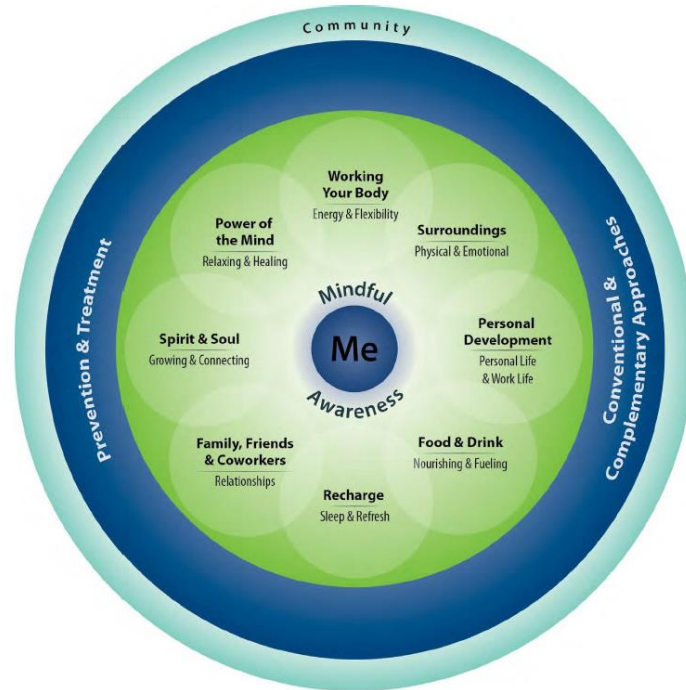


WHOLE HEALTH: CHANGE THE CONVERSATION

Advancing Skills in the Delivery of
Personalized, Proactive, Patient-Driven Care

Estrogen Dominance Clinical Tool



This document has been written for clinicians. The content was developed by the Integrative Medicine Program, Department of Family Medicine, University of Wisconsin-Madison School of Medicine and Public Health in cooperation with Pacific Institute for Research and Evaluation, under contract to the Office of Patient Centered Care and Cultural Transformation, Veterans Health Administration.

Information is organized according to the diagram above, the *Components of Proactive Health and Well-Being*. While conventional treatments may be covered to some degree, the focus is on other areas of Whole Health that are less likely to be covered elsewhere and may be less familiar to most readers. There is no intention to dismiss what conventional care has to offer. Rather, you are encouraged to learn more about other approaches and how they may be used to complement conventional care. The ultimate decision to use a given approach should be based on many factors, including patient preferences, clinician comfort level, efficacy data, safety, and accessibility. No one approach is right for everyone; personalizing care is of fundamental importance.

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Estrogen dominance is the condition of increased estrogen levels relative to progesterone levels in the body. Estrogen dominance may be the result of overproduction of estrogen by the body, changes in estrogen metabolism and excretion, or an imbalance in the estrogen to progesterone ratio. Many conditions are thought to be associated with or exacerbated by estrogen dominance, including breast and uterine cancers, fibroids, endometriosis, and polycystic ovarian syndrome.

The body makes three main estrogens:

- Estrone (E1)
- Estradiol (E2)
- Estriol (E3)

Estrone (E1) is the main type of estrogen present in the body after menopause, made primarily in adipose tissue. Estradiol (E2) is the strongest estrogen, made by the ovaries and present in the body before menopause. Estriol (E3) is the weakest estrogen, present in the body primarily during pregnancy.

The body has two main receptors to which estrogen binds: alpha receptors that promote cell growth and beta receptors that inhibit cell growth. Estrone (E1) activates alpha receptors in a 5:1 ratio, increasing cell proliferation. Estradiol (E2) equally binds both alpha and beta receptors. Estriol (E3) binds beta receptors in a 3:1 ratio, inhibiting cell proliferation.¹ Because of this pattern, some believe that estriol (E3) may actually protect against cell growth associated with breast cancer, although research is still preliminary.

