



PUBLIC LECTURE PRESENTED BY

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Restorative Endocrinology™ Series
“BALANCING FEMALE HORMONES”
PART 2

The Thyroid Connection ~ Sweet Cravings ~ Bone Health
&
How to Choose Hormone Replacement Therapy

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Illustrations by Lisa Orecchio and Norman Kars.

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THE THYROID GLAND

WHAT IS THE THYROID GLAND?

It is the largest of the seven endocrine glands, and is located in the front of the base of the neck.

WHAT DOES THE THYROID GLAND DO?

1. Controls the rate at which your body produces energy from food.
2. Affects the operation of all body processes and internal organs.
3. Helps control body temperature.
4. In children, it helps control the body's rate of growth.
5. Exerts a profound effect on mood and emotion through its action on brain chemistry.

HOW DOES THE THYROID GLAND PERFORM ITS FUNCTIONS?

1. The thyroid produces hormones and releases them into the blood stream where they are carried to virtually all cells of the body.
2. Thyroid hormones deliver specific "control messages" to the organs and cells, and thereby govern their functions.
3. The thyroid gland produces mostly T4 (93%) and a little T3 (7%). T4 must be converted to the active hormone, T3, in the cells of the various organs of the body. This conversion requires selenium-based enzymes.
4. For various reasons, the body may have difficulty converting T4 into the active T3. This is one reason why using only T4 (levothyroxine) medication is often an ineffective treatment for hypothyroidism.

THYROID HORMONE FUNCTIONS IN GREATER DEPTH*

MAJOR EFFECTS OF THYROID HORMONE (T₃ AND T₄) IN THE BODY

<i>Process or system affected</i>	<i>Normal physiological effects</i>	<i>Effects of hyposecretion</i>	<i>Effects of hypersecretion</i>
Basal metabolic rate (BMR)/temperature regulation	Promotes normal oxygen use and BMR. Enhances effects of sympathetic nervous system.	BMR below normal; decreased body temperature and cold intolerance; decreased or increased appetite; weight gain; reduced sensitivity to epinephrine and norepinephrine.	BMR above normal; increased body temperature and heat intolerance; increased appetite, weight loss; increased sensitivity to epinephrine and norepinephrine; may lead to high blood pressure.
Carbohydrate/lipid/protein metabolism	Promotes glucose catabolism; mobilizes fats; essential for protein synthesis; enhances liver's synthesis of cholesterol.	Decreased glucose metabolism; elevated cholesterol/triglyceride levels in blood; decreased protein synthesis; edema.	Enhanced catabolism of glucose, proteins and fats; weight loss; loss of muscle mass.
Nervous system	Promotes normal development of nervous system in fetus and infant; promotes normal adult nervous system function.	In infant, slowed/deficient brain development, retardation; in adult, mental dulling, depression, paresthesias, memory impairment, hypoactive reflexes.	Irritability, restlessness, insomnia, exophthalmos, personality changes.
Cardiovascular system	Promotes normal functioning of the heart.	Decreased efficiency of pumping action of the heart; low heart rate and blood pressure; sluggish circulation.	Rapid heart rate and possible palpitations; high blood pressure; if prolonged, can lead to heart failure.
Muscular system	Promotes normal muscular development and function.	Sluggish muscle action; muscle cramps; myalgia, fibromyalgia.	Muscle atrophy and weakness.
Skeletal system	Promotes normal growth and maturation of the skeleton	In child, growth retardation, skeletal stunting and retention of child's body proportions; in adult, joint pain.	In child, excessive skeletal growth initially, followed by early epiphyseal closure and short stature; in adult, demineralization of skeleton.
Gastrointestinal system	Promotes normal GI motility and tone; increases secretion of digestive juices.	Depressed GI motility, tone, and secretory activity; constipation.	Excessive GI motility; diarrhea, increased appetite.
Reproductive system	Promotes normal female reproductive ability and lactation.	Depressed ovarian function; sterility; depressed lactation.	In females, depressed ovarian function; in males, impotence.
Integumentary system	Promotes normal hydration and secretory activity of skin.	Skin pale, thick and dry; facial edema; hair coarse and thick, loss of outer 1/3 of eyebrows, overall hair loss.	Skin flushed, thin and moist; hair fine and soft; nails soft and thin.

*This chart was taken in part from Marieb, E., RN, PhD, *Human Anatomy and Physiology, Fifth Edition*, Benjamin Cummings, 2001

MOST COMMON TYPES OF HYPOTHYROID PROBLEMS

1. Functional hypothyroidism from weakened adrenal glands (*stress handling glands*) due to prolonged stress.

2. Functional hypothyroidism caused by Estrogen Dominance (*an imbalance between levels of estrogen and progesterone*).

3. Nutrient deficiencies required for normal thyroid hormone synthesis, release, and function.

4. Thyroid Disease—Primary Hypothyroidism (*high TSH and possibly low T_4 or T_3*)
 - Thyroid hormones are usually prescribed for thyroid disease. However many women on thyroid hormones may have test results that appear normal, but are still suffering from many hypothyroid symptoms.
 - For successful treatment of any thyroid disease, the first three problems mentioned above must also be addressed.

WHAT TO DO ABOUT SWEET & CARB CRAVINGS

1. Don't skip breakfast.
2. Eat every two hours. (*protein and complex carb*)
3. Avoid refined carbs and sugars which cause exaggerated ups and downs in blood sugar levels and promote sweet and carb cravings.
4. See the "*Lower-Carb Mediterranean-Type Diet*" handout for more details on how and what to eat.
5. When needed, use **Gymnema** 4 gram tablet 1-2 tabs 3x/day (*MediHerb*) to help stop sweet and carb cravings.

Think of your metabolism like a fire that needs fuel to keep burning. The fuel is blood sugar.

Proteins and fats are the logs for the fire, carbs are the kindling. When you have trouble getting the fire started (*as with low energy, low mood*) you crave the kindling.

Refined carbs and sugars are like paper on the fire—they get the fire going quickly (*and lift your energy and mood*), but it goes back out just as fast (*energy and mood drop*).

