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F.A.Q. Troches and Bio-Identical Hormones

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What Is a Troche?

A troche is a French dosage form that dissolves between the upper cheek and gum, allowing the medication to absorb directly into the blood stream. Born out of the need to address the problems associated with other dosage forms, troches were adapted to systemic bio-identical hormone replacement therapy (BHRT) due to their superior absorption, bioavailability, and metabolism.

The Benefits of Using Troches

There are several reasons troches are preferred for BHRT: 1) They are not shunted directly to the liver (avoiding first pass), which protects the liver and gallbladder from damage caused by hormones when swallowed. 2) Eliminating first pass liver metabolism of the hormones prevents some of the most common side effects. 3) Absorption through oral mucosa allows a higher percentage of the desired hormones to reach the blood stream so lower doses can be employed. 4) Multiple hormones can be compounded into one troche, making it possible to receive a full compliment of BHRT in one prescription. 5) The hormones are cleared from the system in 8 to 15 hours, allowing for rapid dosage adjustments. 6) The patient is in control of dosing, which is typically twice daily, 12 hours apart. 7) Troches are dispensed in a convenient purse or pocket pack. *(Note: They are designed to melt at 98.6 degrees Fahrenheit, so it is not advisable to leave them in your hot car, near a heater, or out in the sun!)*
Avoid sucking, chewing, or dissolving the troche under the tongue to assure maximum absorption and to diminish the swallowing of the hormones. If a dose is missed, take the medication as soon as remembered unless it is almost time for the next dose. Do not double up on doses unless otherwise directed by your practitioner.

Other Dosage Forms

Besides troches, dosage forms for hormones include oral tablets and capsules, sublingual lozenges, topical creams and ointments, suppositories, pessaries, injections, implanted pellets, and patches.

Orally ingested hormones, in the form of tablets, capsules, and sublingual lozenges, undergo first pass metabolism as they are directed to the liver. Because of this, only 10% of the hormones reach the blood stream, creating a need for higher dosing. This means 90% of the dose is converted in the liver to other unwanted hormones, causing damage to the liver and gallbladder. Hormone molecules from the first pass effect are the source of many side effects traditionally attributed to hormone replacement therapy, such as high blood pressure, formation of blood clots, reduced insulin growth factor, weight gain, liver formed carcinogenic hormones, gallbladder disease, and more.

Topical applications, in the form of creams and ointments, are difficult to absorb through the skin, though ideal for application to mucous membranes such as those of the vagina and pelvic floor. This is because the skin is a natural protective barrier while mucous membranes are designed to transport a multitude of substances, such as nutrients, macromolecules, and water, into the blood stream. Applied to the skin, hormones undergo change as they pass through to the underlying layer of fat, where an immeasurable amount are converted into unintended steroids. From there, they either enter into the blood stream or become trapped in the fat cells. This spawns unfavorable aftereffects from the steroids and makes it difficult to achieve therapeutic hormone levels. However, when used vaginally or on the pelvic floor, proper formulations achieve systemic absorption and treat localized tissue conditions such as vaginal dryness or atrophy.

Suppositories and pessaries effectively increase systemic hormone levels, but can require a higher dose of medication to accomplish the same blood levels as troches. They are often inconvenient as they make dose cycling and travel difficult due to timing and temperature regulations. For instance, with vaginal use it is necessary to remain horizontal for 20 minutes post insertion to allow absorption of the hormones. Disruption of the vaginal flora, resulting in overgrowth of yeast and other organisms, is a common occurrence with vaginal applications. Rectal dosing can cause flatulence.

Injections, implanted pellets, and patches deliver single hormones and therefore may require multiple hormone prescriptions each month, increasing cost and decreasing convenience. Injections and pellets release high initial doses that fade over time, detrimentally skew the metabolism and blood levels of other hormones, and require a visit to the doctor's office for each administration. Repeated use of injections and implants can cause reactions at the application sites, prohibiting long term use. Once administered or discontinued, the dosage takes days, sometimes weeks, to leave the system, causing a delay in resolution of side effects. Patches have a history of causing dermatitis, becoming dirty, and even falling off pre- maturely, resulting in an interruption of therapy.