Besides the direct effects of estrogen in the body, its metabolites are also important. Estrogen is broken down along two major pathways, into 2-hydroxyestrone and into 16-hydroxyestrone. Each of these metabolites has distinct functions in the body. 2-Hydroxyestrone has multiple health benefits, working to block stronger estrogens that promote cell proliferation and possible cancer growth. Conversely, 16-hydroxyestrone increases cell proliferation. Higher levels of 16-hydroxyestrone are associated with inflammation, excess levels of omega-6 fatty acids, obesity, hypothyroidism, and pesticide toxicity.² A decreased ratio of 2:16 hydroxyestrones has been associated with breast cancer and lupus.³ A small amount of estrogen is metabolized to 4-hydroxyestrone, which is thought to promote cancer by damaging DNA. (Figure 1 outlines how estrogens fit into the steroid metabolism pathway.)

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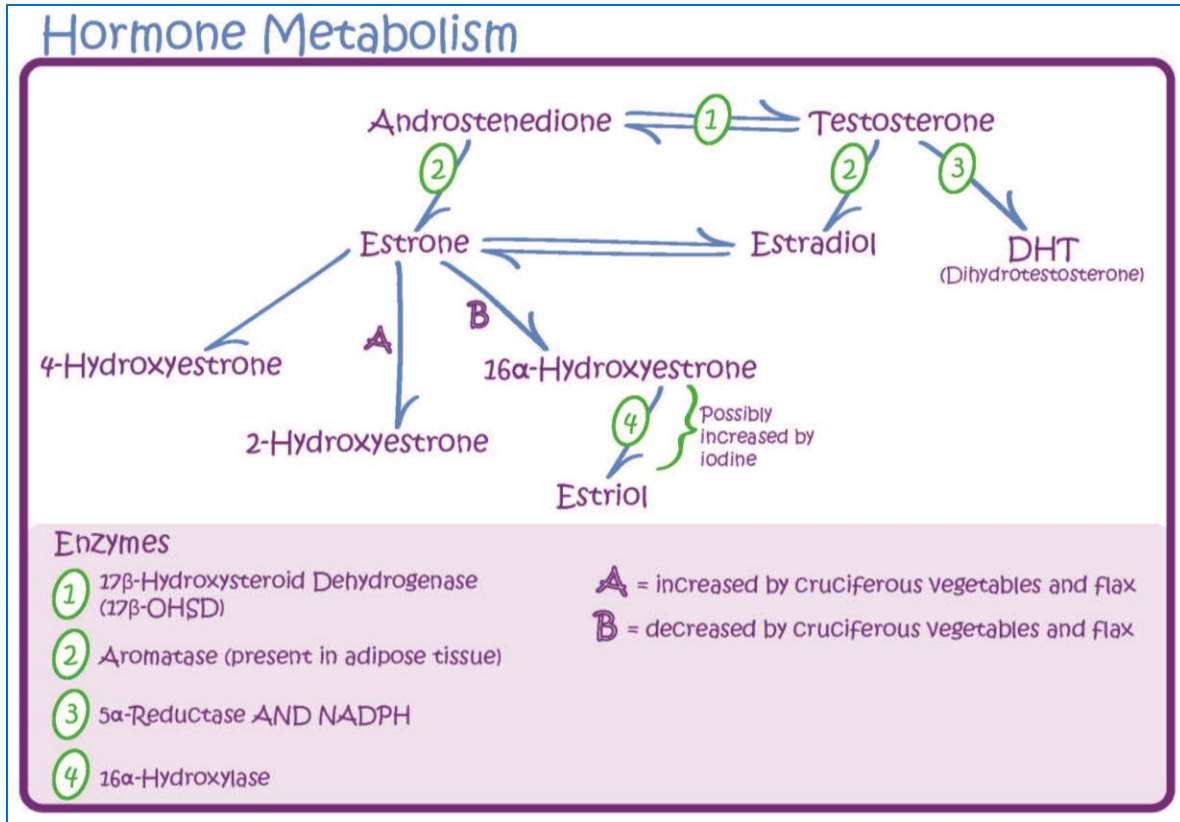


Figure 1. Estrogen and the Steroid Metabolism Pathway.

