MERCOLA
Take Control of Your Health

Menopause and the Influence of Estrogen Dominance

Analysis by Dr. Joseph Mercola | November 18, 2026

STORY AT-A-GLANCE

- Contrary to conventional belief, emerging research and expert commentary suggest that many menopausal women may experience estrogen dominance rather than deficiency, with estrogen levels in fat tissue far higher than blood measurements suggest
- A 2024 study found that postmenopausal women using hormone replacement therapy (HRT) had four to seven times more estrogen in their fat tissue than nonusers, pointing to a hormonal environment heavily skewed toward estrogen relative to androgens
- Hormonal health may depend as much on the ratio between progesterone and estrogen as on absolute levels; in one expert's analysis of the study's data, menopausal women not using HRT showed ratios indicative of estrogen dominance
- Estrogen has a dual nature: essential for many bodily functions but problematic when in excess; increased exposure to environmental factors, like linoleic acid in seed oils and endocrine-disrupting chemicals in microplastics, may raise estrogen activity
- Natural strategies for supporting hormone balance during menopause include tracking prolactin levels, eliminating seed oils, avoiding estrogen-mimicking chemicals in everyday products, and discussing natural progesterone with a physician

For countless women, the word "menopause" is associated with the phrase "low estrogen." This is the narrative many have been told, the explanation offered when hot flashes strike, sleep becomes elusive or moods swing unpredictably. Conventional medicine largely operates on this premise, with hormone replacement therapy (HRT) frequently prescribed to replenish what is believed to be lost — estrogen.

But what if this long-accepted understanding of menopause isn't the complete picture? Research is increasingly questioning the singular focus on estrogen deficiency, suggesting instead a more nuanced reality. Studies indicate that estrogen levels in menopausal women aren't plummeting across the board. In fact, levels in certain tissues, such as body fat, can be far higher than circulating blood levels suggest.

This challenges the assumption that simply replacing "lost" estrogen through HRT is an appropriate solution. Indeed, boosting estrogen further, when it's already abundant in tissues, may deepen the imbalance. It's important to understand what's really happening with hormones during menopause, and why a more informed perspective could change how you approach your own health journey.

HRT Use Linked to Much Higher Estrogen Levels in Fat Tissue

A 2024 study published in The Journal of Clinical Endocrinology & Metabolism sought to understand how HRT affects sex hormones in postmenopausal women.[1] Researchers were particularly interested in examining hormone concentrations not just in the bloodstream but also directly within adipose tissue, commonly known as body fat.

- **The study involved postmenopausal women with and without HRT —** This research involved 63 postmenopausal women — 50 using oral HRT and 13 not using it. Fat and blood samples were collected during abdominal surgery for noncancerous gynecologic conditions, and the two groups were compared at a single point in time.

  Scientists measured concentrations of key sex hormones like estrone, estradiol, progesterone and testosterone, in both their subcutaneous fat (fat just under the skin) and visceral fat (deeper abdominal fat), as well as in their blood serum. The findings indicated that HRT users had markedly higher estrogen levels not only in their blood but also within their fat tissue, along with different androgen concentrations.

- **HRT users had much higher estrogen within fat —** Women using HRT had fourfold to sevenfold higher concentrations of two major estrogens, estrone and estradiol, within both subcutaneous and visceral fat, compared to women not on HRT.

  While estrogen was far higher in fat, testosterone, an androgen hormone, was about 30% lower in visceral fat in the HRT group compared to the non-HRT group. Although total testosterone levels in the blood remained similar between both groups, the amount of freely circulating testosterone in the blood was lower in the HRT users.