What Does "Bio-Identical" Mean?

The terms "bio-identical" and "natural hormone replacement" are used to describe hormones which are derived from plant sources and then converted into human hormone molecules. O'Brien Pharmacy compounds with hormones from wild yams, steering clear of those hormones from genetically modified soy. Commercially made "synthetic" hormones are usually produced from genetically modified soybean oil or the urine of pregnant mares, and are different from our human molecules. They are altered to affect absorption, metabolism, the biological effect of a substance, and to ensure patentability for the monetary gain of the pharmaceutical company. Unfortunately, these goals have resulted in drugs which can cause negative side effects. Bio-identical hormones work to achieve hormone balance without many of these untoward reactions. Our human molecules have specific physiologic functions in our bodies which can not be carried out by synthetic hormones. As an analogy, until the 1980's, the only insulin available for diabetics came from cows or pigs. A huge medical breakthrough was the ability to mass produce bio-identical human insulin. Today, a doctor wouldn't even consider prescribing cow or pig insulin. Similarly, many have turned not only to bio- identical steroid hormones, but also to bio-identical thyroid.

The Six Principles of Using BHRT Most Effectively

1. Use only bio-identical hormones—identical human hormone molecules.
2. Use the safest route of administration—buccal troches. Always avoid first pass through the liver.
3. Preserve the delicate balance—our bodies produce and use many hormones that must work together in specific ratios. Their levels usually fall together. Do not replace just one hormone when several are low.
4. Individualize the dose—symptoms, patient health goals, and lab work should all be considered when formulating a prescription.
5. Eat a diet void of xenobiotics and endocrine disruptors and rich in organic fruits and vegetables—while a healthy diet supports your body's ability to produce and use hormones efficiently, a diet high in endocrine disruptors in the form of pesticides, herbicides, artificial hormones, and xenobiotics negatively affect hormonal balance.
6. Supplement with therapeutic multi-vitamins and minerals, antioxidants, and essential fatty acids—these are the building blocks for the body and support proper hormone utilization, production, and metabolism.

What Are Some Benefits and Considerations of Taking Hormones?

Bio-Identical Progesterone

Progesterone is a hormone made in the bodies of both women and men, though women make much more of it. It is not to be confused with synthetic progestins, such as those found in birth control pills, rings, IUDs, and injections, Prempro® or Provera®, which differ in effects and side effect profiles. Progesterone plays a vital role in energy production, libido, thyroid and cardiac function, bone density, healthy breast and endometrial tissue, blood pressure maintenance, sleep patterns, and mood. Regulation of estrogen distribution across all tissues, relief of hot flashes, protecting against and helping reverse osteoporosis, and protecting against breast and endometrial cancer are all functions of progesterone.

Referred to as the pregnancy hormone, it is created in vast amounts by the ovaries and placenta in order to support the pregnant woman and her fetus, and is often implemented to help with conception and to sustain pregnancies. Postpartum depression, PMS, irregular periods, and menopausal symptoms are all signs of low progesterone and can be addressed with progesterone supplementation. Possible side effects, which should subside with dosage adjustment or body acclamation, are changes in menstrual flow, breakthrough bleeding, spotting, missed periods, breast tenderness and swelling, and dizziness or a "foggy" feeling.

