Raymond Peat, Ph.D.

THE THYROID

1996 Gary Null radio

(transcribed by unknown)

NULL: Nice to have you with us, Dr. Peat.

PEAT: Thanks. Could I comment on intermittent claudication and how it relates to thyroid?

NULL: Sure.

PEAT: It's very common for pre-puberty people to have leg pains that they call growing pains, and those people are typically a little bit low thyroid, and the textbooks used to show little kids with horribly swollen calf muscles that looked like they were muscle bound; but it was the accumulation of muco-polysaccharides swelling the muscle up causing great pain, cramping and so on, and in old people who are hypothyroid, something very similar happens, but it includes degeneration of the blood vessels to some extent, and you mentioned the chelation plus magnesium.

When you take thyroid, it energizes your cells to make ATP, and it happens that ATP binds magnesium, so you don't really take up magnesium into the cell very efficiently unless you have adequate thyroid. And when you are low in thyroid, you tend to lose magnesium during stress, and chronically that leads to a crampy, inefficient condition where you waste oxygen, producing your energy, but you can't retain it because of the lack of magnesium.

So in many situations, magnesium imitates thyroid function, but the two together really are simply energizing the tissue; and you can go from crampy legs, or many old people get "jumpy legs" -- a funny sensation that makes their legs kick when they try to go to sleep -- you can go from that hyperactivity of the legs to many other conditions including heart rhythm problems, insomnia, muscle pains in general, many states that are considered degenerative diseases, but are simply low thyroid/low magnesium states that prevent efficient energy production.

NULL: Good. Dr. Peat, why don't we begin by you telling us about how we have a correlation between an underactive or a low thyroid function and the aging process, and then maybe include information, in lay language, about insomnia and arthritis, and cholesterol, all these things that we don't assume are associated with the thyroid gland, but indeed are?

PEAT: Okay. When a person is under stress, the thyroid adaptively goes down. It's like a hibernation process. That's one adaptation that works if an animal is starving, for example, in the winter. If its metabolism slows down, its heart rate slows, and its body temperature drops, it can last through the winter without eating up its fat too fast. Or if it's in a famine situation or a migration, if the thyroid slows down during starvation or prolonged activity as in migrating, you can go farther on a given amount of stored energy.

When people go on extreme diets trying to lose weight, they lose maybe a pound or

so the first day, but then they stop losing weight if they're eating much less than 1,000 Calories. Or on a total fast, they will lose nothing but muscle after the first day. That's because after about 12 to 24 hours, your liver has depleted its sugar stores, and at that point it starts turning your muscles and other tissues to sugar, and that would destroy your body very quickly.
So the thyroid adapts down under stress, and so the worse the stress is, or the more prolonged, the lower your thyroid gets. And that means that with aging, you tend to have accumulated so many stresses that your thyroid gets chronically depressed, and unless you give it the right signals to bring it back, it just stays there and gets lower and lower.

When your thyroid is low, you don't store sugar efficiently, and so you are very efficient about burning up your body slowly, but you aren't efficient at repairing it. And all you're doing is decaying at a slower rate when your thyroid is down. So what you want to do is stop the decay process and begin the repair process.

People have looked at patients in hospitals, and they have found that the ones with the same diseases but with a low body temperature are the ones who are less likely to survive and go home, and it's because the low thyroid, which is an adaptation to many stresses and sicknesses -- at a certain point, the low thyroid stops being protective and starts interfering with the healing process.

And when you have been in that low thyroid state too long, you are living on adrenaline and cortisone, which are destroying all of your essential tissues. I've seen many low thyroid people who, in a day, produced 30 or 40 times more adrenaline than normal; and adrenaline tends to lead immediately to cortisone production, depending on how efficient your adrenals are.

And this high adrenaline state creates a terrible amount of confusion among doctors and patients both, because as an adaptation, it makes people feel like they're on speed sometimes, to have this adaptive, extreme overproduction of adrenaline. And at night, it's normal for adrenaline and cortisone to rise, even in young people, because it's a sort of a fasting state, and they're not eating, and so they maintain these sugar producing hormones during the night.