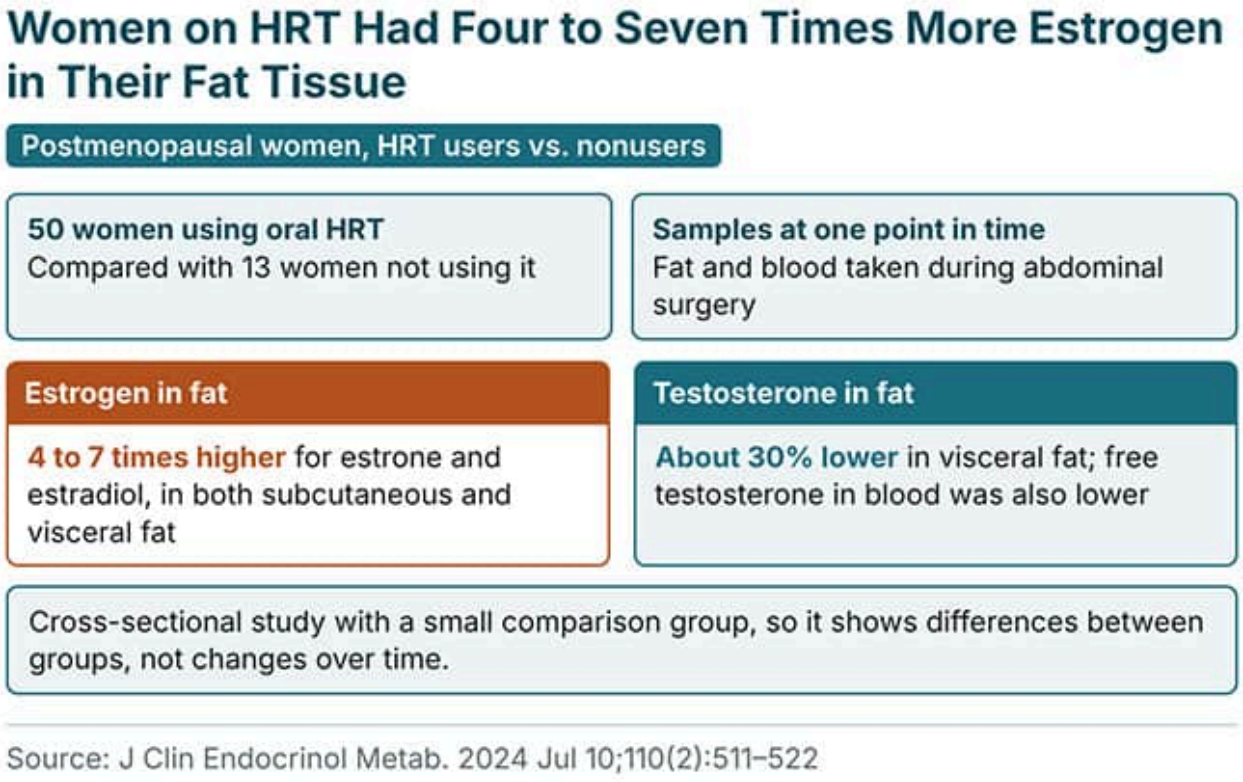


Figure 1. *Postmenopausal women using HRT had four to seven times more estrone and estradiol in their fat tissue than nonusers, and about 30% less testosterone in visceral fat.*

- **Estrogen-to-androgen ratios were far higher in fat tissues with HRT —** Further, the researchers calculated the ratios of estrogens to androgens within fat tissue, and the results were striking. In women using HRT, these estrogen-to-androgen ratios

were between nine and 12 times higher in subcutaneous fat and four to six times higher in visceral fat when compared to women not using HRT.

- **HRT shifted hormone balance to favor estrogen locally in fat —** This shift toward a higher estrogen-to-androgen balance within fat tissue suggests that HRT creates a hormonal environment in fat that's heavily skewed toward estrogen relative to androgens. Even more granularly, the study noted that in visceral fat, estrogen-to-androgen ratios rose as the estradiol dose in the HRT regimen increased.

