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ANTI-AGING SPECIALISTS™

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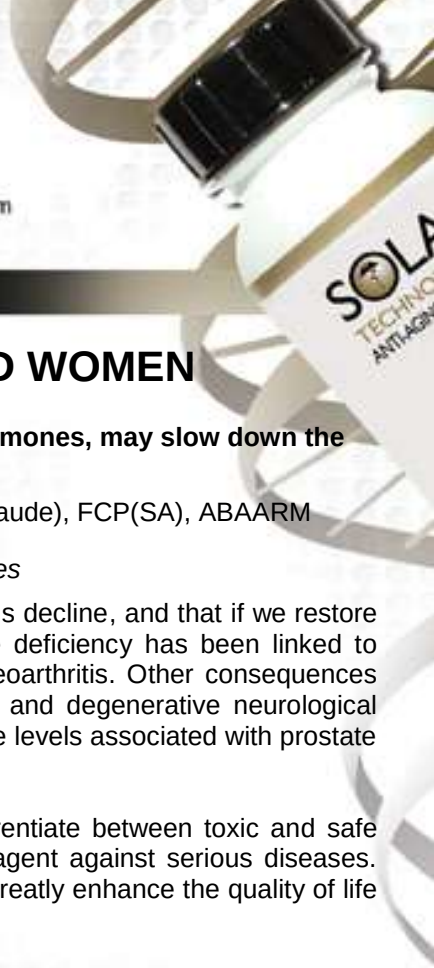

BIO-IDENTICAL HORMONES FOR MEN AND WOMEN

Supplementing with identical hormones as we age, to more youthful levels of hormones, may slow down the aging process

by Dr Craige Golding, American board-certified anti-aging physician, MBCHB (cum laude), FCP(SA), ABAARM

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It is becoming increasingly accepted that we age prematurely because our hormone levels decline, and that if we restore hormone levels to the optimal range we avoid many of the aging diseases. Hormone deficiency has been linked to diseases like cancer, heart disease, diabetes mellitus, dementia, osteoporosis and osteoarthritis. Other consequences include visual and hearing loss, fractures, frailty, incontinence, obesity, reduced libido and degenerative neurological diseases. Additionally hormone deficiency can cause cancer, such as the low testosterone levels associated with prostate cancer, or the low levels of progesterone involved in breast cancer.

In the wake of the controversial Women's Health Initiative studies, it is crucial to differentiate between toxic and safe hormone replenishment. Bio-identical hormone replenishment is a powerful protective agent against serious diseases. Understanding the difference between bio-identical and non-bio-identical hormones can greatly enhance the quality of life for patients.

Why synthetic, non-bio-identical hormones have so many side effects

Synthetic and pharmaceutical hormones are artificial chemicals that attempt to replicate human hormones. They are structurally foreign to the body. While bio-identical hormones have the identical molecular structure to human hormones, enabling easy metabolism, synthetic hormones are altered to have a different chemical make-up than natural hormones. It is this structural difference that has caused so many side effects over the years in HRT.

The immune system is well-documented to attack anything it perceives as foreign or toxic to the body. From an evolutionary aspect, it takes millennia to become accustomed to a new chemical entity. New foreign chemical entities are fraught with dangers, even in our food. An example is the relatively recent hydrogenation of liquid plant oils into foreign saturated fats and the formation of trans-fats, in food production. These foreign fats have only been around for the last 50 years and they result in increases in heart disease and cancer. Conversely, unsaturated plant oils *reduce* the risk of heart disease and cancer (eg olive oil, flaxseed oil & canola oil – all rich in omega 3 fats).

Similarly, synthetic non-bio-identical hormones have only been around for less than 50 years, compared to bio-identical ones, which have existed in our bodies since the birth of the human race. These synthetic hormones are associated with increased side effects and can very often be detrimental to your health. If they are used at inappropriate doses, and for too long a time period, or in aging people who have diseased blood vessels, there may be an associated increased risk for very serious medical complications. These complications include breast cancer or thrombotic disorders like deep vein thrombosis, stroke or heart attack. This is made worse if the hormones are administered orally, since the oral route greatly increases the production of blood clotting factors, via the first pass liver effect. This first pass metabolism does not occur with the transdermal route, and so blood clotting risk and thrombosis is reduced this way.