For these reasons, a healthy estrogen balance favoring production of 2-hydroxyestrone is important for women's health. Although lab testing can determine a women's estrogen ratio, testing is likely unnecessary for most women. Women with an increased risk of estrogen-sensitive conditions and who have behaviors that promote estrogen dominance should be counseled in healthy lifestyle changes. The following have been shown to shift estrogen metabolism toward the 2-hydroxyestrone pathway:¹

- Exercise and weight loss
- Isoflavones such as soy and flaxseed
- Omega-3 fatty acids
- Vitamins B6, B12, and folate
- Cruciferous vegetables and broccoli derivatives, including indole-3-carbinol (I3C) and diindolylmethane (DIM, result of I2C after activation by stomach acid)

A healthy lifestyle that allows for a **normal weight** helps to decrease the risk of insulin resistance from metabolic syndrome. Insulin resistance results in increased estrogen levels—both by increasing aromatase activity, resulting in the conversion of testosterone into estrogen, and by decreasing sex hormone-binding globulin, resulting in greater amounts of free circulating estrogen.⁵ Insulin resistance also causes increased production of inflammatory mediators, which likely contributes to estrogen-sensitive conditions including fibroids. For these reasons, regular **exercise and anti-inflammatory supplements** are often used in treatment of estrogen-dominant conditions.

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Lifestyle habits also influence estrogen excretion. Women eating a **vegetarian diet** have a three-fold increase in fecal estrogen excretion and have lower serum estrogen levels by 15%-20%.⁶ Intestinal dysbiosis, or an imbalance of the gut microflora, may also contribute to estrogen dominance. Overgrowth of certain gut bacteria increases levels of the enzyme beta-glucuronidase, which cleaves estrogen from glucuronic acid, preventing its excretion and allowing for reabsorption.⁵ Diet and gut microflora influence estrogen absorption and its enterohepatic recirculation. Therefore, clinicians should address intestinal health when considering conditions of estrogen dominance. See the clinical tool on **Promoting a Healthy Microbiome with Food and Probiotics**.

Stress can also influence the balance of hormone levels in the body. Cortisol, the body's stress hormone, is made from precursors that include progesterone. With an increasing need for cortisol production because of high stress, progesterone levels may decrease, disrupting the balance of estrogen and progesterone in the body. For this reason, stress management should be addressed.

In summary, the following healthy lifestyles should be encouraged to support a positive estrogen balance in women at risk or with diagnoses of estrogen-sensitive conditions.

1. Engage in **moderate exercise** daily to maintain a healthy weight.
2. Eat an **anti-inflammatory (or vegetarian) diet**, with only organic meat and dairy, to avoid hormone exposure. Consume foods high in **omega-3 fatty acids** from both fish and flaxseed. Consider **anti-inflammatory botanicals** such as ginger (*zingiber officinale*) and turmeric (*curcuma longa*), in addition to omega-3 supplementation of 1,000 milligrams of EPA (*eicosapentaenoic acid*) and DHA (*docosahexaenoic acid*) daily if inadequate dietary intake.
3. Eat a **high-fiber diet**, as fiber decreases the amount of estrogen absorbed and increases the amount of estrogen excreted.⁷
4. Eat a **diet high in cruciferous vegetables**, including cabbage, broccoli, cauliflower, and Brussels sprouts. Consider supplementing indole-3-carbinol 300 milligrams daily if inadequate dietary intake.
5. Controversy exists regarding whether soy should be consumed in estrogen-dominant conditions because of its phytoestrogenic properties. However, **whole soy foods** help to shift estrogen metabolism toward increased levels of 2-hydroxyestrone and should be recommended. See the **Phytoestrogens** clinical tool, as well as the food and drink section of the **Cancer Care** educational overview.

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6. Consider **supplements** including vitamin B12 100 micrograms daily, vitamin B6 (*pyridoxine*) 50-100 milligrams daily, and folic acid 800 micrograms daily. These vitamins act as cofactors in methylation reactions that are important in the metabolism of 2-hydroxyestrone.

Note: Please see the module on [Dietary Supplements](#) for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

7. **Avoid excessive alcohol** intake, which inhibits estrogen detoxification and increases estradiol levels.
8. **Avoid xenoestrogens**, or environmental compounds that imitate estrogen in the body. Examples include PCBs (polychlorinated biphenyls), BPA (bisphenol A), and phthalates.
9. Promote a **healthy intestinal microbiome**, addressing possible food intolerances and supplementing with probiotics if necessary. See the clinical tool on [Promoting a Healthy Microbiome with Food and Probiotics](#).
10. Engage in a healthy approach to **stress management**. Consider coping techniques, relaxation exercises, and mind-body practices.

Whole Health: Change the Conversation Website

Interested in learning more about Whole Health?
Browse our website for information on personal and professional care.

<http://projects.hsl.wisc.edu/SERVICE/index.php>

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