When you keep stoking your fire with paper, the rapid ups and downs in blood sugar cause corresponding ups and down in energy and mood.

Refined carbs and sugars have been stripped of fiber and most of their nutrients—they are anti-nutrient foods because to burn them for energy your body must supply the nutrients that were removed. (*Most packaged foods labels "low-fat" are full of refined sugars.*) Low-fat and skim milk are refined milk sugars when the fat is removed.

Nature packages foods with the nutrients required to run the biochemical cycles inside the cells (*glycolysis, Krebs Cycle, Electron Transport, etc.*) that break down the food and turn it into energy.

The refining and processing of foods destroys or removes the majority of nutrients. A single food contains dozens and sometimes hundreds of nutrients and phytonutrients.

Six or so imitation vitamins are added back to refined foods and they are labeled enriched or fortified.

If someone steals \$100 from you and gives you back \$6, do you feel enriched? Fortified? Or perhaps mugged?

When you eat refined carbs, sugars, sodas, etc., you are being nutritionally mugged.

The result:

- a) Increased sweet and carb cravings
- b) Decreased ability to burn the fuel for energy because of nutrient depletion
- c) Unstable mood and energy
- d) Weight gain
- e) Constant fuel and energy crisis
- f) Challenge to the hormonal system to handle all of this instability
- g) Increased functional hormone imbalances
- h) Downward spiraling vicious cycle

The answer: Go back to the top of the page.

LOWER-CARB MEDITERRANEAN-TYPE DIET

(The stressed-out person's diet)

The following will help balance blood sugar and hormone levels, help with Adrenal Fatigue, prevent ups and downs in energy and mood, and promote weight loss. It is also an extremely heart-healthy diet plan.

HOW TO EAT

1. Eat every two hours. This relieves the stress handling glands from the job of maintaining normal blood sugar levels between meals (via epinephrine and cortisol).
2. Do not eat carbohydrates alone; always add protein to your meals and snacks. It is especially important not to eat a carbohydrate-only breakfast.
3. Avoid stimulants—caffeine, sugar, alcohol, etc. Stimulants work by provoking the stress handling glands into releasing epinephrine and cortisol to raise blood sugar and release energy.
4. Avoid dead, devitalized and junk food. These foods cannot re-build a healthy body. They are also anti-nutrients—they rob any remaining nutrient stores from your body.
5. Avoid trans-fats and rancid fats. Cell membranes, nerve tissue, and steroid hormones (*vitality hormones*) all require healthy fats. Unhealthy fats interfere with these functions and structures.
6. Eat real, whole, fresh food. Minimize fruits and fruit juices. Most people will do well on a Mediterranean-type diet, combining some carbohydrates, protein and fat at each meal.
7. Salt your food liberally with sea salt. Stress handling glands need plenty of salt for normal function. Research has proven that eating salt does **not** cause high blood pressure or heart disease. Only people with organ damage, like kidney disease, need to be concerned with keeping a low salt diet. In fact, low salt diets contribute to adrenal fatigue.
8. Sea salt can be obtained from a health food store. It looks and tastes like “regular” salt, but contains the trace minerals that have been refined out of “regular” salt. For a good source of “Real Salt” visit www.realsalt.com or call 800-FOR-SALT (800-367-7258)
9. Drink plenty of water (filtered, or a reliable source of spring water, NOT tap water).

WHAT TO EAT

1. Eat foods rich in Omega 3 fatty acids such as fatty coldwater (*not farm grown*) fish, including salmon, tuna, trout, herring and mackerel. Eat walnuts, flaxseeds and green leafy vegetables. Or, if you prefer, take an Omega 3 supplement such as **Tuna Omega-3 Oil - 2 perles 2x/day**.
2. Use monounsaturated oils, especially virgin or extra virgin olive oil as your primary oil/fat source. **Note: Canola oil, although a monounsaturate, is a highly refined, genetically-engineered oil with none of the benefits of olive oil.**
3. Eat seven or more servings of vegetables and fruits every day. Fruits are minimized during the first few months. Vegetables & fruits should be fresh or frozen (*not canned*). Vegetables can be slightly cooked, steamed, or eaten raw.
4. Eat natural sources of good protein, (*not man-made deli meats*), and preferably organic meats (*raised without estrogenic hormones and antibiotics*).

(Continued on next page)

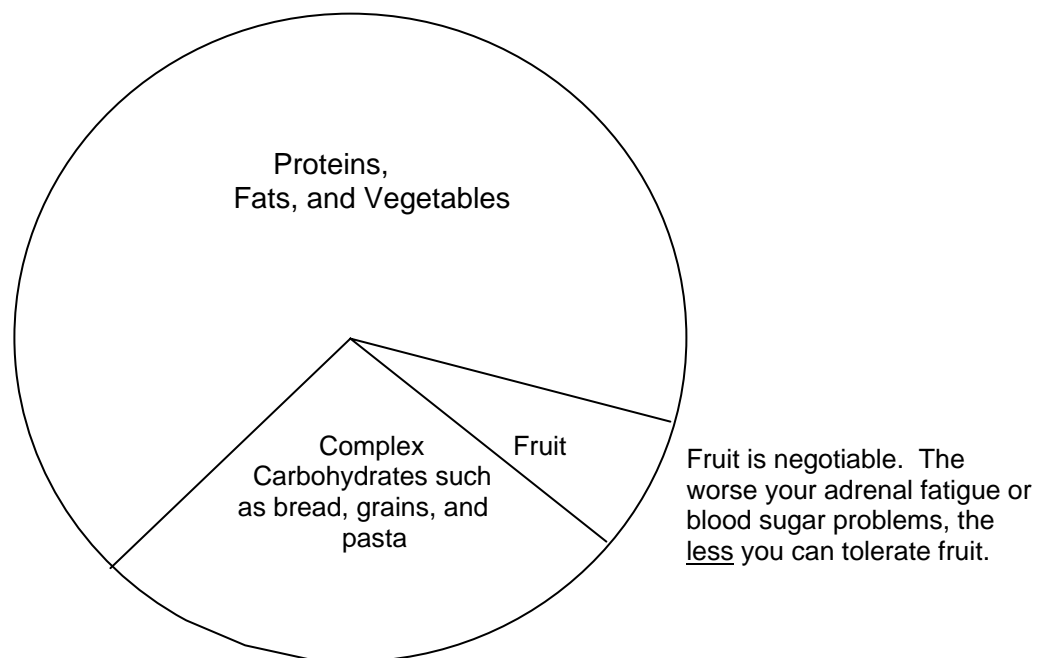
LOWER-CARB MEDITERRANEAN-TYPE DIET Cont'd

