

Hypothyroidism

By Lita Lee, Ph.D.

Revised 7/2/06

The following information comes mainly from the pioneering research of Drs. Ray Peat and Broda Barnes. References are given where appropriate.

The thyroid gland is small, butterfly-shaped and located in the neck. This gland controls our metabolism, or the rate at which food is burned to form energy. Thyroid hormone and vitamin A are required to convert cholesterol into vital anti-aging steroids: pregnenolone, progesterone and DHEA. When thyroid secretion is inadequate, these steroids cannot be produced in adequate amounts. That's why low thyroid function has so many varied and broad-spectrum symptoms. It is easy to recognize severe hypothyroidism in the child (cretinism) and a person who has myxedema with its characteristic appearance - round face, double chin and fat, round belly plus abnormally bent knees and elbows. But, subclinical hypothyroidism is much more common and less easily recognized, because of the variety of symptoms.

Hypothyroidism and Radiation

For years I have observed that the majority of people who come to me have some form of thyroid dysfunction. Is this a coincidence, or am I seeing a common phenomenon? There are no accurate figures but I believe that mild to severe hypothyroidism is a modern epidemic. Why? Radiation is probably the greatest environmental cause of hypothyroidism and other thyroid problems, including tumors and thyroid cancer. Thousands of downwinders from Hanford and other nuclear plants, and accident victims such as 14 million people from Chernobyl, have had their thyroids damaged by radiation. To one degree or another, we are all downwinders, because radioactive fallout is a worldwide condition. There is no such thing as an unexposed control group. What varies is the severity of the health problems from mild to life threatening.

Many radiogenic symptoms stem from damage to the thyroid that comes from iodine 131. The thyroid gland and other organs are also sensitive to many radioactive elements present in radioactive fallout. Breathing air or eating food that has been contaminated with radiation can occur unrecognized by the victim. This causes far-reaching systemic effects, which includes damage to the thyroid gland. Epidemiological studies of downwinders show many of the symptoms of hypothyroidism described below, including chronic fatigue syndrome (CFS) and fibromyalgia. Peat describes fibromyalgia as a combination of edema, inflammation and low blood sugar, all symptoms of hypothyroidism.

I am not alone in believing that radiation is a major culprit in the hypothyroid epidemic. In his spring 1993 newsletter, Dr. John Gofman compares the medical signs and patient symptoms of hypothyroidism to the Chernobyl downwinders. They are virtually identical. Gofman cites a 1989 NRC report on the prevalence of hypothyroidism in patients treated with I-131. In patients receiving I-131 therapy from 3,000 to 50,000 rems, the prevalence of permanent hypothyroidism grew from 11.5% in the first year to 72.7% in the 11th year following treatment. Gofman disagrees with the NRC claim that there is a threshold dose below which no risk of hypothyroidism occurs. His research estimates that the risk of hypothyroidism starts at a dose as low as 10 rems of radioactive iodine, and at 3,000 rems one out of five victims will develop radiogenic hypothyroidism. Even these estimates are unrealistic in a world where people have been exposed to continuing low dose radiation from the moment life begins.

Dietary and Environmental Causes of Hypothyroidism

A low protein diet: Organic animal protein is essential for the production of the thyroid hormone and its conversion to the active form in the liver. Veganism leads to low thyroid function and low cholesterol which can lead to all of the major chronic degenerative diseases (take your pick): lung problems, diabetes, cancer, heart disease, gallbladder problems, depression, mental problems, and senility, etc. Women especially are vulnerable, because when they have low thyroid function, they become estrogen dominant and can't make progesterone. So, women have five to six times more osteoporosis, gallbladder disease, diabetes, etc., than men. The exception is men who eat commercial (high pesticide) plants, fruits and vegetables. All pesticides are estrogen mimics (xenoestrogens) and are carcinogenic. By organic animal protein, I mean eggs, dairy, cheese, yogurt, chicken, turkey, lamb and beef. You can't get organic fish but you can get good fish, such as halibut and shrimp.

Polyunsaturated Fats (PUFA or omega-3 and -6 oils): This includes all oils liquid at room temperature including: soybean, canola, safflower, corn, flaxseed, fish, Evening Primrose, and borage oils. The exception is extra virgin olive oil. The use of polyunsaturated vegetable oils, whether processed or not, interferes with thyroid function. *"The more unsaturated an oil is, the more strongly it interferes with thyroid secretion, the transport of thyroid hormone in the blood and the response of the tissue thyroid receptors."* (Peat, *Townsend Newsletter*, April 1994).