Pharmaceutical hormones like diethylstilbestrol, methyl testosterone, conjugated oestrogens, medroxyprogesterones,and birth control pills have all been linked to cancer.

Why Bio-identical hormones are recommended

In the 1960s Dr Charles Huggins received a Nobel Prize for his work with bio-identical hormones, decreasing the size of cancer tumours. But this work has been overlooked for decades. Today, after the Women's Health Initiative concluded there are great risks in prescribing synthetic HRT, bio-identical hormones are clearly the safest option.

Bio-identical hormones are entirely the same as human hormones. The chemical structure is the same as that produced naturally in the human body. Bio-identical hormone replenishment is used to restore hormone levels to normal physiological levels, based on blood tests, not at supra-physiological mega doses, based on symptoms alone, as is often the case with non-bioidentical, synthetic hormones. As mentioned previously, these hormones are mostly administered transdermally to avoid first pass metabolism in the liver. Bio-identical hormones are an integral part of maintaining health and a tremendous anti-aging tool.

Bio-identical hormones have been used in Europe and America for over 15 years and are a lot safer, have fewer side effects, and are generally not linked to cancer at all.

The benefits of pharmacy compounding of individualised medicines

Compounded medicines are unique, individualised pharmaceutical products formulated & adjusted to a patient's specific needs, symptoms or blood results. They allow for flexible dosages, concentrations, combinations and numbers of actives to be incorporated into one product.

Pharmacy compounding has been an essential part of healthcare since the earliest days of pharmacy. It is always prescribed by a physician or doctor in order to meet the needs of patients. As a valued part of today's healthcare, compounding currently supplies intravenous mixtures, parenteral nutrition solutions, paediatric preparations, and pain-management medications for patients whose medical needs would otherwise go unmet. The following factors continue to influence doctors and their prescribing habits:

1. We cannot always believe information provided by the media which most often reflects the goals of advertisers
2. Consider the money trail (industry, managed care, etc)
3. Citizen response does make a difference
4. The pharmaceutical industry spends huge amounts of money on marketing of patentable non-bio-identical hormones. Bio-identical hormones are not patentable, and thus not profitable for pharmaceutical companies to develop and market.

Typical ages that hormones decline	**Hormone**
Age 30	Human growth hormone
Age 40	Testosterone, Oestrogen, Progesterone
Age 50	DHEA (a decline is noted in late 20's), Thyroid
Age 60	Insulin, Parathyroid
Age 70	Calcitonin, Eryhtropoietin

A good approach to the safe use of hormones includes the following:

1. Correct only deficiencies (avoiding unnecessary treatments)
2. Carefully adjust the doses, personalising them to each individual
3. Doing regular follow-ups (with cancer screening)
4. Using small physiological doses (avoiding overdoses)
5. Correctly balancing the hormone system (rarely use one hormone on its own, because of the risk of unbalancing the system
6. Use bio-identical hormones (avoid synthetic derivatives of natural human hormones
7. Lifestyle changes to lower the risk of cancer are also important, for example: regular exercise; dietary adjustments (eating excessively or cooking at too high temperatures, altering diets high in saturated fat); focusing on positive emotions; nutritional supplementation, eg I3C, DIM, soy, flax and Omega-3.

So what bio-identical hormones do we have at our disposal?

1. Androstenedione	(for men and women)
2. DHEA (dehydroepiandrosterone)	(for men and women)
3. Estradiol	(for women)
4. Estriol	(for women)
5. Estrone	(for women)
6. Human Growth Hormone	(for men and women)
7. Cortisol	(for men and women)
8. Insulin	(for men and women)
9. Melatonin	(for men and women)
10. Pregnenolone	(for men and women)
11. Progesterone	(mainly for women, but also important for men)
12. Testosterone	(for men and women)
13. T3 & T4 thyroid hormones	(for men and women)
14. Vitamin D3	(for men and women)

Some important attributes of these hormones:

1. ANDROSTENEDIONE

Androstenedione is one of the androgens / male hormones (the others being testosterone and dhea). It is synthesised from cholesterol like all steroid hormones. Usually, when faced with male sex hormone deficiencies we concentrate on replenishing testosterone, DHEA and pregnenolone.