5. Eat more vegetable protein including peas, beans, lentils, and nuts.
6. Eat only organic whole grains (*non-commercial*). No refined carbohydrates (*like white flour, white rice, white pasta, white sugar*)
7. The best breads are found in the frozen section of the health food store. Look for organic sprouted grain breads (*sprouted grains have a higher protein and lower carbohydrate content than regular flour*). These must be kept refrigerated.
8. Minimize oils that are high in Omega 6 fatty acids, including corn, safflower, sunflower, soybean, and cottonseed oils.
9. Reduce or eliminate intake of trans-fatty acids (*all hydrogenated oils*), which are prevalent in margarine, vegetable shortening, and almost all commercially prepared packaged foods.
10. Make complex carbohydrates (*such as breads, pasta, and grains*) your smallest food group.

The Mediterranean-Type Diet, also known as the Crete Diet and Omega Diet, was compared to the Standard American Heart Association Diet in the Lyon Diet Heart Study in 1994.

"Compared to those on the AHA diet, patients on the Mediterranean-Type Diet had an unprecedented 76% lower risk of dying from cardiovascular disease or suffering heart failure, heart attack, or stroke! Remarkably, the new diet had proven more effective at saving lives than any other heart diet, drugs, lifestyle program, or any combination of these elements." {See *The Omega Diet: The Lifesaving Nutritional Program Based on the Diet of the Island of Crete*, by Simopoulos, Artemis, P., M.D., and Jo Robinson, Harper Collins Publishers, Inc., 1999. p9}

THIS IS YOUR PLATE. THESE ARE APPROXIMATE RECOMMENDED PORTIONS OF THE FOOD GROUPS DISCUSSED ABOVE.



For ideas of what to eat that can be applied to the above directions:

- ◆ *Why Can't I Lose Weight Cookbook* by Lorrie Medford, C.N., LDN Publishing 2001
- ◆ *Nourishing Traditions: The Cookbook That Challenges Politically Correct Nutrition and the Diet Dictocrats* by Sally Fallon and Mary Enig, PhD, NewTrends Publishing, Inc. 2001

WHOLE BEET VS. MULTI-VITAMIN

Do your vitamins provide?

These are the known active constituents found within an average BEET...

3-HYDROXYTYRAMINE
 ACETAMIDE
 ACONITIC-ACID
 ADENINE
 ADIPIC-ACID
 ALANINE
 ALLANTOIN
 ALPHA-LINOLENIC-ACID
 ALPHA-SPINASTERYL-GLUCOSIDE
 ALPHA-TOCOPHEROL
 ALUMINUM
 ARGININE
 ARSENIC
 ASCORBIC-ACID
 ASH
 ASPARTIC-ACID
 BARIUM
 BETA-CAROTENE
 BETA-INDOLEACETIC-ACID
 BETA-SITOSTEROL
 BETAINE
 BETANIDINE
 BETANIN
 BETANINE
 BORON
 BROMINE
 CADMIUM
 CAFFEIC-ACID
 CALCIUM
 CARBOHYDRATES
 CHLOROGENIC-ACID
 CHROMIUM
 CITRIC-ACID
 COBALT
 CONFERIN
 COPPER
 CYSTINE
 D-ALPHA-OXYGLUTARIC-ACID
 D-RIBULOSE
 DAUCIC-ACID
 DIOXYMALONIC-ACID
 FARNESOL
 FAT
 FERULIC-ACID
 FIBER
 FOLACIN
 FORMALDEHYDE
 GABA

GALACTOSE
 GLUCOSE
 GLUTAMIC-ACID
 GLUTARIC-ACID
 GLYCINE
 GLYCOCEREBROSIDE
 GLYOXALIC-ACID
 GUANINE
 GUANOSINE
 HETEROXANTHIN
 HEXOSANS
 HISTIDINE
 HOMOGENTISINIC-ACID
 HYDANTOIN
 HYDROCAFFEIC-ACID
 HYPOXANTHIN
 INVERTASE
 IRON
 ISOLEUCINE
 KAEMPFEROL
 KAEMPFEROL-GLYCOSIDE
 KILOCALORIES
 L-ARABINOSE
 LEAD
 LEUCINE
 LINOLEIC-ACID
 LITHIUM
 LYSINE
 MAGNESTUM
 MANGANESE
 MELILOTTIC-ACID
 MERCURY
 METHIONINE
 MOLYBDENUM
 MUFA
 NEOBETANIN
 NIACIN
 NICKEL
 NITROGEN
 OLEANOLIC-ACID-3-O-BETA-D-GLUCOPYRANOSIDE
 OLEIC-ACID
 ORNITHINE
 OXALIC-ACID
 OXYCITRONIC-ACID
 P-COUMARIC-ACID
 P-HYDROXY-BENZOIC-ACID
 PALMITIC-ACID
 PANTOTHENIC-ACID
 PENTOSANS
 PHENYLALANINE
 PHOSPHORUS
 PHYTOSTEROLS
 POTASSIUM
 PRAEBETANINE
 PROLINE

PROTEIN
 PROTOPORPHYRIN
 PUFA
 QUERCETIN
 QUERCETIN-GLUCOSIDE
 QUINIC-ACID
 RAFFINOSE
 RAPHANOL
 RIBOFLAVIN
 RUBIDIUM
 SALICYLIC-ACID
 SEDOHEPTULOSE
 SELENIUM
 SERINE
 SFA
 SILICON
 SODIUM
 STEARIC-ACID
 STRONTIUM
 SUCROSE
 SULFUR
 SYRINGIC-ACID
 TARTARIC-ACID
 THIAMIN
 THREONINE
 TIN
 TITANIUM
 TRICARBALLYL-ACID
 TRYPTOPHAN
 TYROSINE
 VALINE
 VANILLIC-ACID
 VANILLIN
 VIT-B-6
 VULGAXANTHIN-I
 VULGAXANTHIN-II
 WATER
 XYLOSE
 ZINC
 ZIRCONIUM

The synthetic form of the circled nutrients combine to produce the #1 selling multivitamin.