All forms of estrogen: ALL estrogenic substances, whether natural, synthetic, herbal or environmental are extremely toxic and cause the diseases of aging – heart disease, cancer, gallbladder disease, blood clots, blood pressure abnormalities, seizures, age spots, arthritis, all female problems including menopause, brain cell death and senility. Natural (not synthetic) progesterone prevents these diseases. Estrogen prevents your thyroid from secreting the thyroid hormone and also inhibits the conversion of T4 (the inactive form of the thyroid hormone) to T3 (the active form of the thyroid hormone). You are taking 20 times the amount of estrogen that your body made when you were at the peak of your fertility. If you choose to stop taking this toxic drug, the main complaint that most women have is hot flashes. These will gradually go away with thyroid, progesterone and pregnenolone therapy.

Soy products: Soy products contain three potent estrogenic substances (plant or phytoestrogens), which inhibit thyroid function and the conversion of T4, the inactive form of the thyroid hormone to T3, the active form of the thyroid hormone.

Pesticides in commercial foods: Pesticides are estrogen mimics and inhibit thyroid function. In addition, commercial foods containing pesticides have from 200-400% LESS nutrition than the organic equivalents. So, although organic foods are more expensive, you will get much more for your money and will be satisfied with less food.

Fluoride: common in water, reconstituted beverages, foods and toothpaste causes severe hypothyroidism, poisons over 100 enzymes, and causes increased risk to seizures, bone disease, premature aging and cancer (Waldbott).

Synthetic and genetically engineered hormones: (estrogen and others) in meat, dairy products, poultry and eggs and in birth control pills block the release of thyroid hormone from the gland.

Excess iodine is a powerful thyroid inhibitor. Most Americans get too much iodine because it is used as a dough conditioner as iodates and in commercial iodized salt. (Dr. Ray Peat Ph.D., *Nutrition for Women*, page 17).

Certain isolated nutrients found in vitamins, such as beta-carotene and PABA (para amino benzoic acid) are thyroid inhibitors.

Mercury, present in silver amalgam fillings and as an environmental toxin, inhibits the conversion of T4 to T3. In fact, most toxins are thyroid inhibitors.

Endurance exercise also depresses thyroid function. That's why endurance athletes have a slow pulse. According to Peat, exercise accelerates the breakdown of thyroid hormones, resulting in a protective slowing of metabolism. "*The slow heart beat of runners is largely the result of this adaptive hypothyroidism.*"

How to find out if you have a sluggish thyroid

There is no accurate medical test for thyroid function. A person may have normal levels of thyroxin but not be converting it adequately to the active form of the thyroid hormone (triiodothyronine or liothyronine). High cholesterol is practically diagnostic of hypothyroidism. Why? Because thyroid hormone controls the conversion of cholesterol to important anti-aging hormones and to bile salts. However, many hypothyroid people have low cholesterol from a suppressed immune system or from eating a low protein (vegan) diet.

The late Dr. Broda Barnes introduced the basal temperature test as an easy way to determine adequate thyroid function. It's important to do an oral temperature test. The oral temperature is measured with an oral digital thermometer after arising. Women should do this during their menses to insure missing the rise of temperature during ovulation. The morning oral temperature *after arising* should be 98.0 degrees F. It should then rise to 98.6-99 degrees F during daylight hours and the resting daytime pulse should be around 85 beats per minute. The healthy resting pulse should be about 85 beats per minute. The national average is around 72. If your pulse is less than 80, you may have an underactive thyroid (however a hypothyroid person with high adrenalin can have a pulse of as high as 150). Babies have a pulse greater than 100 until around the age of eight years when the pulse slows down to around 85. Peat says that the idea of a slow pulse being healthy is folklore. Thyroid needs increase during the cold, dark winters and decrease during the warm summer days when there is more sunlight.

Common symptoms of hypothyroid function

Here is a partial list: chronic fatigue; insomnia; fibromyalgia; goiter; high or low blood pressure; underweight or overweight; depression; diagnosed with mental illness; attention deficit hyperactivity disorder (ADHD); allergies; immune system problems (frequent colds and flu, asthma, bronchitis, etc.); all female problems (PMS, cyclic migraines, cyclic seizures (at ovulation and menses), mood swings, fibrocystic breasts, ovarian cysts, uterine fibroids, infertility, miscarriage around the 10th week, excessive, scanty or irregular menses, etc.); colon problems; skin problems; hypoglycemia and all conditions related to aging (heart problems, gallbladder disease, cancer and tumors, diabetes, senility, etc.). Here are some details on these problems.