Bio-Identical Estrogen

Though estrogen is thought of as a female hormone, it is produced in both women and men. Bio-identical estrogen refers to the three main estrogenic hormones—estriol, estradiol and estrone—and cannot be confused with conjugated or synthetic estrogens, which are not bio-identical and have different effects and side-effects. In BHRT troches, a combination of estrogens called "tri-est" (triple estrogen) is used, and is typically formulated as 80% estriol and 10% each of estradiol and estrone. This allows for the majority of the estrogenic activity to come from the estriol, which is non-proliferating and the weakest of the three. It also allows the dosage of the stronger two estrogens to be lowered. Furthermore, estrogen must be balanced in specific but customized ratios with other steroid hormones. It is responsible for energy production, libido, maintaining sleep, lowering blood pressure, mood stabilization, cognitive function, cardiac output, slowing the loss of calcium from bones and maintaining bone density, maintaining fat to muscle ratio, maintaining shiny, thick, and strong hair, and producing moisture for the eyes, joints, and mucous membranes. Because estrogen levels decline with age, it is often supplemented throughout peri-menopause and menopause, however, some may require supplementation earlier in life as well, such as in premature ovarian failure, hysterectomy, tubal ligation, or after child birth. Estrogen can relieve symptoms such as hot flashes, irregular periods, vaginal dryness, night sweats, depression, and anxiety. It helps with osteoporosis, reducing the risk of senility and Alzheimer's disease, reducing stress, and increasing the strength of the cardiac muscle. Globally, some estrogens are used in breast and prostate cancer protocols. Possible side effects, which should subside with dosage adjustment or body acclamation, include headache, dizziness, breakthrough bleeding, mood swings, and breast tenderness and swelling.

Bio-Identical DHEA

DHEA (dehydroepiandrosterone) is a hormone primarily produced in the adrenal glands of both women and men. It is a precursor hormone from which other hormones, especially testosterone, are made. Energy production, libido, maintaining blood pressure, sense of well being, cognitive function, building lean muscle mass and minimizing fat, maintaining insulin sensitivity, calcium absorption, activating the immune system, and slowing the aging process are just a few of its functions. It decreases significantly with age and precipitously after hysterectomy, therefore DHEA is typically used in peri- through post- menopausal women as well as andropausal men. DHEA is also utilized in adrenal insufficiency and depression. In men, it can be supplemented for healthy erectile function. Possible side effects, which should subside with dosage adjustment or body acclamation, include mild acne and hirsutism.

Bio-Identical Testosterone

Testosterone, though known to be primarily a male hormone, is also produced to a lesser degree by women. Testosterone levels in men are at an all time low. This is partially due to environmental toxins, such as pesticides and herbicides accumulated in animal products, and partially due to certain medications, including those used in childhood conditions. Low testosterone manifests as low energy, depression, insomnia, weight gain around the mid section, increased cholesterol, male breast development, enlarged prostate, and a higher risk for prostate cancer. Important testosterone physiologic roles are not limited to sexual function and libido, but include maintenance of bone density and lean muscle mass, energy production, mood and well being, cognitive function, maintaining cardiovascular health, lowering blood pressure, maintaining healthy cholesterol levels, weight control, maintaining sleep patterns, and maintaining a healthy prostate. While commonly supplemented in middle age, it can also be used earlier in life. Possible side effects, which should subside with dosage adjustment or body acclamation, include excessive hair growth, hair loss, acne, aggressiveness, increased blood cell count, and water retention.

Bio-Identical Pregnenolone

Pregnenolone is the first hormone produced from cholesterol by both women and men. It's a precursor hormone to all other steroid molecules. Pregnenolone's actions in the body include collagen formation, maintaining healthy fat to

muscle ratio, maintaining bone density, energy production, antioxidant action, stabilization of mood, and cognitive function. A study on psychological fatigue demonstrated the use of pregnenolone for cognitive function in sleep deprived pilots, improving their target accuracy by 50%. Its anti-inflammatory properties have triggered the successful use of pregnenolone in rheumatoid arthritis, allergies, and other inflammatory states. This anti-inflammatory activity is second only to cortisol, except it displays anabolic properties rather than catabolic, giving pregnenolone a much lower side effect profile than steroids such as prednisone. These anabolic properties have made pregnenolone very useful in cachexia patients. Facilitating the weaning from synthetic steroids, such as prednisone, has been one of pregnenolone's greatest services. It decreases with age and is sometimes supplemented in those who are peri- through post- menopausal as well as andropausal, especially in those with auto-immune or other inflammatory diseases. Rare but possible side effects, which usually dissipate with dosage adjustment or body acclamation, include anxiety, irritability, increased appetite, seizures, and heart palpitations.