Could anything be missing?

Synthetic supplements and processed foods do not provide most of the nutrients found in whole foods... that your body needs!



Dr. Duke's Phytochemical and Ethnobotanical Databases. Ed. Sept 1994. United States Department of Agriculture Agricultural Research Center. April 2006. <<http://www.ars-gnn.gov/duke>>

THE ANATOMY AND PHYSIOLOGY OF BONE

BONE STRUCTURE

- ◆ Bone is formed from a collagen-protein matrix or framework, into which minerals deposit. This combination allows bone to be strong and hard, as well as flexible.

BONE COMPOSITION

- ◆ Bone matrix is formed from specific proteins and collagen fibers. This framework is similar to the steel infrastructure of a building. It constitutes about 1/3 of bone composition.
- ◆ Mineral salts deposit within the matrix, and form about 2/3 of bone composition. Minerals harden bone like the concrete poured into the infrastructure of a building, only bone is much more flexible.
- ◆ Many minerals compose bone including calcium, phosphorus, magnesium, and a host of trace minerals such as copper, zinc, manganese, boron, and silica. Many vitamins are needed for minerals to deposit into bone structure including vitamins A, C, D, E, K, and also EFAs (*essential fatty acids*).

BONE REMODELING

- ◆ Unlike buildings, bone is a living tissue and is constantly remodeling (*that is, breaking down and building up*). The body must break down the old bone to provide the building sites for new bone to rebuild.
- ◆ This is a normal and necessary process to maintain healthy bones.
- ◆ Remodeling requires a constant supply of bone-building material. (*proteins, vitamins and minerals*)

NOTE: Fosomax-type drugs (biophosphonates) function by blocking the breakdown of old bone, which in turn, interferes with the rebuilding of new bone. The result—bone scan scores improve, but bone health does not.

HORMONAL CONTROL OF BONE METABOLISM

1. Progesterone stimulates new bone growth.
2. Testosterone stimulates new bone growth and promotes its strength and toughness.
3. DHEA stimulates bone growth.
4. Estrogen slows bone loss.

EXTREMELY IMPORTANT NOTE

All of the above hormones belong to the same family of hormones (the steroid family) and each hormone can only properly play its role in bone health when in the correct balance with its other family members. Hormone replacement that uses high and/or imbalanced amounts of any of the family members causes interference with their ability to function correctly.

5. Cortisol—excess cortisol in response to excess stress causes bone breakdown.

MECHANICAL STRESS AND BONE HEALTH

1. Bones grow and remodel largely due to the mechanical stresses, forces and demands made on them.
2. Gravity and exercise cause compression forces, and muscle tendons pulling on the bones exert tension and torquing forces.
3. This is the reason exercise, especially weight training and weight-bearing exercise, strengthens bone.
4. Without adequate movement, weight bearing and resistance exercises, bone mass is lost.

OSTEOPOROSIS

See *Perfect Bones: A Six-Point Plan to Promote Healthy Bones*,
by Pamela Levin, R.N., The Nourishing Co.

~ This is the only book I recommend on understanding bone health and osteoporosis. ~

DEFINITION

- Osteoporosis involves both the weakening of bone matrix and demineralization.
- Women typically reach their height of bone density at age 30.
- From age 30 on, many women will lose bone mass at the rate of about 1% per year.

MOST COMMON FACTORS LEADING TO OSTEOPOROSIS

1. Poor childhood nutrition
2. Poor nutrition in puberty when 60% of bone mass is being formed
3. Poor nutrition in general, causing lack of ongoing building material for remodeling bone
4. Dieting—gaining and losing weight multiple times, as well as being too thin.
5. Food disorders—bulimia, anorexia nervosa, sugar sensitivity/allergy
6. History of exercise level and type throughout lifetime:
 - Too little exercise does not stimulate healthy bone remodeling.
 - Excessive exercise can cause excessive breakdown, and sometimes hormonal deficiency in women.
7. Smoking
8. Excessive alcohol consumption
9. Medications such as steroids, oral contraceptives, anticoagulants, diuretics, anticonvulsants, lithium, thyroxine--Greenwood-Robinson, Maggie, PhD, *The Bone Density Test*, Berkley Books, (2000) p17
10. Hormonal imbalances:
 - Estrogen Dominance
 - Low progesterone
 - Low testosterone
 - Low DHEA
 - High cortisol (*causes bone loss*)
 - Low estrogen
11. Premenopause Syndrome—this state of Estrogen Dominance/progesterone deficiency accelerates premenopausal bone loss.
12. Premature, surgical, or chemical menopause, especially if the ovaries are removed
13. History of amenorrhea lasting more than a year
14. Intake of high doses of alpha tocopherol (*"vitamin E"*), synthetic *"vitamin A"*, or synthetic ascorbic acid (*"vitamin C"*) can cause bone loss.

"The Nurses Health Study" followed the dietary habits of 85,000 female nurses over the course of ten years. When evaluating the relationship between vitamin K (found in green leafy vegetables) and osteoporosis, researchers "came to the conclusion that the nurses who ate the most vitamin K were about a third less likely to get a hip fracture... the significance of taking vitamin K was greater than taking synthetic estrogen... **Women who took a lot of vitamin D, but had low intakes of vitamin K, had doubled risk of hip fracture!**" From *Life Extension Disease Prevention & Treatment, Expanded Third Edition: Scientific Protocols that Integrate Mainstream and Alternative Medicine*, by Life Ext. Foundation, (2000) p504

ACID-STOPPING MEDICATIONS

(The “purple pill”– type medications)

Long Term Problems

DISCUSSION

Acid-stopping medications (the “purple pill”-type medications) work by interfering with the “proton pump” and stopping the production of hydrochloric acid by the gastric parietal cells in the stomach.