But in old age, these are higher, in general, because of the low thyroid. So that if your thyroid is low, or you're old and have low thyroid (that's a more or less natural thing), nighttime, with the rising adrenaline and cortisone, becomes more and more stressful, and insomnia becomes more and more common. It's very usual for people in their 70's and 80's to wake up after 5 or 6 hours of sleep and just get up early because they know they aren't going to be able to get back to sleep.

But this also happens in very young people who have low thyroid. And when it gets to an extreme, it can lead to a hyperactive state, with a loss of attention or extreme irritability and depression, and a lot of strange symptoms that, if you can get your cortisone and adrenaline under control by normalizing your thyroid and blood sugar, these strange symptoms of high tension just disappear.

One of the common stereotypes about low thyroid people is that they are just lethargic and sluggish. But a very large group of low thyroid people become hyperactive because of this very high adrenaline compensating for the low blood sugar.

Broda Barnes, who was one of the best thyroid researchers in the '30s and '40s wrote a book called "Hypoglycemia: It's Your Liver, not Your Mind," because he found that almost all hypoglycemics were low thyroid, and that the liver simply wasn't able to store enough glycogen to keep their blood sugar steady.

The high cholesterol that develops in most people as they age is another thing that, in the '30s and '40s, many researchers recognized that high cholesterol was nothing but an indicator of low thyroid, the same way low blood sugar was mostly an indicator of low thyroid. There were published studies in the middle 1930's which showed that when you took out someone's thyroid gland, immediately the cholesterol went up, and when you gave them a thyroid supplement, immediately the cholesterol goes down.

That's because thyroid is needed to produce products that the cholesterol turns into, such as bile acids, progesterone and pregnenolone, which are youth associated hormones. Vitamin A and cholesterol are used up by thyroid in producing these essential hormones and bile materials.

I've seen people, just like the published studies 60 years ago, I've seen people consistently -- in one case, the cholesterol went down almost 100 points a day with very frequent big doses of quick acting thyroid. But usually you can see it go down 50 points a week with very careful thyroid supplementation.

The things that are happening to the national diet are mostly creating worse problems for cholesterol metabolism and thyroid function. A couple weeks ago in the news, there was a story about hypothyroidism in China. At least 100,000,000 Chinese are hypothyroid, and 25,000,000 are retarded and, actually, have cretinism from congenital low thyroid.

It's been known most of this century that in areas where they eat beans as a staple of the diet, such as in China, many types of beans, including soybeans, but in the Andes region, just ordinary beans are the major cause of hypothyroidism, because of various anti-thyroid factors in beans, lentils, and certain nuts -- peanuts, for example.

In eastern Europe, the cabbage and turnip staple diets were major causes of cretinism and chronic goiter and myxedema. Myxedema is the name for one type of hypothyroidism that develops in adults, in which mucousy material forms in the tissues, makes the tongue thicken, the skin gets coarse and inelastic -- but variations of myxedema can cause a lot of strange diseases that are put down to genetic causes more often than hypothyroidism, but you can cure them, in sometimes a week or two, with the right dose of thyroid.

For example, certain types of mitral valve prolapses are just from an accumulation of a mucous-like material in the valve, making it thick and inefficient. Glaucoma in low thyroid involves a swelling and overproduction and increased thickness of the fluids in the eyeball. Some types of Graves' disease, which most doctors think of as hyperthyroidism -- but hypothyroidism, which causes the pituitary to become overactive -- hypothyroidism very predictably tends to cause bulging eyes, because the thyroid stimulating hormone from the pituitary causes a mucousy material to form in the area behind the eyeball, causing a protrusion of the eyeball.

The mucousy materials that are overproduced can also cause blood vessel inefficiency and rigidity, and contributes to things like varicose veins. When this material gets in the joints, it causes cartilage deformities. The old textbooks used to show teenagers with deformed joints that caused the same deviation of the bones -- at the elbow joint especially, and the knee joint especially, with knock knees for example -- but in old people you see the fingers deviating to one side, because the cartilage is getting deformed.

The right balance of thyroid and the youth associated hormones -- progesterone and pregnenolone, and to some extent, DHEA -- will rebalance the production of these mucous-like molecules -- the glycoproteins and mucopolysaccharides, they're called -- and in just a week or two, you can often correct the deformity in a permanent way, so that the joint functions without pain or distortion.