Bio-Identical Thyroid

Thyroid hormone plays an integral role in metabolism, energy production, regulation of cholesterol, maintaining body temperature, and hormone production and utilization. Thyroid is produced in our bodies in two forms: active T3 and the less active storage form, T4. Synthetic preparations, available as Synthroid® and Euthroid-1® for T4, or Cytomel® for T3, work for some patients, however, others need a more customized formulation. "Natural" thyroid, such as Armour® and Nature-Throid®, contain porcine T4 and T3 in a 4 to 1 ratio. They are derived from conventionally raised pigs whose thyroid is dried, ground, and made into tablets. This, too, has worked for some, but for others, problems arise. Empirically, practitioners have reported increasing numbers of cases in which TPOs and antithyroglobulin antibodies in patients taking porcine thyroid are elevated, indicating a worsening of Hashimoto's thyroiditis, and in some people, the development of Hashimoto's when their hypothyroidism was never due to autoimmune disease. This has necessitated repetitive increases in dosage to maintain treatment. In addition, pork is appearing more frequently on food sensitivity tests of patients taking porcine thyroid. As with other food sensitivities, researchers believe this is happening because of the exposure of genetically modified organisms, pesticides, and herbicides, along with high levels of antibiotics and other drugs found in the thyroid glands of these conventionally raised pigs. Compounded bio-identical thyroid can remedy many issues of other forms of thyroid supplementation because it is made with the same ingredients as those used by our bodies and provides the opportunity to offer more customized ratios and strengths. Besides immediate release capsules, it can be compounded into sustained release capsules for those sensitive to the effects of receiving thyroid too rapidly. Possible side effects of all thyroid medications, which should resolve with dosage adjustment or body acclamation, are not limited to but may include anxiety, heart palpitations, diarrhea, sleeplessness, hypertension, increased perspiration, and weight loss.

Where Can I Find More Information?

Our pharmacists are happy to answer questions regarding BHRT. More in-depth consultations with our clinical pharmacists are available by appointment.

References

Williams Textbook of Endocrinology: 1981 through 2016. Editions 5-13

Dalton K. 1971 Jun. Prospective study into puerperal depression. Br J Psychiatry. 118(547): 689-92

Dalton K. 1971 Dec. Puerperal and premenstrual depression. Proc R Soc Med. 64(12): 1249-52

Lyytinen H, Pukkala E, Ylikorkala O. 2006 Dec. Breast cancer risk in postmenopausal women using estrogen-only therapy. Obstetrics and Gynecology. 108(6): 1354-60

Terauchi M, Obayashi S, Aso T. 2006. Estriol, conjugated equine estrogens, and alendronate therapy for osteoporosis. Int J Gynaecol Obstet. 92: 141-41

Fournier A, Berrino F, Riboli E, Avenel V, Clavel-Chapelon F. 2005 Apr 10. Breast cancer risk in relation to different types of hormone replacement therapy in the E3n-EPIC cohort. Int J Cancer. 114(3): 448-54

Hecter O, Grossman A, Chatterton RT. 1997. Relationship of dehydroepiandrosterone and cortisol in disease. Medical Hypothesis. 49: 85-91

Phillips GB, et al. 1994 May. The association of hypotestosteronemia with coronary artery disease in men. Arterioscler Thromb. 14(5): 701-06

Tenover J. 1992. Effects of testosterone supplementation in the aging male. J Clin Endocrinol Metab. 1092-98

Foundeur M, Fixsen C, Triebel WA, White MA. 1957 May. Postpartum mental illness; a controlled study. Arch Neurol Psychiatry. 77(5): 503-12

Pitt B. 1968 Nov. "Atypical" depression following childbirth. Br J Psychiatry. 114(516): 1325-35

Hegarty AB. 1995 Mar 12. Post-puerperal reoccurent depression. Brit Med J. 1(4914): 637-40

Csapa A, Pahanka O, Kaihola LH. 1973. Progesterone deficiency and premature labour. Lancet. (ii): 1097. Repub 1974. Br Med J. 1:137-40

Jones GS. 1983. The historic review of the clinical use of progesterone and progestin. In: Bardin CW, Milgrom E, Borst SE, et al. 2010 Feb. Testosterone administration induces protection against global myocardial ischemia. Horm Metab Res. 42(2): 122-29