2. DHEA

DHEA is a hormone made by the adrenal glands and is the precursor of the other sex hormones. A small amount is made by the brain and skin. DHEA production declines with age, starting in the late 20s. By age 70 only about ¼ of your previous levels of DHEA are produced.

Functions of DHEA:

a) helps you deal with stress
b) supports your immune system
c) increases bone growth
d) promotes weight loss
e) decreases cholesterol and fatty deposits
f) increases brain function
g) helps your body repair itself and maintain tissues
h) decreases allergic reactions

Remember that hormones influence each other and a balanced symphony of hormones is essential. For example, insulin resistance or raised insulin influences the synthesis of testosterone and the metabolism of DHEA. Testosterone synthesis increases and DHEA is depleted because elevated insulin increases the activity of an enzyme 17,20–lyase which converts more DHEA to cortisol and testosterone.

3. ESTRADIOL

The body makes three main oestrogens:

1. Estrone E1. Many researchers believe it may be related to an increase in breast and uterine cancer
2. Estradiol E2. The most potent oestrogen maintaining memory, bone health, and aids in protecting you from heart disease
3. Estriol E3. Considerable evidence suggests that estriol protects against breast cancer

Estradiol is 12 times stronger than estrone and 80 times stronger than estriol. Too high levels of estradiol are associated with breast and uterine cancer. There are over 400 functions of oestrogen in your body. These are the main functions of estradiol:

1. increases HDL, lowers LDL, decreases total cholesterol, decreases triglycerides
2. decreases platelet stickiness
3. increases growth hormone
4. increases serotonin
5. increases endorphins
6. improves sleep
7. helps maintain memory
8. helps absorption of magnesium, calcium and zinc

We usually use estradiol in lower concentrations than estriol in a cream like Bi-est cream. The reason we use oestrogen cream more readily than oral oestrogen is due to the following that may occur with oral oestrogen (not with transdermal delivery):

1. increase in blood pressure
2. increase in triglycerides
3. increase estrone E1
4. cause gallstones
5. can elevate liver enzymes
6. can decrease growth hormone (the hormone that keeps you youthful) increases SHBG (sex hormone binding globulin), can decrease testosterone
7. increases weight gain
8. increases carbohydrate craving
9. increased blood clotting factors and increased risk of thrombosis

If you are going to use oral oestrogen it is suggested to use the lowest possible dose. For the reasons listed above, long term replenishment of oestrogen deficiency is safer using the transdermal route. The risk/benefit ratio of replenishing oestrogen this way is superior to oral delivery. The trend in America is to no longer use Tri-est containing estrone which is known to elevate cancer risk, but rather to use Bi-est in varying concentrations. But Tri-est is still used by some and I consider it safer than conjugated oestrogen, progestins and synthetic estrogens.

The following should be noted about the use of bio-identical creams:

1. They are regulated by the medicines control council.
2. It is not necessary to have them registered at the medicine controls council, since registration is only required for mass production of a drug by a pharmaceutical company for mass distribution
3. Bio-identical hormone replacement is not "one size fits all" medicine. It is individualised, personalised, customised dosing for the particular needs of a specific patient
4. The stability of the hormones we use is tested by independent laboratories
5. We check the efficacy by assessing a patient's clinical improvement in symptoms and we can also check levels of hormones by doing the following:
    a. In blood tests there are limitations since these hormones are fat soluble and "prefer" to be in the tissues than the blood. However ratios of the hormones for example oestrogen:progesterone or oestrogen:testosterone can be assessed in the bloods
    b. Urine metabolite testing, readily available at laboratories like age diagnostic labs (not available in SA yet, but hopefully soon will be). It is possible to send off specimens to Australia, UK, USA for analysis
    c. saliva testing is becoming more popular abroad due to the true tissue level reflection
6. When using hormones like oestrogen it is highly recommended to assist the body to metabolise oestrogen to the healthy 2 hydroxyestrone rather than the potentially dangerous 16 or 4 hydroxyestrone. This can be done by supplementing with:
    a. indole-3-carbinol or DIM. Daily dose recommended is 200 to 300mg
    b. moderate exercise
    c. cruciferous vegetables
    d. flax, soy, high protein diet, omega 3, b6, b12 and folate