These drugs induce a state of hypochlorhydria in the stomach, which negatively affects the function of the other digestive organs. A pH of about 2-3 (*very acidic*) in the stomach is necessary (*and normal*) for healthy digestion. The stomach lining is designed to handle its own strong acid production, which has many vital functions outlined below.

Initially this class of drug was strictly controlled and only permitted to be prescribed for a six-week period for ulcers and acid reflux. Now they are used for months and even years at a time, and are routinely prescribed for any and all GI symptoms. They are given to all age groups including children, infants, and even pets.

Acid stopping medications are the number one selling drug in the country and are even available over the counter. **Antacids** can cause similar problems listed below.

PHARMACOLOGY OVER PHYSIOLOGY

It is officially reported that there are few side effects to these drugs, and that the side effects tend to be mild. But what is actually being perpetrated is a form of **physiological and biochemical insanity**.

The main reason that this is insanity is that over 90% of people with “acid indigestion” and “acid reflux disease” are not making too much stomach acid, but too little stomach acid.

Here are the physiological facts:

1. We have been told that stress makes our stomachs pump out too much acid, causing heart burn and ulcers. Yet any physiology textbook tells us that when the stress handling system in our bodies is engaged (sympathetic nervous system), digestion is suppressed. When engaged in handling stress, the body diverts available energy away from regenerative functions like digestion. (*Digestion is a parasympathetic function.*)
2. When we eat food while in a stress-handling mode (*sympathetic nervous system function*), the food sits in the stomach—a nice warm, moist environment—and begins to decay rather than digest.
3. It is the decaying food in the stomach that produces organic acids of putrefaction and fermentation, and these are the acids of acid indigestion. Undigested, decaying food tends to come back up (*“acid reflux disease”*) rather than continue down the digestive tract.
4. Acid-stopping medications and antacids can make the resulting symptoms—heartburn and acid reflux—better, but they make the original problem worse. And over time, a host of other problems follow.

(Continued on next page)

WHAT ARE THE RESULTS?

1. Progressive malabsorption and malnutrition

- Healthy digestion begins with strong acid production in the stomach.
 - a. Mineral digestion—almost all minerals require strong stomach acid for proper digestion.
 - b. Protein digestion—protein digestion begins with strong stomach acid.
 - c. Pancreatic enzyme release—a pH of 2 or 3 (*very acidic*) in the stomach is the “on switch” signaling the pancreas to produce and release its digestive enzymes.
 - d. Liver and gall bladder function—a pH of 2 or 3 (*very acidic*) in the stomach signals the release of bile from the liver and gall bladder. Healthy bile flow is essential to emulsify (*break down*) and absorb fat soluble vitamins and nutrients. Without healthy bile flow, undigested fats in the intestines interfere with mineral and other nutrient absorption.

2. Progressive Toxicity

- When food is not digested properly beginning in the stomach, it will putrefy and ferment—literally rot—as it proceeds through the warm, moist environment of the GI tract, resulting in systemic toxicity.

3. Hypochlorhydria

- A state of ongoing hypochlorhydria is induced.
- What disease processes are related to hypochlorhydria? The short answer is any and all disease processes, especially degenerative diseases.
- For a detailed discussion of hypochlorhydria and its many consequences, which were clearly understood in medicine in the earlier part of the 20th century (*before antacid medications*), see the three-part article “Hypochlorhydria—A Review” by Judy Kitchen in *The Townsend Letter for Doctors and Patients*, Oct., Nov., and Dec. 2001.

4. Parasite Infections—loss of aseptic function

- The low pH of gastric juice is designed to sterilize food. Without the acid pH of the stomach, a person is susceptible to any type of food- or water-borne parasite.
- Parasite infections have become far more common than is currently recognized, primarily due to lack of proper testing procedures. A single random stool test (*as performed in hospitals*) is very unlikely to detect most parasite infections. Specialty testing must be done, such as the Diagnos Techs GI-2 (*a multiple sample saliva and stool test*).

5. Degeneration of the gastric mucosa

- Another result of prolonged use of acid-stoppers is degeneration of the gastric mucosa. This is why most users of these medications have even worse stomach burning if they try to stop these drugs.
- When correcting digestive problems with natural remedies after the use of acid-stopping medication, the problem usually takes many months to correct. It appears that considerable degeneration of the gastric mucosa takes place. This makes sense, since the constant presence of rotting food on the mucosa has to cause problems. The first part of the natural protocol must therefore address the healing of the gastric mucosa before any boosting of gastric secretion can take place.

OSTEOPOROSIS PROTOCOL

INITIAL CONSIDERATIONS

- Hormone testing and balancing is essential to healthy bone formation, as previously discussed.
- Healthy acid production in the stomach is necessary for mineral digestion.
- Healthy gall bladder function is essential to emulsify fats and oils to digest fat soluble nutrients for proper mineral usage. Additionally, undigested fat in the intestines block mineral absorption.
- Avoid elemental (*inorganic*) forms of minerals like calcium carbonate and magnesium oxide.
- Consider testing female hormone levels
- Consider doing a Hair Analysis to evaluate overall mineral metabolism
- The daily recommended calcium supplement amount for women is 1200-1500mg/day. It is set this high because most studies have been done on indigestible calcium carbonate. Calcium carbonate is also difficult to ionize once it's in the body. When using more digestible and ionizable calcium, the dosage does not need to be that high. Coral calcium is primarily calcium carbonate.
- Remember, this is calcium supplementation, not calcium replacement. A healthy diet contains a lot of calcium sources.