Morgentaler A. 2011 Sep. Turning conventional wisdom upside-down: low serum testosterone and high-risk prostate cancer. Cancer. 117(17): 3885-88
Howell A, Evans GD. 2011. Hormone replacement therapy and breast cancer. Recent Results Cancer Res. 188: 115-24

Lonning PE, Taylor PD, Anker G, Iddon J, Wie L, Jorgensen LM, Mella O, Howell A. 2001 May. High-dose estrogen treatment in postmenopausal breast cancer patients heavily exposed to endocrine therapy. Breast Cancer Res Treat. 67(2): 111-16

Ingle JN. 2002 May 15. Estrogen as therapy for breast cancer. Breast Cancer Res. 4(4): 133-36

Bourque M, Dluzen DE, Di Paolo T. 2009 Jul. Neuroprotective actions of sex steroids in Parkinson's disease. Front Neuroendocrinol. 30(2): 142-57

Morinaga A, Ono K, Takasaki J, Ikeda T, Hirohata M, Yamada M. 2011 Jan 31. Effects of sex hormones on Alzheimer's disease-associated β-amyloid oligomer formation in vitro. Exp Neurol. 228(2): 298-302

Seifert-Klauss V, Prior JC. 2010. Progesterone and bone: actions promoting bone health in women. J Osteoporos. 2010: 845180

Tellez N, Comabella M, Julia E, Rio J, Tintore M, Brieva L, Nos C, Montalban X. 2006 Aug. Fatigue in progressive multiple sclerosis is associated with low levels of dehydroepiandrosterone. Mult Scler. 12(4): 487-94

Komesaroff PA, Black CV, Westerman RA. 1998. A novel, nongeonomic action of estrogen on the cardiovascular system. J Clin Endocrine Metab. 83: 2313-16

Dubey RK, Jackson EK, Gillespie DG, et al. 2000. Clinically used estrogens differentially inhibit human aortic smooth muscle cell growth and mitogen-activated protein kinase activity. Arterioscler Thromb Vasc Biol. 20: 964-72

Lundstrom E, Wilczek B, von Palffy Z, et al. 2001. Mammographic breast density during hormone replacement therapy: effects of continuous combination, unopposed transdermal and low potency estrogen regimens. Climacteric. 4: 42-48

Lipworth L, Adami HO, Trichopoulos D, et al. 1996. Serum steroid hormone levels, sex hormone-binding globulin, and body mass index in the etiology of postmenopausal breast cancer. Epidemiology. 7: 96-100

Lemon H. 1973 Mar 10. Oestriol and prevention of breast cancer. Lancet. 1(7802): 546-47

Lemon H. 1980. Pathophysiologic considerations in the treatment of menopausal patients with oestrogens; the role of oestriol in the prevention of mammary carcinoma. Act Endocrine Suppl (Copenh). 233: 17-27

Leonetti HB, Longo S, Anasti JN. 1999 Aug. Transdermal progesterone cream for vasomotor symptoms and postmenopausal bone loss. Obstet Gynecol. 94(2): 225-28

Cicinelli E, Petruzzi D, Scorcia P, Resta L. 1993 Dec. Effects of progesterone administered by nasal spray on the human postmenopausal endometrium. Maturitas. 18(1): 65-72

The writing group for the PEPI Trial [no authors listed]. 1995 Jan 18. Effects of estrogen or estrogen/progestin regimens on heart disease risk factors in postmenopausal women. The Postmenopausal Estrogen/Progestin Interventions (PEPI) Trial. JAMA. 273(3): 199-208

Fitzpatrick LA, Pace C, Wiita B. 2000 May. Comparison of regimens containing oral micronized progesterone or medroxyprogesterone acetate on quality of life in postmenopausal women: a cross-sectional survey. J Womens Health Gend Based Med. 9(4): 381-87

