

How Microplastics Affect Your Reproductive Health

Analysis by [Dr. Joseph Mercola](#)

October 03, 2024

STORY AT-A-GLANCE

- › Microplastics are accumulating in human reproductive organs, contributing to declining fertility rates worldwide. Studies show microplastics have been found in male testes and female ovaries, affecting sperm and follicle health
- › Plastics contain xenoestrogens like phthalates and bisphenol A, which can disrupt the endocrine system. These compounds mimic estrogen, leading to estrogen dominance and reproductive issues in both men and women
- › Microplastics have been found in human placentas, raising concerns about potential impacts on fetal development and pregnancy outcomes
- › To reduce microplastic exposure, I recommend filtering tap water, choosing alternative packaging materials, using natural fiber clothing, and avoiding plastic food containers, especially when microwaving
- › Progesterone supplementation helps counteract estrogen excess from plastic exposure. An in-depth explanation for proper administration is provided below

The challenge of disposing plastics is a growing concern today. Our overreliance on this manmade material is causing major environmental problems. When disposed improperly, plastic breaks down and makes its way into our own bodies in the form of microplastics.

A 2022 report published in Environment International¹ noted that microplastics had been detected in human blood for the first time. By April 2022, it was discovered "lodged deep

in the lungs of living people."²

Now, research highlights more places where microplastics accumulate within our bodies – the reproductive organs, and this may be contributing to the decline of fertility rates. According to the Institute for Health Metrics and Evaluation (IHME), 76% of countries and territories around the world will have unsustainable fertility rates by 2050. This means that populations will shrink.³

Microplastics Can Affect Male Fertility

In Dr. Kevin Pho's podcast,⁴ Dr. Oluyemisi Famuyiwa, founder of the Montgomery Fertility Center in Rockville, Maryland, discusses how microplastics contribute to the declining fertility rates observed all over the world.⁵ From Famuyiwa's research and medical practice, she noticed a steady decline in semen quality, and that men nowadays are less fertile than their grandfathers. Again, she suggests that microplastics may be the culprit.⁶

Famuyiwa's viewpoint is supported by other research, too. In a study published in *Frontiers in Endocrinology*, the researchers hypothesized:⁷

"It is noteworthy that an exponential rise in global plastic production coincides with a well-documented, population-wide decline in human sperm production which appears to be accelerating since 2000."

Going deeper into their research, the authors noted that microplastic exposure contributes to lower sperm quantity and quality. They cited animal test models, which discovered that microplastics accumulated within the testes. From there, they noted that microplastics caused "localized stress and mitochondrial dysfunction, and over-expression of proinflammatory cytokines in the testis." Other reproductive issues were also observed, such as reduced testosterone.⁸

It seems that these findings are also present in human males (and dogs as well). Famuyiwa cited a 2024 study⁹ published in *Toxicological Sciences*,¹⁰ which investigated the prevalence of microplastics in male reproductive organs.

From a total of 47 canine and 23 human male participants, they discovered 12 types of microplastics in all testes. The mean total amount of microplastics was 122.63 micrograms per gram in dogs, and 328.44 micrograms per gram in humans. Polyethylene was the most prevalent microplastic type. They went on to conclude:

"These findings highlight the pervasive presence of microplastics in the male reproductive system in both canine and human testes, with potential consequences on male fertility."¹¹

Female Fertility Isn't Spared by Microplastics

Unsurprisingly, microplastics can affect adult female fertility as well. According to collated research from animal test models in the *Frontiers in Endocrinology* study,¹² microplastics that accumulate in the ovaries can lead to pregnancy-related issues:

"Ovaries of these exposed rodents have reduced weight, decreased expression of cytoskeletal proteins, and demonstrate altered follicle dynamics, with a reduction in the number of growing and mature follicles and increased atretic and cystic follicles."¹³

For context, follicles play a crucial role in influencing fertility. According to the London Women's Clinic, follicles are small, fluid-filled sacs inside the ovaries that secrete hormones that control the menstrual cycle. Hundreds of thousands of follicles are found in the ovaries, and this number starts to decline by the age of 35. Each follicle typically releases an egg.¹⁴

The *Frontiers in Endocrinology* study¹⁵ noted that accumulated microplastics in ovaries resulted in oxidative stress as well as disturbed antioxidant capacity. Proinflammatory signaling was also observed.