All of the chronic diseases, to the extent that they involve this false adaptation, in which the thyroid tries to put you into a sort of hibernation state -- all of the chronic diseases tend to benefit from the right supplement of these youth associated hormones. And the history of medical thyroid treatment is necessary before a person can understand what the doctor is doing with the tests. Typically, a doctor will diagnose normal thyroid function on the basis of a test of the thyroxine in the blood, and sometimes backs that up with a normal range TSH, or thyroid stimulating hormone.

The TSH usually is somewhere in the range between .5 and 6 units, and a person will be called normal when it's anywhere in that range. But when it's above 1 unit, in other words when it's just anywhere above the lowest normal range, the TSH is already causing excess production of the mucopolysaccharides that tend to load up the various tissues. But still a person will be considered normal in terms of the blood thyroid tests, because the thyroxine is defined as the thyroid hormone itself on the basis of some studies that were done 50 years ago.

The thyroxine is said to be normal in a range of, for example, from 4 to 12 units. If you took any other biological indicator and gave it such a wide range -- 4 to 12 in the case of thyroxine, or .5 to 6.0 in the case of TSH -- you would have, for example, blood sugar ranging from the level at which it causes convulsions and death up into the low diabetic range, and you would call all of those normal. Or cholesterol ranging from the range of the low cholesterol that is associated with cancer and strokes, up into the very high, like 3-or-4-hundred milligrams of cholesterol. So it's a very strange thing that thyroid is given such a definition that makes almost everything get called normal.

What happened was in the 1940's, 40% of the American population was known to benefit from thyroid supplement, and they had a low oxygen consumption. But a drug company came out with a blood test that was called the protein-bound iodine test, and it seemed like a rational scientific thing to say that if a person had plenty of protein-bound iodine in their blood, their thyroid would be okay, because people knew that an iodine deficiency caused hypothyroidism at that time.

So the blood test found that 95% of Americans had plenty of protein-bound iodine. And when I was in school, all of my fat friends with the traditional symptoms of low thyroid had been taught to say, "No, I don't have a glandular problem. I'm just lazy

and gluttonous." That was passed through the whole culture in the late 1940's and early '50s. Then in the '60s it turned out that the protein-bound iodine test had essentially no relationship to thyroid function, and now it's a standard textbook point that high doses of iodine can be used to suppress a highly active thyroid.

When it turned out that the protein-bound iodine test was proven invalid -- it goes up when your estrogen is high, for example, knocking out your thyroid function -- new tests were brought to the market actually measuring thyroxine, and what happened was they kept the standard idea that only 5% of the population was hypothyroid, even though the test used to establish that concept was proven completely meaningless. So what we have kept is this doctrine that 95% of the population don't need thyroid, and no matter what kind of test we use, we have to stretch the test to fit the doctrine that only 5% can get thyroid.

NULL: Dr. Peat, we're coming up to our halfway mark in this segment of our program...when we return, let's get into some of the other conditions a low thyroid can affect -- our cholesterol level, arthritis-like symptoms, has melatonin been found to inhibit progesterone and stimulate estradol secretion, and how do we help the thyroid?

...in this segment of our program, we're going to be continuing with a discussion in part about our thyroid. And I've invited a very articulate -- he's soft-spoken, you can see the professor in him, and the educator, because he's being very methodical; he's giving us the larger context, he's giving us the cause and effect, and so we're learning an enormous amount about conditions that we didn't know were related to the thyroid gland in all ages and all body types. So let's continue with Dr. Ray Peat...

PEAT: Okay, you mentioned the hormones estrogen and how it relates to melatonin. With increasing age, people have made a big thing of the fact that melatonin, which peaks about 3AM in everyone, that this peak is a little bit smaller in old age. But it happens that...with aging, as the thyroid decreases, the melatonin decreases, because when thyroid is active, your melatonin comes up as an antioxidant defense against that the high metabolic rate that thyroid can stimulate. So when your thyroid is low, the melatonin is low, when your thyroid is high, the melatonin is high, in a logical adaptation -- because it is an antioxidant.

But the function of melatonin all by itself, when it isn't surrounded by the appropriate other conditions, melatonin, in studies done in pig tissue, by a man named (Sirotkin?), pigs are relatively close to humans in having daytime habits, nighttime sleep and so on, which is very important for melatonin because it's a nighttime dominant hormone -- in pigs, he found that melatonin suppresses progesterone and raises estrogen, and this happens to be the same thing that low thyroid does.