Rosano GM, Webb CM, Chierchia S, Morgani GL, Gabraele M, Sarrel PM, deZiegler D, Collins P. 2000 Dec. Natural progesterone, but not medroxyprogesterone acetate, enhances the beneficial effect of estrogen on exercise-induced myocardial ischemia in postmenopausal women. J Am Coll Cardiol. 36(7): 2154-59

Miyagawa K, Rosch J, Stanczyk F, Hermsmeyer K. 1997 Mar. Medroxy-progesterone interferes with ovarian steroid protection against coronary vasospasm. Nat Med. 3(3): 324-27

Hargrove JT, Maxson WS, Wentz AC, Burnett LS. 1989 Apr. Menopausal hormone replacement therapy with continuous daily oral micronized estradiol and progesterone. Obstet Gynecol. 73(4): 606-12

Giuliani A, Concin H, Wieser F, Boritsch J, Wilfert H, Gruber D, Urdl W. 2000 Jul 28. [Hormone replacement therapy with a transdermal estradiol gel and oral micronized progesterone. Effect on menopausal symptoms and lipid metabolism] (Article in German). Wien Klin Wochenschr. 112(14): 629-33

deLignieres B, Dennerstein L, Backstrom T. 1995 Apr. Influence of route of administration on progesterone metabolism. Maturitas. 21(3): 251-57

Corson SL. 1993 Mar-Apr. A decade of experience with transdermal estrogen replacement therapy: overview of key pharmacologic and clinical findings. Int J Fertile. 38(2): 79-91

Yang TS, Tsan SH, Chang SP, Ng HT. 1995 May. Efficacy and safety of estriol replacement therapy for climacteric women. Zhonghua Yi Xue Zazhi (Taipei). 55(5): 386-91

Rylance PB, Brincat M, Lafferty K, DeTrafford JC, Brincat S, Parsons V, Studd JW. 1985 Jan 5. Natural progesterone and antihypertensive action. Br Med J (Clin Res Ed). 290(6461): 13-14

Glasnapp A. 2000 Mar/April. Natural estrogens: a review of the primary literature. Intl J Pharm Compounding. 4(2): 110-13

Wagner JD. 2000 Mar. Rationale for hormone replacement therapy in atherosclerosis prevention. J Reprod Med. 45(3 Suppl): 245-58

Crook D. 1997. The metabolic consequences of treating postmenopausal women with non oral hormone replacement therapy. Br J Obstet Gynaecol. 104(6): S4-13

Ettinger B, Genant H, Cann C. 1985. Late term estrogen replacement therapy prevents bone loss and fractures. Ann Intern Med. 102: 319-24

Pincus G, Hoagland H. 1944. Effects of administered pregnenolone on fatiguing psychomotor performance. J Aviation Med 15: 98-115

Scarabin PY, Alhenc-Gelas M, Plu-Bureau G, Taisne P, Agher R, Aiach M. 1997 Nov 17. Effects of oral and transdermal estrogen/progesterone regimens on blood coagulation and fibrinolysis in postmenopausal women: a randomized controlled trial. Arterioscler Thromb Vas Biol. (11): 3071-18

Koh K, Mincemoyer R, Bui M, Csako G, Pucino F, Guetta V, Waclawiw M, Cannon R. 1997 March 6. Effects of hormone-replacement therapy on fibrinolysis in postmenopausal women. N Engl J Med. 336: 683-91

Campagnoli C, Clavel-Chapelon F, Kaaks R, Peris C, Berrino F. 2005. Progestins and progesterone in hormone replacement therapy and the risk of breast cancer. J Steroid Biochem Mol Biol. 96(2): 95-108
Silva I, Mor G, Naftolin F. 2001. Estrogen and the aging brain. Maturitas. 38: 95-100

deLignieres B, de Vathaire F, Fournier S, Urbinelli R, Allaert F, Le MG, Kuttenn F. 2002. Combined hormone replacement therapy and risk of breast cancer in a French cohort study of 3175 women. Climacteric. 5(4): 332-40

Vasconsuelo A, Milanesi L, Boland R. 2013 Sep. Actions of 17β-estradiol and testosterone in the mitochondria and their implications in aging. Aging Res Rev. 12(4): 907-17