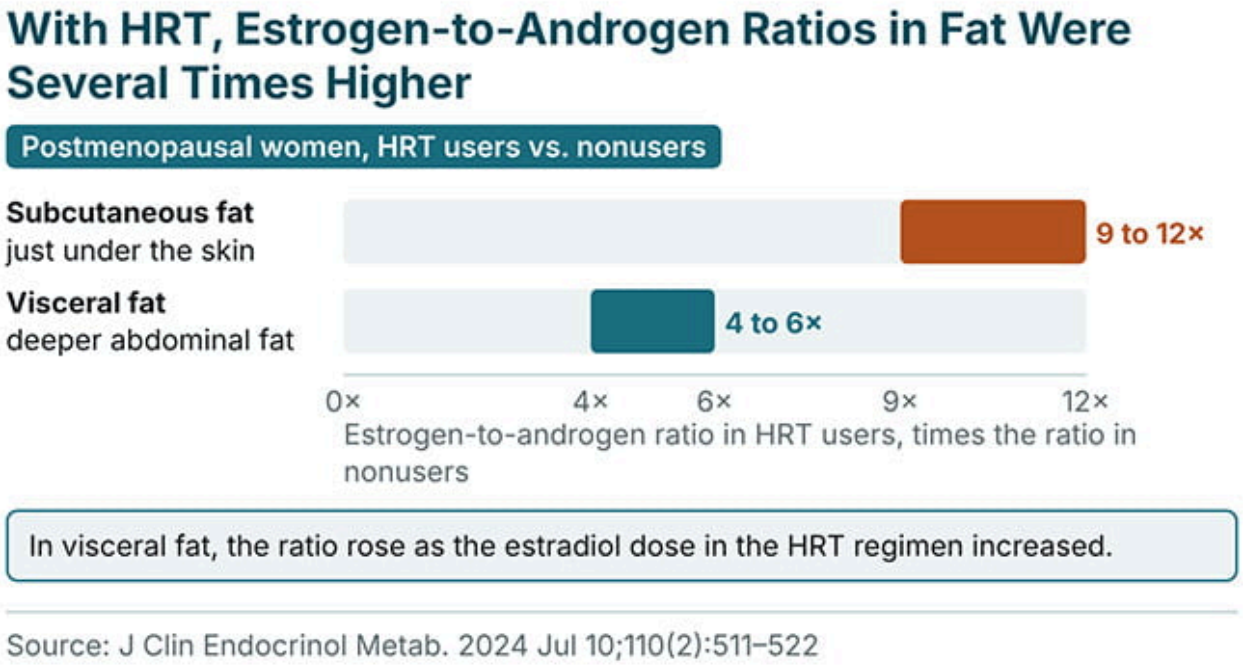


Figure 2. *Compared with nonusers, women on HRT had estrogen-to-androgen ratios 9 to 12 times higher in subcutaneous fat and 4 to 6 times higher in visceral fat.*

These findings point toward a significant influence of HRT on what's called intracrine sex steroid metabolism within adipose tissue. Intracrine metabolism refers to hormone production and action within the cells and tissues themselves, rather than solely relying on hormones circulating in the bloodstream.

The study's results, particularly the consistently high ratio of estrogen in fat tissue compared to serum even in HRT users, suggest that HRT may significantly influence how fat tissue processes and metabolizes sex hormones locally.

It's worth keeping the featured study's design in mind. This was a cross-sectional comparison of 50 HRT users and only 13 nonusers, so it shows differences between groups rather than changes in the same women over time. Moreover, the authors note that some of their analyses relied on small samples.

They also suggested that the local changes they observed could be involved in HRT's known tendency to limit menopause-related belly fat gain — while also noting that the markedly high estrone levels in the fat tissue of HRT users raise questions about overall estrogen exposure, including in relation to estrogen-dependent cancers of the breast and endometrium.

The Case That Menopause Involves Estrogen Dominance, Not Deficiency

Georgi Dinkov, a respected expert in metabolic health, provided commentary on The Journal of Clinical Endocrinology & Metabolism study in a February 2025 post on his blog, shifting the focus from estrogen deficiency to estrogen dominance in menopause.[2] Dinkov's analysis emphasizes that looking at hormone ratios, rather than just absolute levels, paints a very different picture of the hormonal landscape **during and after menopause**.

- **Dinkov detailed the hormone levels in women not using HRT (the control group) —** Contrary to the common belief that menopausal women are estrogen-deficient, Dinkov points out that the absolute levels of key estrogens — estrone, estradiol and estrone sulfate — measured in these women were not actually low. In fact, their estrogen levels were within the normal laboratory reference ranges. He also noted that their blood progesterone sat very close to the lower limit of its normal range.

- **He argues menopause should not be seen as an estrogen-deficient state —** This observation challenges the foundational idea that menopause is fundamentally a condition of estrogen scarcity. Further, in his view, hormonal balance isn't just about

the quantity of individual hormones, but about their ratios to one another. In the case of female hormones, the progesterone-to-estrogen ratio is a key indicator of endocrine health.