Increased Cholesterol

Cholesterol may rise because there is inadequate thyroid hormone to convert it to bile salts and the anti-aging hormones, pregnenolone, progesterone and DHEA. Many of the far-reaching effects of hypothyroid function result from a deficiency in these substances because of their importance in preventing tumors, cancer, heart disease, obesity, memory loss and other conditions associated with aging. However there are conditions that can lead to inadequate cholesterol production, such as a low animal protein diet and other dietary and immune system factors.

Blood Sugar Problems; Increased Adrenalin and Cortisol

Glucose is required to convert thyroxin (T4) to its active form, triiodothyronine or liothyronine (T3). This occurs mainly in the liver, if glucose is adequate. Why? Glucose activates sulfhydryl enzymes that convert T4 to T3. What happens when T3 is not produced, whatever the cause - stress, radiation, environmental toxins, excess dietary estrogen or liver problems? When T3 decreases, the respiratory or mitochondrial enzymes do not work. T3 is essential for activating the electron transport chain down to the production of oxygen. When T3 is inadequate, sugar (glucose) is burned inefficiently to lactic acid instead of all the way to carbon dioxide. So, the body gets less energy from the same amount of glucose. When the liver runs out of stored sugar (glycogen), it stops converting T4 to T3.

The overall effect of this is low blood sugar, leading to increased adrenalin to compensate for the deficiency of energy, glucose and oxygen. Low thyroid patients excrete 30-40 times the normal amounts of adrenalin metabolites. At first, adrenalin attempts to mobilize glycogen and stored fat. Then progesterone is converted to cortisol in the adrenal cortex by a complex pathway involving a pituitary hormone (ACTH), which is released in response to adrenalin. Cortisol increases blood sugar via the catabolism of protein. Increased cortisol can decrease adrenalin and lead to a low pulse, common in hypothyroid people. But, if the adrenal cortex becomes exhausted and cannot produce enough cortisol, adrenalin will rise. Adrenalin-dominant people may have a high pulse around 120-150 but are still hypothyroid. In either case, proper thyroid therapy will normalize the resting pulse to the optimum, 85 beats per minute. The production of cortisol is a life saving response to stress but in the hypothyroid person, it occurs abnormally in an attempt to keep the blood sugar up. Cortisol, like estrogen, inhibits the thyroid, creating a vicious cycle that can only be broken by proper hormone balancing, such as thyroid therapy, and by opposing cortisone and/or estrogen with pregnenolone and progesterone, respectively. In addition, excess cortisol can lead to hot flushes or night sweats, diabetes, bone loss and glaucoma.

Heart Disease

Adrenalin and its synthetic drug mimics, such as the beta agonist inhalers used in asthma are toxic when used or produced continuously in response to the stress of hypothyroidism and endurance exercise. Excess adrenalin is cardiotoxic because it damages heart mitochondria (Voino-Yasenetskaya; Meerson). Peat suggests that this is due to abnormally rapid mobilization and oxidation of unsaturated fatty acids leading to peroxidation, aggravated by inadequate antioxidant protection. Barnes has many years of research on the cardioprotective effects of thyroid therapy on his diabetic patients, who normally have an increased risk to heart disease. This led him to conclude that the cardiovascular complications of diabetes are due to low thyroid function, not insulin.

Cancer

Dr. Barnes also concluded that cancer risk increases in hypothyroid patients, both male and female. This is directly related to increased production of estrogen and decreased production of the primary anti-aging steroids from LDL cholesterol: pregnenolone and its end products, progesterone and DHEA, a thyroid-dependent reaction.

Blood Pressure Problems, Poor Circulation, Edema

The hypothyroid person can have high or low blood pressure, depending on whether adrenalin or cortisol are in excess. High blood pressure can result from excess adrenalin. Low blood pressure can come from excess cortisol production. Thyroid hormone will increase circulation and cause a transient increase in blood pressure, but its long-term effect is to improve circulation, lower blood pressure to normal and increase blood glucose to normal.

The immediate effect of thyroid hormone is due to a combination of the effects of thyroid hormone in the presence of excess adrenalin. In the presence of thyroid, tissue response to adrenalin is increased. This may result in an initial increase in pulse. This is why you should slowly increase the dose, while at the same time monitor your oral temperature and resting pulse.