PROTOCOL

Choose from the following:

1. **Catalyn—Dosage—3 tablets 2x/day**
 - a. An excellent source of vitamin D (*about 100 IUs per tablet*)
 - b. A whole food multiple formula recommended as a good nutritional base for everyone *including your pets. (Contains about 100 IU Vitamin D per tablet)*
2. **Cataplex A-C or ACP—Dosage—3 tablets 2x/day**
 - a. Both vitamins are needed for bone remodeling
3. **Calcifood Wafers—Dosage—3 wafers 2x/day or powder 1-2 tablespoons/day (Bio-Dent is Calcifood in tablet form)**
 - a. Source of calcium and phosphorus
 - b. Also contains all the trace elements—minerals, protein, amino acids, and enzymes—needed to make bone tissue
 - c. Also excellent for growing children (*and pets*)
4. **Ostrophin PMG—Dosage—3-6 tablets/day**
 - a. Contains the protomorphogen to assist in the growth and remodeling of bone
5. **Chlorophyll Complex¹ – 2 perles 2x/day**
 - a. Source of vitamin K—the “forgotten vitamin” for bone health
 - b. Vitamin K is required to produce osteocalcin—the protein in bone tissue that crystallizes calcium
6. **Zypan—2 tablets/meal if needed**
 - a. A strong acid influence is required in the stomach (*at least 3 or below*) to absorb calcium and most other minerals

(Continued on next page)

- b. Source of betaine hydrochloride which upon contact with gastric juices is converted into HCL
- c. Many people have very compromised digestion which results in stomach burning or may even be taking an acid stopping medication long-term. These conditions require addressing the health of the stomach mucosa before **Zypan** can be given. Also with general weakness in digestive ability resulting in gas, bloating, etc., consider the need for **Zypan**.
- d. See the "ULCER PTOTOCOL" page and also the description of "THE PROBLEMS CAUSED BY ACID STOPPING MEDICATIONS" page which is located in the digestion section of my seminar manuals.

OTHER CONSIDERATIONS

1. **Cataplex D**
 - a. Many people are dramatically deficient in vitamin D and usually need appropriate testing and dosing. See Vitamin D page in Protocol section.
2. **Magnesium Lactate—Dosage—2-6 capsules/day**
 - a. Needed for calcium to be bioavailable
 - b. Hair Analysis will give you the information on the need for Mg—which is a very common and increasingly severe deficiency in the American population. The indications for Mg supplementation include biounavailable Mg (*a high reading on the chart*) and/or a low Ca to Mg ratio < 3.3 which indicates an Mg loss.
 - c. Mg also plays hundreds of other roles in the body including being the mineral activator of 500-600 enzymes, required for relaxation of all forms of muscle and needed in the Krebs Cycle to make ATP.
3. **Copper Liver Chelate—Dosage—1 tablet 2-3x/day**
 - a. Copper is needed to put calcium into bone
 - b. Indications for copper supplementation on a Hair Analysis include a Na/K inversion (*because Cu elevates Na and helps pull the patient out of more advanced adrenal fatigue*); high Cu (*biounavailable*) and sometimes in fast oxidizers who tend to run low in both Cu and Zn.
 - c. Remember Cu only works properly with the right proportion of Zn which is 8:1 Zn/Cu ratio on a hair analysis.

UNDERSTANDING BONE DENSITY TESTS

- DEXA or Dual-Energy X-Ray Absorptiometry is considered the best method currently available to measure bone density.
- Reading a DEXA report is often as confusing as reading your phone bill.
- The test includes measurements of the hip, vertebrae (L4), and wrist, evaluating both trabecular (*spongy*) and cortical (*rigid*) bone.
- **It is important to understand that DEXA measures bone density and not bone quality.**

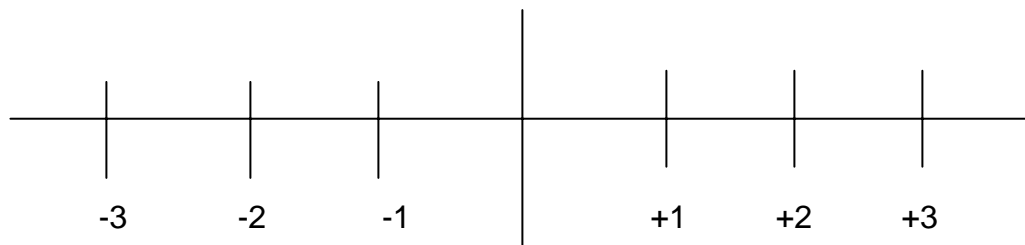
READING THE TEST

TWO SCORES

1. T-Score is a numerical comparison to the average bone density found at peak bone mass (*a 30 year old*)
 2. Z-Score is a numerical comparison to the average bone density of an age-matched subject
- **It is important to understand these are numerical representations of an average skeletal frame.**
 - **Women who are petite will often have lower scores, and this should be accounted for.**

SCORING

Both scores are measured on a bell curve using standard deviations from normal.



- A negative score indicates lower bone density; a positive score indicates greater bone density.
- A 0 score indicates a bone density the same as the value you are being compared with.

Normal = a T-Score between -1 and +1

Osteopenia = a T-Score between -1 and -2.5

Osteoporosis = a T-Score at or below -2.5

Significant risk for fracture = a Z-Score below -2

PROBLEMS WITH DEXA

→ It is important to remember that DEXA does not evaluate bone quality and bone health, and so it is not as accurate of a test as it is usually touted to be.

- “Ideally,” states J.C. Prior of the Division of Endocrinology and Metabolism at the University of British Columbia, the results of such tests “should be shown to correlate with the ashed mineral content of the bone, to parallel the tensile strength of bone, and predict the fracture frequency. None of the reported measurements can yet meet all these criteria.”¹
- Indeed, according to J.E. Compston, Dept. of Medicine, University of Cambridge, some studies report that large increases in bone mass as seen in bone mineral density studies may actually be associated with a reduced bone strength and unchanged or increasing fracture rates! In fact, recent studies “indicate that fracture prevention is not necessarily associated with increase in bone density.”²
- “Truly healthy bones are not only dense, they are also flexible, supple, and strong as a result of healthy micro-architecture. Bone density tests don’t measure these characteristics, which correlate more with fracture than density”³
- Dr. John Lee recommends using the scores for the lumbar vertebrae (*cortical bone*) rather than the trabecular bone. Cortical bone is “relatively large and uniform, and the test results are generally more clinically accurate.”⁴

¹J.C. Prior, “Progesterone as a Bone-Trophic Hormone” in *Endocrine Reviews*, Vol. 11, No.2, May 1990, p6

²Bodmer, Kerry, “Editronate and Osteoporosis,” *Women’s Health Newsletter*, Vol.7, No.5, May 1998, p6

³Levin, Pamela, R.N., *Perfect Bones; A Six-Point Plan to Promote Healthy Bones*, The Nourishing Company, (2000) p35

⁴Lee, John, M.D., *Natural Progesterone, The Multiple Roles of a Remarkable Hormone*, BLL Publishing, (1993) p84

HORMONE TALK

Hormones—powerful biological chemicals produced by endocrine glands in very small amounts and then released into the blood stream and carried to cells of the body.