- **He adds that this ratio should ideally be quite high, in the range of 200 to 500 —** Dinkov considers a ratio below 100 indicative of **estrogen dominance**, and notes that ratios this low have been observed in virtually all cases of estrogen receptor-positive breast cancer.[3]

  Upon calculating the progesterone-to-estrogen ratio from the data of the non-HRT group in the study, he concluded that these "healthy" menopausal women already exhibited significant estrogen dominance. In blood serum, the progesterone-to-estrogen ratio was a mere 16. In subcutaneous fat, it was around 20, and in visceral fat, approximately 38.

- **Such low ratios would be concerning in premenopausal women —** By Dinkov's thresholds, all of these ratios fall well below the optimal range and squarely within the zone of estrogen dominance. Dinkov argues that if these women were premenopausal and presented with such low progesterone-to-estrogen ratios, it would trigger alarm bells, likely leading to a referral to an endocrine specialist and treatment aimed at raising progesterone activity.

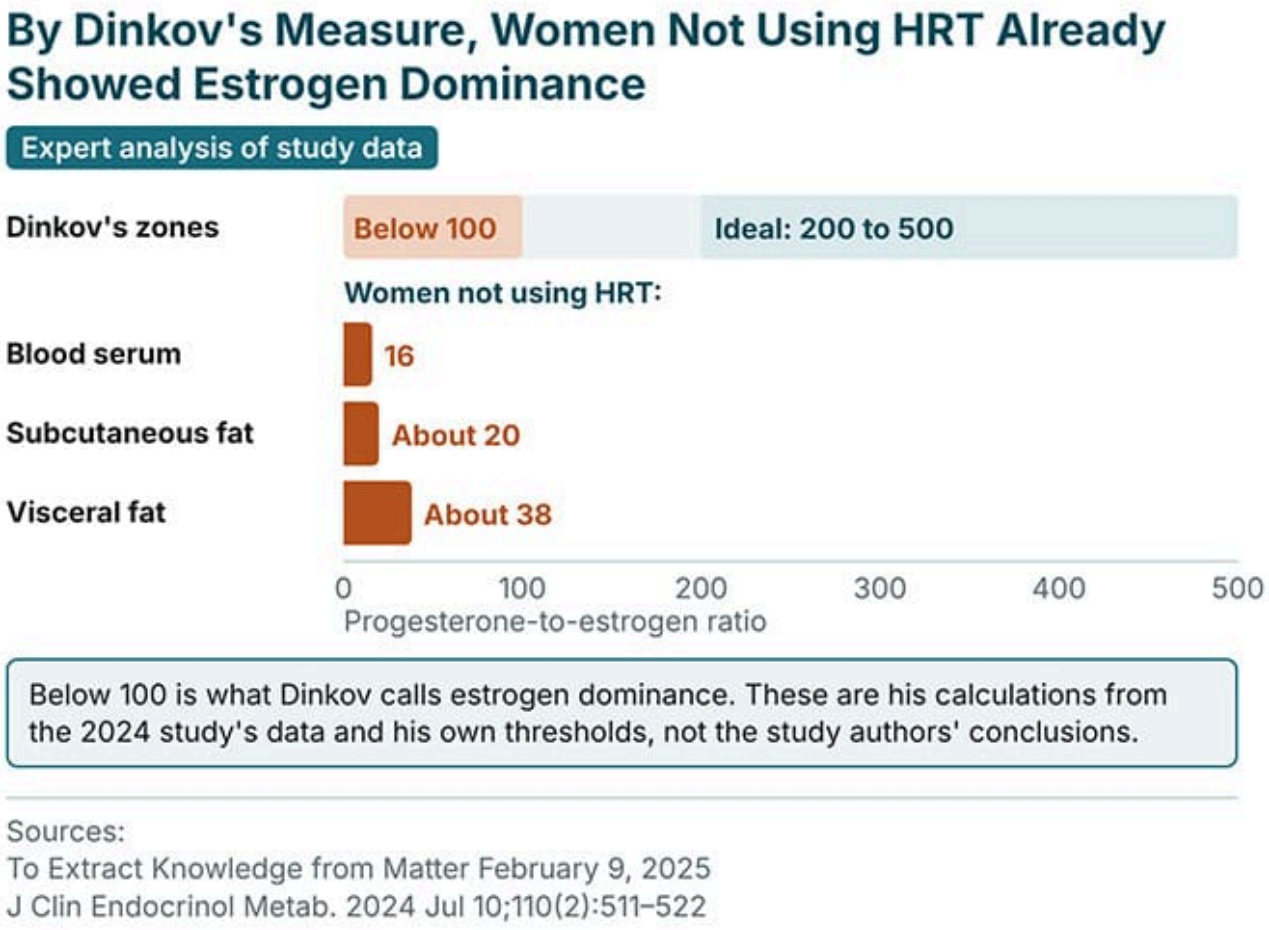


Figure 3. *By Georgi Dinkov's calculations, progesterone-to-estrogen ratios in women not using HRT were 16 in blood, about 20 in subcutaneous fat and about 38 in visceral fat, all below his threshold of 100.*