4. ESTRIOL

Considerable evidence suggests estriol has a cancer-protective effect. **Estriol is a safer form of oestrogen in regard to breast cancer, for these reasons:**

1. In vitro, when given with estradiol, estriol accelerates the removal of estradiol bound to protein receptors
2. Investigators have been able to initiate very little carcinogenesis in animal studies unless using extremely high doses (200-500ug/kg/day)
3. Metabolism of estriol does not result in carcinogenic substances.
   Reference: Lemmon HM; Pathophysiologic consideration in the treatment of menopausal patients with oestrogens; the role of estriol in the prevention of mammary carcinoma; Acta Endocrinol (copenh) 1980; 223:S17-S27)

Functions include:

a) menopausal symptom relief eg. hot flashes, insomnia, vaginal dryness
b) benefits the vaginal lining
c) helps reduce pathogenic bacteria and helps maintain healthy gut flora (lactobacilli)
d) helps restore the proper ph of the vagina
e) has been used to treat breast cancer
f) blocks estrone by occupying the oestrogen receptor sites on breast cells
g) increases HDL (good cholesterol)

5. ESTRONE

This is the oestrogen made most in the postmenopausal years. High levels stimulate breast and uterine tissue and many researchers believe it may be related to an increased risk of breast cancer. Estrone is made in your fat cells mostly in the postmenopausal years. Pre-menopausally it can be converted to estradiol in your ovaries, but postmenopausally, little estrone becomes estradiol since the ovaries have stopped working. Therefore the fatter one is the more estrone one makes. Also, alcohol consumption decreases ovarian hormone production and shifts your oestrogen production to estrone, which increases the cancer risk.

Advantages of bio-identical oestrogens over conventional HRT:

1. Topical administration versus oral has distinct advantages listed before (eg no increase in clotting factors resulting in potential DVT, pulmonary emboli, stroke and coronary thrombosis in elderly women
2. Bio-identical progesterone works differently to synthetic progestins. It is true that progestins have uterine / endometrial protection but they increase the risk for heart disease due to coronary vasospasm and increase the risk for breast cancer. Progestins also have a lot of side effects not seen with naturally produced and supplemented progesterone. (See progesterone section)
3. Estriol may be protective against breast cancer
4. Bi-est transdermally is the safest way to replenish oestrogen
5. Individualised dosing is accomplished using bio-identical hormones. One size does not fit all
6. Incorporation of the hormones into a liposomal gel is a highly effective way of ensuring transdermal systemic absorption.

Some hormonal and other therapies for breast cancer survivors

Estriol is the protective oestrogen (also high during pregnancy). It does not activate the oestrogen receptor, but occupies the receptor site so that it is not available for estradiol. Balancing of hormones is essential and testing prior to supplementation is essential. Careful monitoring is obviously essential.

Here are some suggestions:

…Estriol 2mg twice daily
…Progesterone down-regulates the oestrogen receptors in breast and uterine tissues
…Testosterone has been reported to have an anti-carcinogenic effect on breast cancer cells and in some studies there is an increased survival rate using testosterone
…Aromatase inhibitors like Arimidex, Chrysin and Quercetin can prevent conversion of testosterone to estradiol and prevent conversion of androstenedione to estrone.
…Indole 3 carbinol (I3C) prevents conversion of 2 hydroxyestrone to the carcinogenic 16 and 4 hydroxyestrone

Drug therapy recommendations for high risk breast cancer patients

High risk includes previous breast cancer, 2 family members having breast cancer, young menarche (younger than 11), early menopause (younger than 45), obesity, alcohol abuse, etc. High risk patients should consider the following:

a) High dose estriol:estradiol supplementation (for example 90%:10%)
b) Progesterone
c) Indole-3-carbinol or DIM
d) Melatonin
e) Coenzyme Q10

6. HUMAN GROWTH HORMONE

Traditionally we replace growth hormone last, ie we first ensure all other hormone levels are normal before considering growth hormone supplementation.