So if the melatonin rises in proportion to your thyroid, it doesn't matter that it is having these pro-estrogen, anti-progesterone effects, because the thyroid is doing exactly the opposite to those hormones and is taking care of the situation, because thyroid gets rid of the excess estrogen while...being totally responsible for producing progesterone. But if you take melatonin out of context, as he did in the pig study, you're going to get an exactly anti-thyroid effect, deranging those hormones in the direction of stress and aging.

Some of the current publicity that is used to promote the fact that melatonin is used to make you go to sleep, it happens to be also a thing that goes up during hibernation, and its function is to lower the body temperature, and remember the hospitalized patients -- the ones who had the lowest temperatures were the least likely to survive, because as the thyroid goes down and your body temperature falls, you lose a lot of your immune functions and tissue repair capacity. So lowering your body temperature does make you hibernate and it does make you sleep, but you don't want to use something out of context to force that.

The studies that have been used to advocate melatonin's possibly anti-aging effect were done on mice and rats, and it turns out that they are very opposite to human beings and pigs, because they work at night in general and sleep in the daytime, and so melatonin for them has exactly the opposite meaning that it does for people and pigs. And for example, in humans and rats, melatonin raises prolactin, but in humans, prolactin knocks out progesterone production and causes infertility and stress and osteoperosis for example.

But in rats, it happens, and mice, it happens...prolactin raises their progesterone, and progesterone has the pro-life, anti-aging effect. So melatonin has been confused by a lot of this rodent based research which is opposite in many ways to what it does in people and pigs.

The effect of thyroid on the liver is to not only make it store energy to keep up the blood sugar and prevent the stress, cortisone and adrenaline reactions, but...to activate the liver so it can destroy 100% of the estrogen arriving at the liver. The liver, when it has adequate protein and thyroid, is just absolutely efficient at getting rid of the estrogen. So when you lower the thyroid function, you raise the estrogen that is allowed to circulate in the organism. That happens not only from low thyroid or high melatonin, but from malnutrition, especially protein deficiency, doesn't let the liver have this detoxifying function. So low protein amounts to low thyroid in many ways, and leads to excess estrogen, abnormal risk of blood clotting, stroke and heart disease, and so on.

If you look at the ovaries, when, in a dog or a cow, for example, they have removed the animal's thyroid, the ovaries develop a polycistic condition, instead of just one dominant egg follicle preparing for ovulation, the ovaries fill up with a lot of these fluid filled chambers, and ovulation is abnormal, and they develop the tendency to produce an excess of estrogen. So at many levels low thyroid leads to excess influence, persistence and overproduction of estrogen.

And it's interesting that the accumulation of fluid -- it's one of these mucopolysaccharides again -- that swells up, fills up these many cystic follicles in the ovaries -- it's the same sort of material that fills up the eyeball in glaucoma, which is also promoted by low thyroid and high pituitary hormones.

There are these integrating factors that, in some ways [is] like an all or nothing function for the body, the direction of estrogen dominance, or the direction of thyroid and progesterone dominance. And low protein used to be just sort of a laboratory experiment, but in the last 3 or 4 years, books have come out advocating almost a protein-free diet, so I've had the chance to see many people who have absolutely low thyroid symptoms with high estrogen simply because they're not

eating adequate protein. It probably should be something like at least 50 grams of the highest quality protein available.

One thing that happens in the vegetable diet, heavily based on [the] cabbage family, or beans, lentils and nuts, these proteins, in quality, rank about 15 times lower than the highest quality protein. And so even though a person might think they're eating nothing but protein rich foods, beans and nuts, their quality is so low that their liver simply can't respond to the thyroid. Besides that, the beans and nuts have many anti-thyroid factors. Some of these are being promoted for different effects that they achieve. Bioflavinoids, the so-called essential fatty acids or the unsaturated fats, these are, among other things, pro-estrogen and anti-thyroid. So it's a combination of low protein and a whole lot of thyroid inhibiting chemicals the population is being exposed to that is increasing the incidence of a lot of these degenerative diseases.