Another research group found microplastics in the placenta.¹⁶ Considered a landmark study by Famuyiwa,¹⁷ research published in *Environment International*¹⁸ noted that it's possible for microplastics to end up in the placenta, potentially affecting the future health of the fetus.

The researchers collected six human placentas from consenting mothers and used Raman Microspectroscopy (a special method to assess chemical compositions of live organisms¹⁹) to evaluate the prevalence of microplastics.

Microplastics were found in all parts of the placenta, including the fetal, maternal, and chorioamniotic membrane sections. While the effects haven't been fully explored yet, the researchers concluded that the presence of microplastics can negatively affect pregnancy and the outcome of childbirth:²⁰

"Potentially, MPs (microplastics), and in general microparticles, may alter several cellular regulating pathways in placenta, such as immunity mechanisms during pregnancy, growth-factor signaling during and after implantation, functions of atypical chemokine receptors governing maternal-fetal communication, signaling between the embryo and the uterus, and trafficking of uterine dendritic cells, natural killer cells, T cells and macrophages during normal pregnancy.

All these effects may lead to adverse pregnancy outcomes including preeclampsia and fetal growth restriction."

Xenoestrogens in Plastics – The Source of Infertility?

There's also another important point brought up in the Environment International study I would like to emphasize – the presence of endocrine-disrupting compounds in microplastics. The researchers noted that these endocrine disruptors "could cause long-term effects on human health."²¹ And as you can imagine, one affected area is fertility.

Microplastics often contain phthalates, which can leach out of the material²² causing endocrine-disrupting effects. What's more, phthalates are not the only endocrine-disrupting substance present in microplastics. Others include bisphenol A (BPA), flame retardants, pesticides and per- and polyfluoroalkyl chemicals (PFAS), so-called "forever chemicals."²³

This hypothesis is further supported in an evidence review conducted for California State Legislature in 2023,²⁴ which noted that "exposure to microplastics is suspected to adversely impact sperm quality and testicular health in humans based on ... high quality of the body of evidence."

Another point I would like to emphasize is that plastics are xenoestrogens that can mimic the effects of estrogen in the body. Most of their danger stems from the stimulation of your estrogen receptors. Phthalates, for example, have estrogenic properties, and have been implicated in other diseases as well. As noted in a study²⁵ published in Healthcare:

*"Human epidemiological studies have shown a significant association between phthalates exposures and adverse reproductive outcomes in both women and men, for instance, Type 2 diabetes and insulin resistance, overweight/obesity, allergy and asthma."*²⁶

The reason for this is the abnormal stimulation of estrogen receptors, which promotes cell proliferation and can contribute to the development and progression of estrogen-sensitive cancers, such as breast cancer²⁷ and endometrial cancer.²⁸

How to Reduce Your Exposure to Microplastics

Preventing, or at the very least minimizing, your exposure to microplastics is your first line of defense against estrogen overload. While that's easy to say, it will require effort to implement, considering plastics are all around you – in your food, water, clothing, home, personal care items and even in household dust.

Educating yourself about different plastic sources and being conscious of them can go a long way to protecting you and your family's health. Here are practical strategies to get you started:

Filter your tap water and avoid water bottled in plastic – If you need to buy bottled water, opt for glass bottles. Also make sure the filter you use to purify your tap water

can filter out microplastics.

Boil hard tap water — If you have hard tap water, consider boiling it before using it for cooking or drinking, as hard water traps more microplastics. Recent research shows boiling hard tap water for five minutes removes up to 90% of the microplastics in the water.

Avoid plastic packaging — Opt for products packaged in glass, metal, or paper instead of plastic. This can significantly reduce the amount of plastic waste that potentially breaks down into microplastics. At home, use wax paper, parchment paper or paper bags to store foods rather than plastic wrap.

Use reusable containers — Replace single-use plastic bottles, cups, and containers with reusable alternatives made from safer materials like stainless steel or glass.

Never microwave plastics — Heat can cause plastics to leach chemicals into food. Use glass or ceramic containers for microwaving.

Avoid plastic cutting boards — Use a wooden or glass cutting board instead.

Opt for natural fibers — Whenever possible, choose clothing and other textile products made from natural fibers like cotton, wool and linen, as synthetic fabrics such as polyester shed microfibers and leach xenoestrogens.