- Hormones initiate cell actions as well as help regulate, control, and coordinate body functions.
- Hormones from the different endocrine glands interact with each other in complex ways to coordinate the body's systems.
- Because hormones are so powerful in such tiny amount, their levels are precisely and carefully monitored and controlled.

Hormones are measured in:

- **Nanograms** {*ngs-parts per billion*}—"One part per billion is like putting a pinch of salt into 10 tons of potato chips."
- **Picograms** {*pgs-parts per trillion*}—"This is like placing one drop of water into a six-mile-long train with 660 tank cars!" *

Hypothalamus-Pituitary Axis (H-P Axis)—the hypothalamus and pituitary glands are located in the brain and they control and oversee functions of the hormonal system in general. The H-P Axis is like the central control switch of the endocrine system.

Cell Receptors—the "gates" located on cell membranes (*cell surfaces*) that control the entry of hormones and other biochemicals into cells

Receptor Up-Regulation—increased sensitivity of the cell's receptor to its hormone, causing magnified cellular response

Receptor Down-Regulation—decreased sensitivity of the cell's receptor to its hormone, blunting the hormone's effect in the cells

Hormone Overdose—a hormone that exceeds its normal physiologic reference range (*whether given externally or made in excessive amounts internally*)

Hormone Overdose & Receptor Down-Regulation—when any hormone repeatedly exceeds its normal physiologic reference range, cell receptors for that hormone down-regulate. The result is progressive deficiency symptoms of the overdosed hormone.

Bioidentical Hormones—natural plant-derived hormones that are chemically and structurally the same as human hormones. In the case of female and male hormones, a chemist or pharmacist compounds plant sterols from wild yam or soy into bioidentical estrogen, progesterone, testosterone, DHEA, etc.

* Berkson, Lindsey D., *Hormone Deception*, p9

GUIDELINES TO BIOIDENTICAL HORMONE USE

1. Appropriate testing and monitoring must always be done to determine ongoing need and dosage.
2. Whenever possible, strengthen and balance the body's own glands and systems to optimize hormone output rather than use bioidentical hormone replacement.
3. When using hormones, always follow the body's designs and stay within physiologic reference ranges. Too much of a hormone will cause as many (*if not more*) problems over time than deficiency of a hormone.
4. Hormones are NOT supplements. Hormones, including bioidentical hormones, are powerful chemicals. The body is literally obsessed with monitoring and controlling their levels and activities. When not used according to the body's design, they can cause countless problems.
5. Many women can initially feel improvement on bioidentical HRT, but unless this is carefully monitored and controlled, the feeling of improvement often doesn't last.
6. If the bioidentical HRT is excessive or imbalanced, or just not correct for the individual, over time regression or even worsening hormonal problems can occur.
7. Keep in mind that even small physiologic doses given to a woman who does not need a hormone, is an overdose.
8. Always use the smallest possible effective doses for the shortest time needed. Accompany hormone replacement with appropriate natural support to the gland.
9. The goal is to help the gland regain normal function and hormone output whenever possible.
10. When glands have been surgically removed—as with a total hysterectomy—ongoing bioidentical HRT may be required. Testing and monitoring is still necessary, as individual need will vary widely from woman to woman.
11. Topical bioidentical hormone creams and gels build up in the system by storing in the subcutaneous tissue (*fat cells beneath the skins' surface*). After several months of use, it is typical that cream or gel forms of hormones progressively overdose their users. See "*Problems Associated With Bioidentical Transdermal Hormone Cream & Gels*" page.
12. Additionally, topical creams and gels cannot be accurately monitored by routine blood tests. See *same handout as mentioned above*.
13. The most effective, least problematic method of bioidentical hormone delivery at this time is sublingual (*under the tongue*), either through liquid drops or tablets that are crushed and held under the tongue for several minutes.
14. Never underestimate the regenerative and recuperative powers of the incredible human body. It is possible to restore strength and balance to the endocrine system at any age. When bioidentical hormones are needed and used properly, they are a safe and wonderful tool. But using hormones is somewhat like using crutches. Whenever possible our goal is to assist the healing process, restore optimal function, and put the crutches aside.

REVIEW OF HORMONE TESTING METHODS

Routine Blood Tests

- Test for the protein-bound form of hormones
- Protein-bound is the inactive circulating reservoir of hormone
- More than 99% of most hormones are in the bound form

Serum 'Free' Tests

- The 'free' fraction is the unbound, physiologically active form of the hormone
- Although 'free' fractions can be tested via blood tests, it is not routinely done because it is very expensive

Saliva Tests

- Tests for the 'free' physiologically active form of the hormone
- Is far less expensive than serum 'free' tests

Are Saliva Tests Accurate?

Confusion still exists over the reliability of saliva testing. Here's why...The initial studies compared serum protein-bound tests with saliva 'free' fraction tests and found poor correlations. Further studies that compared serum 'free' fraction tests with saliva 'free' fractions tests found very close correlation. In other words, appropriate comparison studies between 'free' fraction hormones through blood and saliva showed both testing methods were accurate. *(The saliva test simply costs 10 to 20 times less.)*

Urine Tests

Test for hormone metabolites after liver breakdown and excretion *(Urine tests do not measure 'free' hormone fractions.)*

Hair Mineral Analysis

- This is a test of intracellular minerals
- Hair Analysis tells us nothing about the levels of hormones in the blood or saliva
- Hair Analysis *(intracellular mineral patterns)* are an indication of how effectively the hormones are delivering their messages at the cellular level *(indication of receptor sensitivity and cellular responsiveness)*

It is vital to understand that...