Khaw KT, Dowsett M, Folkerd E, et al. 2007 Dec 4. Endogenous testosterone and mortality due to all causes, cardiovascular disease, and cancer in men: European prospective investigation into cancer in Norfolk (EPIC- Norfolk) Prospective Population Study. Circulation. 116(23): 2694-701

Raynaud JP. 2006 Dec. Prostate cancer risk in testosterone treated men. Steroid Biochem Mol Biol. 102(1-5): 261-66

Modena MG, Molinari R, Muia Jr. N, Castelli A, Pala F, Rossi R. 1999 Oct 12. Double-blind randomized placebo-controlled study of transdermal estrogen replacement therapy on hypertensive postmenopausal women.
Am J Hypertens. (10 Pt1): 1000-008

Dubey RK, Gillespie DG, Jackson EK, Keller PJ. 1998 Jan. 17Beta-estradiol, its metabolites, and progesterone inhibit cardiac fibroblast growth. Hypertension. 31(1 Pt2): 522-28

Lemon H. 1975 May. Estriol prevention of mammary carcinoma induced by 7,12-dimethylbenzanthracene and procarbazine. Can Res. 35(5): 1341-353

Dessole S, Rubattu G, Ambrosini G, Gallo O, Capobianco G, Cherchi PL, Marci R, Cosmi E. 2004 Jan-Feb. Efficacy of low-dose intravaginal estriol on urogenital aging in postmenopausal women. Menopause. 11(1): 49-56

Mayo Clinic. 1999 Aug. "Women prefer the use of natural progesterone over synthetic progestins. Natural progesterone made a difference in overall quality of life, menopausal symptoms, and satisfaction." Women's HealthSource. Pg 3

Montgomery B, Nelson P, Vessella R, Kalhorn T, Hess D, Corey E. 2010 May 28. Estradiol suppresses tissue androgens and prostate cancer growth in castration resistant prostate cancer. BMC Cancer. 10: 244

Kopper N, Gudeman J, Thompson D. 2009 Feb. 6. Transdermal hormone therapy in postmenopausal women: a review of metabolic effects and drug delivery technologies. Drug Des Devel Ther. 2008. [accessed 2017 May 17]; 2: 193-20 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2761184

Oakes, K. 2017 April 4. Bioidentical hormone replacement fares well in phase III trial. Family Practice News. [accessed 2017 May 31]; www.mdedge.com

Dalton K. 1999. Once a month: understanding and treating PMS. 6th ed. Hunter House

Morgenthaler J, Wright J. 1997. Natural hormone replacement for women over 45. Smart Publications

Northrup C. 2010. Women's bodies, women's wisdom: creating physical and emotional health and healing. Rev ed. Bantum
Cabot S. 1995. Smart medicine for menopause: hormone replacement therapy and its natural alternatives. Avery Publishing Group

Vliet EL. 2000. Screaming to be heard: hormonal connections women suspect, and doctors still ignore. Rev ed. M. Evans & Company

Rako S. 1999. The hormone of desire: the truth about testosterone, sexuality, and menopause. Harmony

Lee JR, Hopkins V. 1996. What your doctor may not tell you about menopause: the breakthrough book on natural progesterone. Warner Books

Andersen A. 2017. Food plague-could our daily bread be our most life threatening exposure? Rev ed. Holographic Health Press

Gaby A. 1995. Preventing and reversing osteoporosis: what you can do about bone loss - a leading expert's natural approach to increasing bone mass. Harmony

Sahelian R. 1996. DHEA: a practical guide. Avery

Sahelian R. 1997. Pregnenolone: nature's feel good hormone. Avery

Seaman B. 1995. The doctor's case against the pill: 25th anniversary. 25th anv. ed. Hunter House
Robbins J. 1987. Diet for a new America. HJ Kramer

Dalton K. 2001. Depression after childbirth: how to recognize, treat, and prevent postnatal depression. Holton W (contributor). 4th ed. Oxford University Press

Barkin C, Milgram E, Mauvais-Jarvis P, editors. 1983. Progesterone and progestins. Raven Press