Hypothyroidism can cause hypoxia (low tissue oxygen) and edema. Patients often complain of cold hands or feet, that their hands and feet “go to sleep” easily, and of poor circulation. Edema is involved in carpal tunnel syndrome, in glaucoma, in which the jelly inside the eye swells and in Grave’s disease in which the muscles behind the eyes swell. All of these problems can be relieved by pregnenolone or progesterone and proper thyroid therapy to correct the imbalance. Specifically, Peat observed a reduction in ocular pressure following a dose of progesterone and the return to normal of the budging eyes in a Grave’s patient within 24 hours following pregnenolone administration.

Colon Problems: Constipation, Low Intestinal Tone

Constipation is common among hypothyroid people, who have low intestinal tone. Thyroid therapy will increase intestinal tone until the colon unloads the excess feces. Until this happens, the patient may wake up with a stuffy nose and sometimes a headache. A hypothyroid person can get a similar response just by eating raw carrots, which stimulate the intestines, according to Dr. Peat.

Depression and Emotional Problems

Depression is a classic symptom of hypothyroidism. In women, this can lead to severe post-partum depression following childbirth. Depression and other mental and emotional symptoms are sometimes present without any other apparent physical problems. Dr. Barnes described a 30-year-old housewife and mother of three children whose post-partum depression was so severe following each birth that she was given electroshock therapy, anti-depressant drugs and was institutionalized on two occasions. When she first came to Barnes, she was “*seriously depressed, apathetic, withdrawn, unable to sleep, unable to care for her children.*” After six weeks on thyroid therapy, she showed some improvement. Within six months, she was entirely well.

Energy-related problems: Insomnia, Hyperactivity and Fatigue

How can a hypothyroid person be tired, hyper and have insomnia all at the same time? These symptoms do co-exist in many hypothyroid people and may be remediated with thyroid therapy. Dr. Alan Gaby

reported a study of 49 individuals who were diagnosed with hypothyroidism. Among these, 61% were diagnosed with attention deficit-hyperactivity disorder.

In the April 1994 *Townsend Letter for Doctors*, Peat discusses insomnia and hyperactivity among hypothyroid people. He says that the use of stimulants such as Ritalin (methylphenidate), ephedra and ma huang to calm down hyperactive children can be explained as follows. *“The frontal lobes of the brain, the most highly evolved part, give us the ability to plan and to understand complex things that require prolonged attention. Without this higher part of the brain, which has a very high energy requirement, people and animals become hyperactive and unable to concentrate.”*

When thyroid hormone is deficient, the nerves require abnormal stimulants to function or the body produces excess adrenalin to keep it going. *“The result is that we get tired and tense at the same time.”* Instead of using Ritalin, coffee or other stimulants to raise the energy level of the brain, it seems much more natural to correct the cause of the energy deficit - inadequate thyroid hormone. In the last 20 years, Peat reports almost complete relief of insomnia in hypothyroid patients when their thyroid function was corrected, sometimes with dietary changes alone but usually with supplemental thyroid.

When energy production is slowed due to lack of thyroid hormone, muscles tend to tire or cramp easily and to swell after exercise. Like the brain, all muscles need to restore their energy in order to relax. Whether it's leg cramps or brain fatigue, increasing the rate of energy production, makes relaxation (and sleep) possible.

Weight Gain OR Loss

Weight gain or inability to lose weight are common hypothyroid symptoms. But some hypothyroid people are underweight, so weight alone, is not a determining factor. In fact, most of the “weight” in the hypothyroid person is water, not fat. Because thyroid can help an anorexic, or sick person gain weight, Peat calls thyroid hormone an anti-catabolic hormone, one that opposes catabolism to normalize its balance with anabolism.

Skin/Hair Problems

Many skin problems are associated with or aggravated by inadequate thyroid function. The most common symptom is dry skin. Many *but not all* people who suffer from acne, eczema or psoriasis are relieved on thyroid therapy. Hair loss is common among hypothyroid people. This is especially common in women after childbearing and in women who diet frequently.

Headaches

Headaches can have many causes. Here, we emphasize the thyroid-headache connection. This includes not only migraines but also the more common tension headaches, which increase during times of stress and sleep deprivation. Hypothyroid women may get cyclic migraines at ovulation and menses due to excess estrogen.

Immune-Deficiency and Frequent Infections

Adequate thyroid hormone is required for proper immune system function. Anemia (a low white blood count) and resulting frequent infections are common in people who have low thyroid function. Symptoms of serious conditions, such as multiple sclerosis, mitral valve prolapse, and arthritis - which have other causes - are sometimes remediated with thyroid therapy.