Growth hormone benefits for the body:

1. Cognitive benefits
2. Immune function improvement
3. Cardiovascular function improvement
4. Improvement in body composition. As we age we lose protein/muscle mass and gain fat mass. Growth hormone reverses this since it is anabolic and lipolytic.
5. Improved outcomes in traumatic brain injury
6. Anti-aging effects on the skin

There are many advantages attributed to growth hormone in adult growth hormone-deficient individuals. In fact, entire books are written on this hormone alone. We replace growth hormone by a daily subcutaneous injection. There are also secretagogues available that are a combination of amino acids, which enhance your own pituitary production of growth hormone.

7. CORTISOL

Cortisol is the only hormone in your body that increases with age. The premature aging that occurs with increased cortisol (a stress hormone produced by your adrenal glands, but essential for life) is well described in the literature.

Two circumstances make high levels of cortisol unhealthy:

a) Long-term, chronically raised cortisol
b) Deficiencies in cortisol's antagonistic hormones such as growth hormone, testosterone (in men), DHEA, estradiol

Careful avoidance of these two conditions may prevent most, if not all, aging effects attributable to cortisol. Excessive cortisol production can be suppressed with Stress Damage Control™

8. INSULIN

Insulin is the main hormone that regulates your blood sugar (other important hormones being oestrogen, progesterone, DHEA, thyroid, etc). If you become unresponsive to insulin (insulin resistant), your blood sugar will rise and you will develop type 2 diabetes.

The following increase insulin levels:

a) high carbohydrate diet
b) increased stress
c) decreased oestrogen
d) increased testosterone
e) insomnia
f) increased DHEA
g) decreased thyroid hormone
h) excessive progesterone
i) lack of exercise

From an anti-aging point of view we like to have optimal youthful levels of most hormones (in other words higher levels than postmenopausal or other pausal values) The exceptions to this rule are: cortisol, insulin and adrenalin. If these hormone levels are high, aging is accelerated, so ideally we try to keep our fasting insulin levels below 5 and our stress hormones (cortisol and adrenaline) down.

9. MELATONIN

Melatonin is a hormone made in the pineal gland of the brain. This hormone sets your 24hr body cycle. Melatonin is made from the amino acid tryptophan, which is also used to make serotonin. Therefore when melatonin goes up, serotonin goes down. If you eat too many high glycaemic carbohydrates you will make less melatonin and more serotonin.

Melatonin influences the following:

a) sleep
b) mood
c) stress response
d) release of sex hormones
e) antioxidant stronger than vitamin c and e
f) blocks oestrogen from binding to receptors and helps prevent cancer
g) stimulates the parathyroid gland which regulates bone formation
h) stimulates the production of growth hormone
i) decreases cortisol
j) increases the action of benzodiasepines (sleeping pills and tranquilizers)

10. PREGNENOLONE

Pregnenolone is a steroid hormone made in your adrenal glands and is the precursor to DHEA, cortisol and the sex hormones. Your body synthesises this hormone from cholesterol and it is often referred to as the “mother of all steroid hormones”. From ages 35 to 75, most people have a 65% decline in pregnenolone.

Functions:

a) increases resistance to stress
b) improves energy both physically and mentally
c) enhances nerve transmission and memory
d) reduces pain and inflammation
e) blocks the production of acid – forming compounds
f) regulates excitatory/inhibitory balance in the nervous system

Pregnenolone is used in the treatment of arthritis, depression, memory loss, fatigue and moodiness.

11. PROGESTERONE

Progesterone is one of the sex hormones made in the ovaries before menopause. After menopause some progesterone is made in your adrenal glands. Progestin (synthetic progesterone) is not progesterone. Only progesterone is bio-identical.

Side effects of progestins include:

Increased appetite, weight gain, fluid retention, depression, irritability, headaches, decreased energy, bloating, breast tenderness, decreased sexual interest, acne, hair loss, insomnia, breakthrough bleeding, spotting, stops the protective effects estrogen has on your heart, increases LDL (bad cholesterol), decreases hdl (good cholesterol, protects only the uterus from cancer). Also, progestins do not prevent vasospasm (an effect opposite to progesterone).