The unsaturated fats show up first in animals after weaning. In some experiments, when the pregnant animal is given a certain amount of these bean oils, soybean oil for example, or corn oil, the mother's body protects the fetus from absorbing these, and the little bit that gets into the fetus tends to be expelled into the fetus' intestine, showing that the developing embryo and fetus act as if they don't want to absorb unsaturated fats. The nursing baby also is highly protected so that if you look at the respiratory enzymes in their mitochondria, in all of their organs, especially the brain, during embryonic and fetal development, and even during nursing, these are extremely deficient in unsaturated fatty acids that are called essential fatty acids.

And in some experiments, they found that the brain didn't develop properly if the developing fetus didn't have saturated fats in sufficient quantity, and if an extreme amount of unsaturated fats were fed to the pregnant animals, the baby's brain was inhibited. And this is being reviewed in the last few months. People are pointing again that an excess or even high normal amount of the unsaturated fats causes retarded brain growth in late fetal development or during the nursing stage.

Even though the fetus in the mother's body, or receiving only maternal milk, even though it is protected against the unsaturated fats, at some point, the young animal begins eating food from the environment, and when you analyze the mitochondrial oxygen using enzymes, you see at this point they start absorbing the unsaturated so called essential fatty acids, and as they absorb the unsaturated fats such as linoleic acid, their activity declines; the respiratory enzymes themselves begin to act more slowly.

And when you look at the whole chain involved in oxygen consumption, which is essential for the high metabolic activity of young animals, the whole chain, from the respiratory oxygen using enzyme, all the way back to the production of thyroid hormone, and the transport of the thyroid hormone, at every stage conceivable, the unsaturated fatty acids, linoleic and linolenic -- and it's worse in proportion to the number of double bonds, so that linolenic is about half as inhibiting as linoleic acid to the thyroid and to the respiratory enzymes -- so the newborn or newly weaned animal has an extremely high respiratory rate and its brain is growing at a very fast rate, but as it absorbs these environmental vegetable synthesized fats, its metabolic rate slows down, its thyroid function slows down, and you get a curve of slowing activity from weaning, bending sharply at puberty and leveling off in the 20's and then going downhill, this curve is very closely similar to the curve of loading up of the tissues with the unsaturated fatty acids, and you can restore the activity of the

respiratory enzymes simply by changing the dietary fats.

But a complete change, since the fat layers, the adipose tissue, since it stores what the animal has been eating, it takes typically 4 years for a complete exchange of fat, even after you've made a complete change in your diet. But momentarily, if you, for example, take 1/2 an ounce of coconut oil, you get a burst of thyroid-like activity, and your cells respire more intensely for about an hour until that fat is burned up. But after about 2 years of a changed diet, you've burned up roughly half of your stored, inhibiting unsaturated fats, and your metabolism stabilizes at a much higher level.

So to correct the age-associated decline of thyroid function and respiratory energy production, you could take a thyroid supplement, or you could simply change your diet away from the inhibitors -- the fatty acids are one type of metabolic inhibitor, there are a few others -- for example the age pigment is something that is constructed inside our cells every time we're under stress and don't get enough oxygen. In effect, iron is released from storage, put into an activated state in which it can attack the unsaturated fats that happen to be in the cell at the time, and the combination of the unsaturated fat and the iron and the stress turns these unsaturated fats into age pigment or lipofuscin, which accumulates in all of the tissues. It's found as the main material in cataracts in the lens of the eye, in the atheroma in the wall of blood vessels that are deteriorating from age and stress, in the heart that is aging and susceptible to all kinds of malfunction, in the Alzheimer's brain and so on -- the age pigment accumulates, and it in itself gets an enzyme function which bypasses the good energy producing system.

So after a certain point, even changing your diet away from the toxic, inhibiting fats won't do the job of restoring your thyroid function if you have accumulated so much of this age pigment, because it is going to waste any oxygen that your cells can receive. At this point, a whole system of degenerative conditions sets in, in which the mucoproteins increase because of the stress conditions, which are basically the same as the low thyroid conditions -- all of these lead to accumulating mucoid materials accumulating -- the blood vessels are lined with this material, the red blood cells can't pick up oxygen as efficiently because of this mucopolysaccharide layer, the lung sacs get expanded and thickened so that the air doesn't diffuse through them efficiently, and that increases the susceptibility of the aging animal to stress. A smaller stress makes them more acutely oxygen deficient, and that produces the age pigment at an even higher rate.