Wash synthetic clothes less frequently — When washing synthetic textiles, use a microfiber filter in your washing machine to trap synthetic fibers and prevent them from entering the water system.

Opt for food grade cosmetics and personal care products — Some cosmetics, toothpastes, and personal care products contain microbeads or other plastic particles. Look for products free of these materials. Ideally, opt for all-natural, food grade products.

In addition to these strategies, there are other ways you can reduce your exposure to microplastics. For example, you can bring reusable shopping bags when buying groceries and bring your own glass containers when taking home leftovers. Avoid processed food as well, as they're typically wrapped or sealed in plastic. Choose fresh, whole produce instead.

In cases of estrogen dominance, supplemental progesterone can be helpful. Progesterone is a natural estrogen antagonist and will counteract the adverse effects of excess estrogen. It's one of four hormones I believe many adults can benefit from. The remaining three are thyroid hormone T3, DHEA and pregnenolone. In the next section, I'll go into detail how to administer progesterone properly.

How to Use Progesterone

Before you consider using progesterone, it is important to understand that it 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 new book, "Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy" comes out very soon and 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 four hormones I believe many adults can benefit from. (The other three are thyroid hormone T3, 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 like Health Natura promotes 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 natural hormone and not a drug and is very safe even in high doses. This is unlike synthetic progesterone called progestins that are used by drug companies, but frequently, and incorrectly, referred.

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. Vitamin E also protects you against damage from LA. You just need to be very careful about which vitamin E you use as most supplemental vitamin E on the market is worse than worthless and will cause you harm not benefit.

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. As an example of an ideal vitamin E, you can look at the label on our vitamin E in our store. You can use any brand that has a similar label.

You can purchase pharmaceutical grade bioidentical progesterone as Progesterone Powder, Bioidentical Micronized Powder, 10 grams for about \$40 on many online stores like Amazon. That is nearly a year's supply, depending on the dose you choose.

However, you will need to purchase some small stainless steel measuring spoons as you will need a 1/64 tsp, which is 25 mg and a 1/32 tsp, which is 50 mg. A normal dose is typically 25-50 mg and is taken 30 minutes before bed, as it has an anti-cortisol function and will increase GABA levels for a good night's sleep.

Unfortunately, this vendor frequently runs out of product, and if that's the case, then you can use [Simply Progesterone by Health Natura](#). It's premixed with vitamin E and MCT oil. Again, while Health Natura states that its product is for "topical use only," I recommend applying it transmucosally, by rubbing it on your gums.

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. The best time of day to take progesterone is 30 minutes before bed as it has an anti-cortisol function and will increase GABA levels for a good night's sleep.

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.

Sources and References

- ¹ [Environment International, May 2022, Volume 163, 107199](#)
- ² [The Guardian, April 6, 2022](#)
- ³ [IHME, March 20, 2024](#)
- ^{4, 6} [Kevin Pho, MD, "How Microplastics Affect Our Reproductive Health"](#)
- ^{5, 10, 17} [KevinMD.com, June 25, 2024](#)

- ^{7, 8} Front Endocrinol (Lausanne). 2023; 14: 1330396, Fertility Effects in Adult Males
- ^{9, 11} Toxicol Sci. 2024 Aug 1;200(2):235-240, Abstract
- ^{12, 13, 15} Front Endocrinol (Lausanne). 2023; 14: 1330396, Fertility Effects in Adult Females
- ¹⁴ London Women's Clinic, "What Are Follicles and Why Are They Important for My Fertility?"
- ^{16, 18, 20, 21} Environment International Volume 146, January 2021, 106274, Abstract
- ¹⁹ Nature Reviews Methods Primers volume 1, Article number: 80 (2021), Abstract
- ²² Environ Sci Technol. 2021 Sep 7; 55(17): 11814–11823, Abstract
- ²³ Scientific American March 13, 2024
- ²⁴ California State Policy Evidence Consortium (CalSPEC). Microplastics Occurrence, Health Effects, [...] January 2023. Sacramento CA, Page 33 (Archived)
- ^{25, 26} Healthcare (Basel). 2021 May; 9(5): 603, Phthalates Toxicology and Risk Assessment
- ²⁷ Environ Sci Pollut Res Int. 2018 Aug; 25(24):23624-23630, Abstract
- ²⁸ Environ Health Perspect. 2020 Dec;128(12):127005, Abstract