- bound hormone levels *(serum bound test)*
- free hormone levels *(saliva free fraction test)*
- metabolized hormones *(urine test)*
- receptor sensitivity and cellular response *(hair test)*

...all represent different methods used by the body to maintain control and balance over its biochemical messengers as they move through the system.

It is possible to test the same person with each of these tests and get four different answers.

Why?

Note: Any hormone test *(blood or saliva; bound or 'free')* will only detect bioidentical human hormones, not synthetic or horse hormones. Therefore, there is no accurate way to properly dose or monitor the use of these alien hormones in the human body.

PROBLEMS ASSOCIATED WITH BIOIDENTICAL TRANSDERMAL HORMONE CREAMS & GELS

and testing methods used to monitor their use

- Hormone creams and gels must be used very carefully and monitored closely with appropriate testing. Otherwise, this type of hormone preparation will, after several months or more of use, cause increasing problems in the majority of those who use them. *{And possibly in their family members too as topical hormone preparations are often “shared” via skin-to-skin contact when contact happens before all the preparation has been absorbed in the user.}*
- At the time of this writing however, the majority of practitioners and patients are still unaware of the potential problems inherent in the use of topical hormone preparations, the specific testing needed to monitor their use, normal physiological references ranges that should not be exceeded, and testing that does NOT accurately monitor the use of topical preparations. In fact, at this time, the use of hormone creams and gels is increasing dramatically. The following outlines many of the issues.
 1. Transdermal hormone creams and gels deliver ‘free’ (*non-protein bound or unbound*) hormones directly into the tissues and blood stream. ‘Free’ hormones are the active form of a hormone.
 2. Additionally, transdermal hormone creams and gels are absorbed into subcutaneous fat tissue, where they build up and can eventually saturate this tissue.
 3. After several months of transdermal hormone cream or gel use, the subcutaneous tissue stores start to spill back into the system, resulting in dramatic and progressive overdosing of the ‘free’ hormone fraction.
 4. How long it takes an individual system to overdose on hormone creams or gels depends on their fat cell content and overall metabolic rate. The more fat cells, as well as the slower the metabolic rate, the faster the overdosing can occur.
 5. Routine blood tests are for the protein-bound form (*protein-bound is the inactive form of a hormone*) and do not accurately monitor hormones that are administered in their ‘free’ form. (*Sublinguals also deliver hormones in a ‘free’ form but do not build up in the subcutaneous tissues.*)
 6. Routine blood tests of the protein-bound form of the hormone are especially inaccurate in monitoring the use of transdermal creams and gels, which not only enter the bloodstream in the ‘free’ form initially, but re-enter the system from the subcutaneous stores in the ‘free’ form. In both instances the liver was initially bypassed and no binding of these hormones occurred. Therefore, the routine blood tests are not initially affected.
 7. In addition, fat soluble hormones like the steroids (*and especially progesterone*) also travel through the bloodstream in an unbound state on red blood cells. These reserves are also not detected with routine blood tests.
 8. Transdermal hormone creams and gels change routine blood tests slowly and only over time. (*Routine meaning serum bound; serum ‘free’ can be ordered but are not done routinely because they are very expensive.*) Routine blood tests **cannot** accurately monitor the use of transdermal creams and gels. A person will be profoundly overdosed with ‘free’ hormone levels by the time routine blood tests show any significant changes.

(Continued on next page)

9. Serum bound tests are best for monitoring oral hormone administration. The oral route has a 1st liver bypass, meaning most hormones given orally will be protein-bound (*or excreted*) by the liver. This is why larger doses must be given orally. Only a small percentage (10-15%) actually reaches cell receptors as 'free' hormones after the liver excretes or binds the majority. (*Oral micronized forms have better tissue delivery than other oral preparations.*)
10. Because transdermal creams and gels eventually result in hormone overdose in most individuals, some saliva testing companies have arbitrarily elevated their "normal reference ranges" to account for this very abnormal situation. (*DiagnosTechs is a reliable saliva testing company for healthy reference ranges.*)
11. When hormone levels become routinely elevated such as with the use of transdermal creams or gels over time, or the use of larger than physiologic doses of any form of hormone replacement, receptor site down-regulation occurs.
12. This means that the cell receptors block the entry of the hormone being overdosed.
13. The end result is a combination of over dose symptoms AND **progressive** (*worsening over time*) deficiency symptoms of the very hormone that is being given to the system in excess.
14. Since hormones are interactive, the problem doesn't end here. Depending on the hormone(s) being overdosed, multiple other imbalances will cascade into the system.
15. Hormones given in amounts that exceed normal physiologic needs will cause receptor cell down-regulation (*once the liver can no longer clear the excessive levels*). In addition, Brain H-P Axis dysregulation is caused (*the central controlling switch for these hormones is thrown off balance*) as well as the affected gland can begin to atrophy.
16. Unfortunately, many practitioners using bioidentical transdermal creams or gels are unaware of these problems. If routine (*protein bound*) blood tests are being used to monitor transdermal cream or gel use, the overdosing can go undetected for a very, very long time.
17. Once a hormone cream or gel has been used long enough to saturate the tissues and send the free fraction hormone tests to excessively high levels, hormone balance cannot be reestablished until the excess is cleared from the system and normal receptor function has been reinstated.
18. When you administer a hormone in a 'free' form, you must test for and monitor it in a 'free' form (*saliva or serum 'free'*).
19. And finally, we still don't know all the different ways the hormone creams and gels can affect the body. It will take many studies and several years to sort it out. A small percentage of women seem to tolerate their use without becoming obviously symptomatic. What we do know, however is that they create a very abnormal situation in the tissues. The long-term effects of this are simply not known, so why take chances when other safe means of natural hormone replacement can be used if HRT is needed.
20. The safest way currently known to administer bioidentical hormones is sublingually, as this form does not build up in subcutaneous tissues. (*Any hormone administered onto the skin in a lipid {fat} soluble base is capable of subcutaneous tissue build up, saturation, and eventual overdose.*)

IMPORTANT NOTE: Keep in mind that many times hormones, even bioidentical hormones, are not the best first choice. This is especially so, for example, in menstruating women and individuals in a prolonged stress response.