In contrast, the following benefits are seen with progesterone - and not with progestins:
a) Improved sleep
b) Helps balance oestrogen
c) Natural calming effect
d) May protect against breast cancer
e) Increases scalp hair
f) Lowers cholesterol
g) Lowers high blood pressure
h) Helps balance fluids in cells
i) Increases the beneficial effects of oestrogens on blood vessel dilation in atherosclerotic plaques
j) Leaves your body much quicker than progestins, not wasting energy
k) Natural antidepressant
l) Increases metabolic rate
m) Natural diuretic
n) Has an anti-proliferative effect. Decreases the rate of cancer on all progesterone receptors, not just the uterus
0) Does not change the good effect oestrogen has on blood flow. Progestins cause coronary spasm and increase the risk for heart disease. Progesterone does not.

Progesterone is a truly wonderful hormone in its natural form. It makes no sense to change its structure to a progestin and expect the same good effects. The side effects of progestins are actually progesterone deficiency. This is because progestins bind to progesterone receptors and inhibit progesterone from binding to its receptor sites. Methods of delivery: oral micronised progesterone and transdermal cream (eg 3, 5 or 10% cream).

12. TESTOSTERONE

Androgens are often called “male hormones”. They are testosterone, DHEA and androstenedione. Testosterone is made in the adrenal glands and ovaries. It is important to measure both free and bound testosterone since only about 1% is free, the rest is bound to SHBG (sex hormone binding globulin) which carries the testosterone in your blood.

Testosterone has a myriad of functions in the human body:
a) motivation, emotional well being, self-confidence
b) increases muscle mass and strength
c) increases sexual interest
d) helps maintain memory
e) helps maintain bone strength
f) decreases excessive body fat
g) increases muscle tone so your skin does not sag.

Ways to supplement:
Natural testosterone is the preferred method. Methyltestosterone (synthetic) has been suggested to be carcinogenic to the liver. Natural testosterone is effective as a pill or a cream. Rotation of site of application is important to prevent hair growth. Also remember the skin has an enzyme, aromatase, which can change the testosterone applied to estradiol. Natural aromatase inhibitors include quercetinc, progesterone and chrysin. There are natural treatments like nettle root that also increase the free testosterone from SHBG mentioned earlier. Injectable testosterone is also available (mostly used in andropause).

13. THYROID HORMONES

The thyroid hormones (eltroxin/T4 and tertroxin/T3) control the rate that your body burns fuel. These two hormones are necessary in infants for the normal development of the central nervous system, in children for skeletal growth, and in adults for normal function of other organs and systems. Thyroid hormones also affect tissue growth and maturation, help regulate fat digestion, and increase intestinal absorption of carbohydrates. Typically thyropause (lowering of thyroid functioning) occurs between the ages of 30 and 40, but even more frequently at age 50.

The importance of T3 and T4 and TSH (thyroid stimulating hormone from the pituitary) needs to be looked at differently to the way most doctors are taught. A partial deficiency in thyroid hormones allows life, but is a life often miserable with complaints and physical signs typical for the disease. One of the most important consequences of thyroid hormone deficiency is a decrease in the production of most other important hormones such as growth hormone, testosterone, female sex hormones, cortisol, DHEA, etc. This polyhormonal induced senescence is reversed with thyroid hormone treatment.

The best thyroid deficiency treatment should include both T4 and its more active metabolite T3.

14. VITAMIN D3

Vitamin D3 and calcium aid in bone health

According to the *Journal of Public Health*, increasing vitamin D intake may help lower the risk of breast cancer, colon cancer, skin cancer, prostate and ovarian cancer by as much as 50%. Vitamin D has now been shown to decrease insulin resistance, regulate cell production, and modulate immune function. It also prevents and reverses skin damage. As your skin ages, it can no longer synthesise vitamin D from the sun. If you notice your skin is not healing the way it used to, extra vitamin D might be the answer.

Conclusion

Optimising the wonderful symphony of bio-identical hormones is key to optimal health – along with good nutrition, good lifestyle choices and moderate exercise. Mother nature gave us these hormones and for many centuries they have withstood many challenges and the human race has survived. We cannot change the structure of nature's hormones and expect the same effects. In fact, we often see very harmful effects. Countless studies show worse outcomes when the structure of a hormone is changed. Bio-identical replenishment is all about the use of the structurally same hormones found in our own bodies. Ones our immune systems do not perceive as foreign.

-For more information on Bio-Identical Hormones, please contact Solal Technologies

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