Dinkov concludes that the widespread use of estrogenic HRT needs serious reconsideration in light of these findings. If menopausal women already tend toward estrogen dominance — even without HRT — then further increasing estrogen levels with HRT could exacerbate this imbalance, worsening health rather than improving it.

Estrogen's Double-Edged Sword — Essential yet Problematic

A 2018 critical review published in Biomedicine & Pharmacotherapy highlights the complex role of estrogen in human health.[4] Estrogen has a dual nature that's both necessary for numerous bodily functions and, paradoxically, linked to disease when its

levels are out of balance. In fact, estrogen is far more than just a sex hormone; it's a key player in overall health and well-being, with effects that span far beyond reproduction.

- **Estrogen supports critical body systems but is also disease-linked —** Estrogen is involved in maintaining glucose and lipid balance, supporting a robust immune system, ensuring bone strength, promoting cardiovascular health and facilitating healthy brain function. However, the very same estrogen is also implicated in numerous diseases, ranging from infections and autoimmune disorders to metabolic disturbances and degenerative conditions.

- **Estrogen is a "necessary evil" —** This contradictory nature of estrogen — both life-supporting and harmful — is what the paper calls its "necessary evil" aspect. The point is that both too little and too much estrogen have been linked to chronic and acute health problems. Separately from this review, the bioenergetic view of health holds that excess estrogen may also raise calcium levels inside cells and impair mitochondrial function.

- **Environmental chemicals may contribute to estrogen dominance —** The paper points out that increased exposure to inflammatory agents and endocrine-disrupting chemicals (EDCs) in your daily environment can increase estrogen levels, or mimic estrogen's effects, fueling estrogen dominance.

