, Konstantinovic L, Stankovic Z, Vesovic-Potic V. Structured exercise program improves functional capacity and delays relapse in euthyroid patients with Graves' disease. Disabil Rehabil. 2012; Epub ahead of print.