Multiple Sclerosis: Knowledge of heavy metal poisoning, such as mercury and cadmium in MS victims is probably more widespread than knowledge of the relationship between MS and low thyroid function. Peat explains this as follows. Cells called oligodendrocytes are responsible for myelinating nerve fibers and are steroid-forming cells. Specifically, they produce pregnenolone. In MS, these oligodendrocytes appear to stop functioning. The clustering of oligodendrocytes around deteriorating nerve cells may be an attempt to provide pregnenolone to the injured cells, suggests Peat. Both pregnenolone and its end-product hormone, progesterone protect against nerve damage by other substances such as the excitotoxic amino acids glutamate, aspartate and NutraSweet.

Hypothyroidism may go unrecognized in patients with MS symptoms who aren't fat or lethargic or severely disabled. According to Peat, thyroid therapy caused the MS symptoms to disappear in MS patients who had no other obvious problems, such as heavy metal poisoning. Peat tells the story of one of these patients who reported to her doctor that she felt perfectly healthy since taking thyroid. Her doctor told her to stop taking it, because MS patients need lots of rest and she would not get it living a normal active life!

Recurring infections: Hypothyroidism causes immune suppression and anemia. Therefore, it is not surprising that hypothyroid people are subject to recurrent infections. Barnes cites the following infections among hypothyroid patients: frequent colds, respiratory infections including bronchitis and pneumonia, chronic sore throats, sinusitis, recurrent otitis media or middle ear infection, tonsillitis, and recurrent bladder infections. In his day, tuberculosis and rheumatic fever were common and caused many premature deaths. Chronic fatigue syndrome, with its long list of viruses and other infections, is causally associated with low thyroid function.

Mitral Valve Prolapse: This is common in chronic hypothyroidism. Autopsy reveals the valve thickened into a jelly-like mass (Peat, *Generative Energy*, p. 110). Thyroid-deficient women with PMS have a premenstrual mitral valve heart murmur, which is not present at other times of the month. Thyroid therapy relieves both PMS and the mitral valve prolapse. *"The jelly can be formed and removed fairly quickly."*

Arthritis and joint pains: Joint pains, often diagnosed as arthritis, may be caused by a sluggish thyroid. In thyroid deficient children, aching legs or calves, more noticeable after exercises, are often passed off as "growing pains." This is a temporary exercise-induced hypothyroid edema of the leg muscles. In more severe cases, the cartilage in the joints swells, causing a characteristic knock-kneed appearance.

Female Problems

Female problems including infertility, miscarriage, fibrocystic breast disease, ovarian fibroids, cystic ovaries, endometriosis, PMS and menopausal symptoms are usually caused or aggravated by hypothyroidism coupled with estrogen dominance (estrogen unopposed by progesterone). This can occur even with a normal estrogen level if progesterone is low, or with normal progesterone if the estrogen is high. What is the thyroid-estrogen connection? Estrogen inhibits thyroid secretion. Progesterone stimulates it. Progesterone is made in the body from cholesterol IF there is adequate thyroid hormone and other nutrients including vitamin A and certain enzymes. So, a thyroid deficiency, whether caused by estrogen dominance (and its thyroid inhibiting effect) OR a sluggish thyroid gland itself, has far reaching consequences.

Nutritional Program to Support Normal Thyroid Function

Food Enzyme Support

Because the endocrine glands are driven by *digested* food, my first effort is to correct digestive problems with food enzymes and to emphasize whole organic foods. When the organs are nourished with digested whole foods, many problems are ameliorated. Patients may find that they need lower doses of whatever drugs they are taking, including their thyroid medication. This is simply due to increased performance following organ nourishment.

Thyroid Support

For patients who need thyroid support, I prefer whole food derivatives - whole bovine or porcine glandulars such. Why? Because these contain the protein precursors to both T4 (thyroxine) and T3 (triiodothyronine). Synthroid is the most ineffective form of thyroid because it contains only T4. A patient with liver problems cannot convert it to the active form, T3. This is especially prevalent in estrogen-dominant women.

Progesterone as Thyroid Support

Progesterone stimulates the thyroid to secrete its hormone. It also opposes the toxic effects of estrogen and cortisol and is a powerful immune system stimulant. I use progesterone in hypothyroid-estrogen-dominant women with PMS symptoms and to nutritionally support women with other female problems including breast pathology or uterine fibroids. In men who have thyroid problems, pregnenolone is preferred to progesterone because progesterone inhibits testosterone and young men, in particular, may feel reduced libido and reduced growth of their beards.