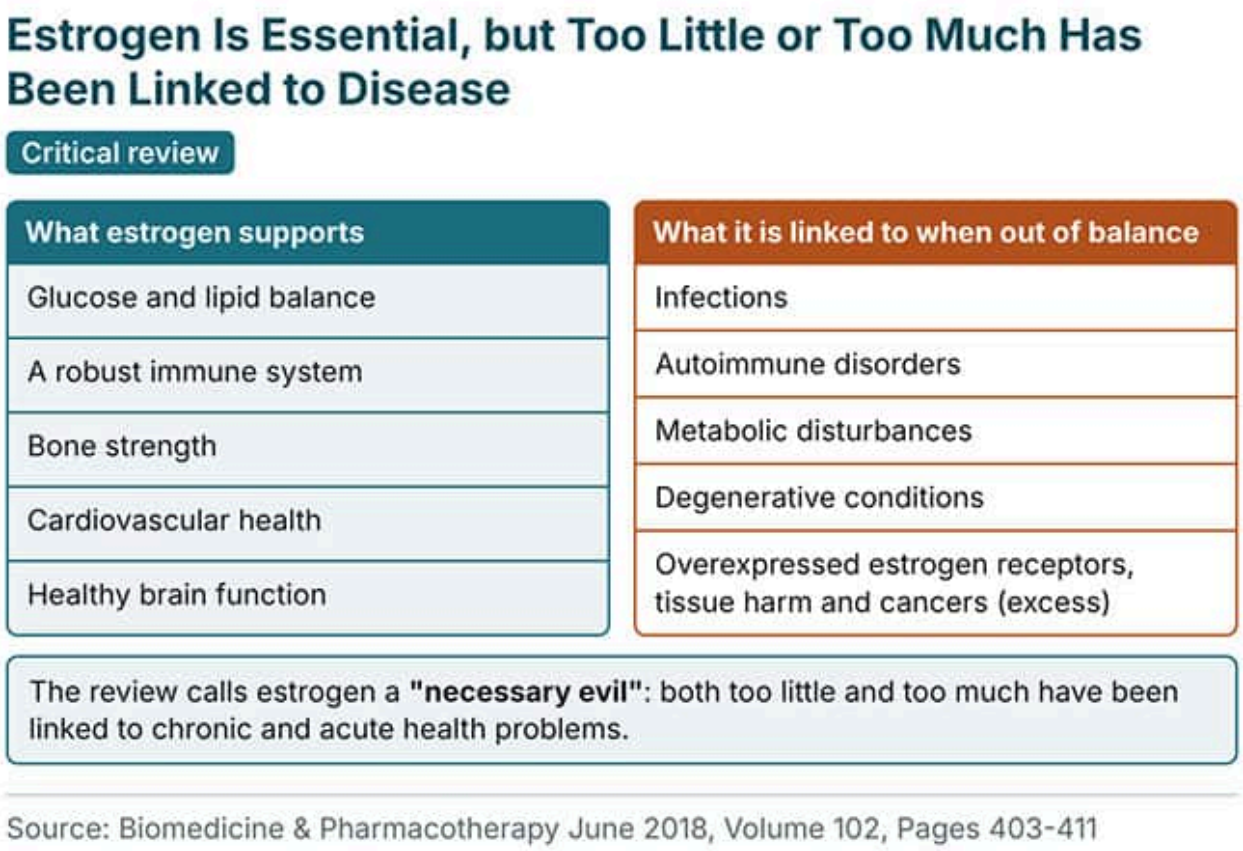


Figure 4. *Estrogen supports glucose and lipid balance, immunity, bone, heart, and brain health, but when out of balance it has been linked to a range of diseases.*

According to the featured review, this excess estrogen, or estrogen-like activity, can drive an overexpression of estrogen receptors, which the authors link to tissue harm, autoimmune diseases, and cancers.

- **Rising rates of hormone-related diseases point to imbalance —** The authors suggest that the rising rates of conditions like polycystic ovarian syndrome (PCOS), infertility, breast cancer, ovarian cancer, and gynecomastia (breast tissue in males) are an indication that estrogen levels are becoming increasingly imbalanced in the population.

Further, because estrogen interacts intricately with many other hormones, enzymes, and metabolic pathways, simply manipulating estrogen levels directly — for example, with drugs that block estrogen production or estrogen receptors — is risky and can have

unintended consequences, and the authors note that HRT is not free of side effects either.

The researchers recommend wise dietary choices and consciously minimizing exposure to harmful chemicals in order to naturally restore and maintain estrogen balance.

Taking Control of Your Estrogen Balance

Managing menopause is less about a simple estrogen "top-up" and more about achieving a balanced hormonal environment in your body. Given the growing view that estrogen dominance, not deficiency, may be a key issue for many, a strategic approach is essential.

You have significant power to influence your hormone balance through everyday choices, which may reduce your reliance on conventional estrogen-based therapies — though any change to a prescribed hormone therapy should be made with your doctor. Here are several concrete steps you can take right now to naturally support healthy estrogen levels and counter estrogen dominance.

1. **Know your prolactin level —** Many people believe they're low in estrogen due to bloodwork, when they may actually have much higher levels in tissues such as body fat. This is because serum estrogen levels may not be representative of estrogen that's stored in tissues.

   Estrogen can be low in plasma but high in tissues. That said, prolactin levels may offer a useful clue about estrogen activity, as estrogen directly stimulates your pituitary gland to produce prolactin. Prolactin is also influenced by other factors, including certain medications, stress, and thyroid function, so it is an indirect marker rather than a direct measure of estrogen.

   When prolactin levels are elevated, it may signal increased estrogen receptor activation, whether from your body's own estrogen production or environmental exposures to EDCs in microplastics and other pollutants. This relationship is

particularly significant when combined with low thyroid function, making prolactin a potentially useful marker for identifying hormonal imbalance. But before deciding on anything, talk to your health care provider about whether this testing is appropriate for you.

2. **Eliminate seed oils in your diet —** Processed foods commonly contain seed oils, rich in polyunsaturated fatty acids (PUFs) like **linoleic acid**, which may have estrogen-like effects, contributing to estrogen dominance. As a result, PUFs may disrupt hormonal balance and mitochondrial function. Keep your LA intake between 2 and 5 grams per day. The Food Buddy, part of upcoming PAX app, can help you track how much LA is in your food.