Several people are working on ways to remove the age pigment. You can take brain cells in culture, which have age pigment in them, and one experimenter added vitamin E to the cultured brain cells, and found that in just 2 weeks the age pigment had been consumed or eliminated from the cells. But in that experiment, they administered the vitamin E dissolved in ethyl alcohol, and they had to do a control experiment giving just that amount of ethyl alcohol, and it turned out to be almost as effective as the vitamin E. So it's been known to be a free radical quencher -- it breaks the chain of lipid peroxide production. So that suggests that there are probably many antioxidants that would help to eliminate age pigment. But the first problem is simply to slow or stop the production of it by avoiding overloading on the things which are known to produce it such as soy oil, corn oil, excess iron, and so on.

Even chronic heavy meat eating tends to make American men overload their tissues with iron, and it happens that the immune system works better in people who, by national standards, are deficient in iron. In other words, their standards seem to be too high on what they recommend for adequate iron. It would be a little bit better to eat less iron.

NULL: Dr. Peat, we only have about 6 minutes to go in our program. I think it'd be good if you took that 6 minutes to explain how to build up a healthy thyroid gland to help overcome these conditions.

PEAT: Okay. The first thing is to make sure you're eating adequate protein, such as milk, cheese, eggs -- I'm naming them in order of declining iron content. Milk is designed to allow the newborn baby to escape or grow into the overcharge of iron it's born with. So milk is a way of helping to unload the body from iron -- milk and cheese are actually deficient in iron. And then eggs and shellfish, ocean grown fish, and particularly shellfish are beneficial, because shellfish use copper as their blood instead of iron, where ordinary fish use iron. So you can avoid iron by occasionally substituting oysters, lobster, shrimp or crab for fish, chicken or meat.

Vegetables are, in general, moderate to high sources of iron, but bread and pasta products have iron supplemented in this country, and that in itself is reason to totally give up bread and pasta, because you are actually seeing a serious increase in iron overload diseases in this country.

After assuring that you have a good high protein intake, then getting your calories in a safe and non toxic way is the next thing. And since the unsaturated fats are produced according to the coldness at which the organism grows, because our bodies live at 98 or 99 degrees Fahrenheit, their fats -- any organism that lives at that temperature, such as palm trees in the tropics, these fats have to be stable at high temperatures. But at refrigerator temperature they harden. And so organisms like fish that live in cold water, or soybeans or grains that live in cold climates, have to have unsaturated oils in proportion to the coldness of the environment, otherwise the cells couldn't metabolize -- the oils would harden.

And in those cold temperatures, the unsaturated oils don't get rancid very quickly. As soon as you eat an oil from a cold living organism it starts turning to peroxide varnish structure --

NULL: Remember, don't get too technical. We only have 2 minutes to go, and you gotta summarize.

PEAT: Okay. The ideal calorie source, I think, is tropical fruits, and tropical oils, especially coconut oil, and any tropical fruit that lives at a high temperature -- papayas, the custard apple family, pineapples, anything that is full of carbohydrates, is likely to be reasonably low in iron and high in all of the other vitamins and reasonable for minerals. And they are important as a source of magnesium. Meat and shellfish and fish and so on give you quite a bit of magnesium, but the fruits are a major source of magnesium without overloading us on iron and the toxic substances. Because fruits in general, from the tropics, have small amounts of the thyroid inhibiting substances.

Seeds in general have the thyroid inhibiting substances for a variety of reasons,

namely the worst of them is that plants evolve poisons to prevent their seeds being eaten, because they wouldn't have a next generation if animals found the seeds palatable and safe to eat -- so the worst poisons plants have are put in the seeds, and they turn out to be metabolic inhibitors -- enzyme inhibitors.

But the fruit, generally, is evolved to serve to distribute the seeds, so it's evolved to be safe to the animals. Potatoes are the only vegetable protein which is of quality equal to egg yolk. It's actually a little higher in quality because it contains precursors to the essential amino acids; it has more protein in effect than it actually has in substance. And people misjudge potatoes because they are given as 2 to 4%, because wet potatoes are measured, where beans are measured in the dry state and have 40% protein, but...you have to divide the bean protein by 10 to make it equivalent to potatoes.

NULL: So you're saying potatoes are good. Dr. Peat, we're out of time. I want to thank you very much for being with us. Very informed guest, very educational.