Pregnenolone to Oppose Cortisol

Pregnenolone opposes cortisol which can rise in hypothyroid people. Excess cortisol can lead to hot flashes (in both men and women), diabetes and other health problems.

Thyroid-Stimulating Foods

A diet high in organic animal protein: Adequate animal protein is required for the production of the thyroid hormone and for the conversion of T4 to T3. This means eating at least 4 oz (25-30 grams) of organic animal protein three times daily. What kind? Any kind, organic, of course: meat, lamb, fish, poultry and dairy. Take your pick.

Fruits and fruit juices: Fruits and fruit juices help modulate blood sugar and calm down the adrenal glands. If you add about 1/4th tsp of sea salt to your fruit juice, this will raise your blood sugar to normal and calm you down. Also, fruit juice can stimulate increased production of T3 (active thyroid) from T4 (inactive). Finally, fruit juice provides magnesium, which works with the thyroid to moderate stress (Peat). As well, fruits/fruit juices are high in salicylates which are anti-inflammatory.

Carrots: Here is Peat's carrot salad recipe (*Generative Energy*, page 117): grated carrots, vinegar, coconut oil and salt. Each has a specific function. Fatty acids in the coconut oil are thyroid stimulating as described below. Carrot fiber tones the bowel and binds toxins.

Sea Salt: Salt is a natural diuretic, mobilizes glucose, which lowers adrenalin and thus prevents adrenalin-induced hypertension and hardening of the arteries. Stabilizing blood sugar helps to convert T4

to T3. Use sea salt (without added iodine) that contains 48 minerals, instead of commercial table salt, which contains only sodium chloride.

Coconut oil: This is one of the healthiest saturated fats other than butter and extra virgin olive oil. It contains the same oils that are present in mother's milk. It has several thyroid-promoting effects. First, it contains butyric acid, which helps thyroid hormone move into the brain by increasing T3 uptake by glial cells. Secondly, it opposes anti-thyroid unsaturated oils. Finally, it contains short and medium chain fatty acids, such as lauric acid, which stimulate the immune system, help modulate blood sugar, are anti-allergic, and protect mitochondria against stress injuries.

Great Lakes Gelatin (cooked collagen): This is the only protein powder I recommend. It contains pro-thyroid amino acids which balance the anti-thyroid amino acids in muscle meats. One tbsp of gelatin is six grams of protein. You can add it to fruit juices, soups, or make Jello salads from it.

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References

- Gaby, Alan R., M.D., "Thyroid Hormone and Attention Deficit-Hyperactivity Disorder," *Townsend Newsletter for Doctors*, April 1994, p. 280.
- Gofman, John, M.D., "Radio-Iodine: From Hanford to Chernobyl...And Beyond?" *Committee for Nuclear Responsibility Newsletter*, 1994, P.O.B. 421993, San Francisco, CA 94142.
- Peat, Ray, Ph.D., *Ray Peat's Newsletters: Thyroid: Misconceptions; Multiple Sclerosis and Other Hormone-Related Brain Syndromes;*
- Peat, Ray, Ph.D., *Nutrition for Women*, P.O. Box 5764, Eugene, OR 97405; Phone: (503) 345-9855.
- Peat, Ray, Ph.D., *Generative Energy*, 1993, *ibid.*
- Peat, Ray, "Progesterone in Orthomolecular Medicine", 1978, *ibid.*
- Peat, Ray, Ph.D., *Mind and Tissue*, 1994 edition, *ibid.*
- Peat, Ray, "The Progesterone Deception," *Townsend Letter for Doctors*, Nov. 1987.

- Peat, Ray, "Solving Some of the Problems of Aging", *Townsend Letter for Doctors*, Jan. 1991.
- Peat, Ray, Ph.D., "Insomnia and Hyperactivity," *Townsend Newsletter for Doctors*, April 1994, p. 385.
- Meerson, Felix, Z., et al., ***Adaptive Protection of the Heart; Protection Against Stress and Ischemic Damage***, translated from Russian by Alexander V. Galkin, Ph.D., Moscow, U.S.S.R., CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431, 1991.
- Voino-Yasenetskaya, T.A., et al., "Prevention of Catecholamine-Induced Lesion of the Endothelium of the Rabbit Aorta by Alpha- and Beta Adrenoreceptor Antagonists and Lithium Hydroxybutyrate", *Bull. of Experimental Biol. and Med.*, p. 549 (1987).
- Waldbott, George L., M.D., ***Fluoridation: The Great Dilemma***, Coronado Press, Inc., Lawrence, KS, 1978.