3. **Become a conscious consumer of everyday products —** Many everyday products contain estrogen-mimicking compounds, including **xenoestrogens**. These sneaky EDCs are common in **microplastics**, personal care products and household cleaners.

   To minimize your exposure, choose natural and organic personal care products, scrutinizing labels for parabens and phthalates. Swap out conventional cleaners for natural, nontoxic options — vinegar and baking soda are safe, simple alternatives.

   Importantly, reduce your plastic use, particularly for food and drinks. Favor glass and stainless steel, and don't heat food in plastic, as heat accelerates the leaching of these estrogenic chemicals into your food. Filter your tap water to remove microplastics and if you buy bottled water, choose glass.

   If you have hard tap water, boiling it may also help. In a 2024 laboratory study, boiling hard tap water for five minutes removed at least 80% of the added nano- and microplastics, which became trapped in the mineral scale that formed — so, pour the water through a fine filter, such as a stainless steel tea strainer, to remove that scale before drinking.[5]

4. **Reconsider estrogen-based therapies and contraceptives —** Carefully evaluate your use of estrogens in HRT and **birth control pills**, as they can contribute to estrogen dominance. Talk with your doctor before changing or stopping any prescribed hormone therapy or contraceptive.

   Explore therapies and contraceptive methods that prioritize your body's natural hormonal equilibrium. Remember, bioidentical estrogen, while often marketed as natural, is still an external estrogen source that contributes to your estrogen load.

5. **Consider natural progesterone to counter estrogen —** For those reaching perimenopause and menopause, natural progesterone is a particularly helpful consideration to discuss with a physician, since it is a prescription hormone. Progesterone acts as a natural antagonist to estrogen, helping to balance its effects. Given the tendency toward estrogen dominance, incorporating natural progesterone may help restore a more balanced hormonal ratio.

How to Use Progesterone

Before the detail that follows: Transmucosal progesterone therapy requires a prescription and a clinician's supervision. What is described below is how it is used under that supervision. It is not a protocol to begin on your own, and progesterone is not a supplement you should self-dose — it is a hormone, and the right dose, the right timing, and whether it is appropriate at all depend on your own circumstances.

If you are pregnant, trying to conceive, on hormonal contraception or being treated for a hormone-sensitive condition, this needs a doctor before anything else.

It’s also important to understand that progesterone is not a magic bullet, and that you get the most benefit by implementing a Bioenergetic diet approach that allows you to effectively burn glucose as your primary fuel without backing up electrons in your mitochondria that reduces your energy production. My book, “Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy,” covers this process in great detail.

Once you have dialed in your diet, an effective strategy that can help counteract estrogen excess is to take transmucosal progesterone (i.e., applied to your gums, not oral or transdermal), which is a natural estrogen antagonist. Progesterone is one of only three hormones I believe many adults can benefit from. (The other two are DHEA and pregnenolone.)

I do not recommend transdermal progesterone, as your skin expresses high levels of 5-alpha reductase enzyme, which causes a significant portion of the progesterone you're taking to be irreversibly converted primarily into allopregnanolone and cannot be converted back into progesterone.

Ideal Way to Administer Progesterone

Please note that when progesterone is used transmucosally on your gums as I advise, the FDA believes that somehow converts it into a drug and prohibits any company from advising that on its label. This is why companies promote their progesterone products as “topical.”

However, please understand that it is perfectly legal for any physician to recommend an off-label indication for a drug to their patient. In this case, progesterone is a bioidentical hormone rather than a synthetic progestin, and the two have different safety profiles — the risks associated with progestins in the hormone therapy literature do not transfer straightforwardly to bioidentical progesterone.

That is not the same as being risk-free at any dose, however. Progesterone is sedating, can affect mood, and interacts with other medications, so the dose must be established in collaboration with the prescribing clinician.

Dr. Ray Peat has done the seminal work in progesterone and probably was the world's greatest expert on progesterone. He wrote his Ph.D. on estrogen in 1982 and spent most of his professional career documenting the need to counteract the dangers of excess estrogen with low-LA diets and transmucosal progesterone supplementation.

He determined that most solvents do not dissolve progesterone well and discovered that vitamin E is the best solvent to optimally provide progesterone in your tissue. You just need to be very careful about which vitamin E you use, as many supplemental vitamin E products are synthetic and do not provide the form your body uses.

It is imperative to avoid using any synthetic vitamin E (alpha tocopherol acetate — the acetate indicates that it's synthetic). Natural vitamin E will be labeled “d alpha tocopherol.” This is the pure D isomer, which is what your body can use.

There are also other vitamin E isomers, and you want the complete spectrum of tocopherols and tocotrienols, specifically the beta, gamma, and delta types, in the effective D isomer. Look for a label showing the full spectrum of tocopherols and tocotrienols in the D isomer form.

When it comes to application, my preferred approach is to dissolve either powdered or liquid progesterone in natural vitamin E — having established the dosing with your prescriber — and apply it directly to the gums. This transmucosal application allows for optimal absorption and use by the body.

There are also premade vitamin E-based progesterone products on the market. Just make sure they’re using natural vitamin E. The recommended time for application is 30 minutes before bed, as progesterone has an anti-cortisol effect and can increase GABA levels, promoting better sleep.

If you are a menstruating woman, you should take the progesterone during the luteal phase or the last half of your cycle, which can be determined by starting 10 days after the first day of your period and stopping the progesterone when your period starts. If you are a male or non-menstruating woman, you can take the progesterone every day for four to six months and then cycle off for one week.

This is what I have been personally doing for over a year with very good results. I am a physician so do not have any problems doing this. If you aren't a physician, you should consult one before using this therapy, as transmucosal progesterone therapy requires a doctor's prescription.

Frequently Asked Questions About Estrogen Balance in Menopause

Q: Is menopause really just about low estrogen?

A: While conventional wisdom says menopause is due to estrogen deficiency, research and expert commentary suggest that estrogen levels aren't always low and that many menopausal women may actually experience estrogen dominance, meaning they have too much estrogen relative to progesterone.

A 2018 review also describes how everyday exposure to inflammatory agents and estrogen-mimicking chemicals can push estrogen activity higher, fueling estrogen dominance.[6] This shifts the focus from simply replacing estrogen to achieving overall hormonal balance.

Q: If estrogen isn't always low, why is HRT so often prescribed?

A: Many people believe they're low in estrogen due to bloodwork, when they may actually have much higher levels in tissues such as body fat. This is because estrogen can be low in plasma but high in tissues. Critics such as Dinkov argue that conventional HRT is often prescribed based on an incomplete picture of estrogen deficiency.

However, a 2024 study found that women using HRT had much higher estrogen levels in both their blood and their fat tissue than nonusers,[7] which Dinkov argues may worsen estrogen dominance in women who already have it.

Q: What does "estrogen dominance" mean for menopausal women?

A: Estrogen dominance refers to an excess of estrogen, particularly relative to progesterone. A 2018 review published in Biomedicine & Pharmacotherapy links excess estrogen, or estrogen-like activity, to overexpression of estrogen receptors, tissue harm, autoimmune diseases and cancers.[8] Excess estrogen is also thought to raise intracellular calcium levels and impair mitochondrial function.

Q: What can I do to avoid estrogen dominance?

A: Lifestyle and dietary changes are powerful tools. Avoid processed foods, as they commonly contain seed oils rich in polyunsaturated fatty acids (PUFs) like linoleic acid, which may have estrogen-like effects. Also reduce your exposure to synthetic estrogens like oral contraceptives and estrogen-mimicking chemicals in everyday products, including plastics. If you use a prescribed contraceptive or hormone therapy, talk with your doctor before making changes.

Q: Are there any natural options to help balance my hormones during menopause?

A: Yes, there are. Beyond lifestyle and diet, consider discussing natural progesterone with a health care provider knowledgeable in hormone balance. Natural progesterone acts as an estrogen antagonist, which may help to restore a healthier progesterone-to-estrogen ratio during perimenopause and menopause.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified health care provider before making changes to your health regimen.

Sources and References

- [1, 7] J Clin Endocrinol Metab. 2024 Jul 10;110(2):511–522
- [2, 3] To Extract Knowledge from Matter February 9, 2025
- [4, 6] Biomedicine & Pharmacotherapy June 2018, Volume 102, Pages 403-411
- [5, 8] Environmental Science & Technology Letters February 28, 2024