

Could Hormone-Disrupting Chemicals Be Behind Your Skin Problems?

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STORY AT-A-GLANCE

- › Hidradenitis suppurativa (HS) is a painful chronic skin condition that affects as many as 3% of Americans and nearly 1% of people worldwide. To date, there is no known cure for it
- › A new study published in Nature Communications revealed that exposure to ultraprocessed food and plastics may worsen HS
- › Researchers found that the activity of NCSTN, a gene commonly mutated in HS, decreased when it was exposed to a “cocktail of eight common bisphenols and phthalates”
- › Persistent exposure to endocrine-disrupting chemicals (EDC) has been associated with obesity, reproductive disorders for men and women, multiple forms of cancers, and even lower IQ development
- › Though it is impossible to avoid EDCs in your life, you can limit exposure by making sustainable lifestyle swaps, like using less plastic and choosing clothing made of natural fibers

Hidradenitis suppurativa (HS) is a chronic skin condition that causes painful lumps, abscesses, and scarring in areas where skin rubs together, such as the armpits, groin, and under the breasts.¹ It affects about 2% to 3% of Americans, mostly African-American

women,² and nearly 1% of people worldwide,³ yet its exact cause remains unclear. There's no cure for HS, only treatments to manage symptoms; yet, even those don't always work.⁴

For years, research has concentrated on genetics and unhealthy lifestyle habits as the causes of HS.⁵ But what if some of the overlooked triggers are hiding in plain sight — like ultraprocessed foods and single-use plastic bottles?⁶

That possibility led scientists to ask a new question: Could these factors be quietly fueling HS and causing other systems in the body to go into a tailspin? The study that follows examines this connection in more detail.

A New Study Links Hormone-Disrupting Chemicals to Hidradenitis Suppurativa

A paper published in Nature Communications sought to determine whether exposures to day-to-day elements like plastics and ultraprocessed foods might play a role in HS.

- **What does a protein have to do with it?** HS is often linked to changes in a protein called nicastrin, encoded by the NCSTN gene. But most people with HS don't have a single genetic mutation.⁷ The researchers wondered whether endocrine-disrupting chemicals (EDCs) found in plastics and packaged foods could interfere with this protein, making the skin more prone to inflammation.⁸
- **Skin samples offer clues** — To uncover disease pathways linking inherited and sporadic HS, researchers analyzed skin samples from 12 adults with HS, ages 22 to 67 from African American, Asian American, Hispanic American, and Caucasian backgrounds, and compared them to samples from eight people without HS.⁹

They found that levels of nicastrin were reduced in all participants with HS, especially in their fibroblasts. These cells maintain connective tissue and regulate immune responses.¹⁰

- **NCSTN mutations linked to hyper-inflammation in connective tissue** – Based on the known link between NCSTN mutations and inflammatory skin diseases, the team hypothesized that losing nicastrin primes fibroblasts to overreact to pro-inflammatory signals like TNF-alpha, a molecule tied to HS, psoriasis, and other skin conditions.¹¹

And indeed, when researchers intentionally inhibited NCSTN expression (thereby lowering nicastrin) in healthy fibroblasts, the cells became "hyperactive," pumping out inflammatory molecules.¹²

This suggests fibroblasts may drive HS inflammation just as badly as keratinocytes (skin cells previously thought to be the primary trigger of this condition). Katlin Williams, the study's lead author and an M.D./Ph.D. candidate in the Garza Laboratory, Johns Hopkins University School of Medicine, said:¹³

"Until recently, keratinocytes were the main focus of HS research ... But we were able to show that intentionally stopping NCSTN expression in non-HS fibroblasts is enough to create a reactive, pro-inflammation environment."

- **Plastics leave a chemical fingerprint** – Skin from HS patients contained higher levels of bisphenols and phthalates, which are chemicals found in plastics and ultraprocessed foods. To see if these chemicals were to blame, researchers applied a cocktail of eight common bisphenols and phthalates to healthy fibroblasts. The result: nicastrin dropped, and inflammation spiked, just like in HS tissue.
- **Why this could change HS care** – The findings suggest that everyday EDC exposures like eating packaged foods or using plastic bottles might make HS worse. According to the researchers:

"These data raise the possibility that environmental exposures contribute to interindividual variability in HS – particularly among patients with recurrent or treatment-resistant disease."

While more research is needed, the researchers advise that cutting back on these exposures could help patients alongside medical treatment:¹⁴

"In summary, this work highlights the importance of immediately counseling HS patients to minimize p-ED [plastic-associated EDCs] exposure as a potential treatment for their disease," they concluded.

"While we show strong evidence of possible causation of p-EDs inducing HS-like phenotypes in our system, the only definitive proof of causation would be the complete removal of p-EDs from HS patients as a cure for the disease, which is not feasible. Further work in the field is required for continued study of p-EDs or other exposures that might promote HS and how we may mitigate it."

What Are EDCs?

Endocrine disruptors are substances that interfere with the functioning of your **endocrine system**, including chemicals that can mimic hormones, trick your body, block real hormones from performing their roles, or alter hormone levels by affecting their production, storage, or breakdown. Some EDCs also change how sensitive your cells are to hormones, altering normal body functions even at very low levels.

- **EDCs have been around for decades** — In the 1920s, pig farmers noticed fertility problems linked to moldy grain containing hormone-like compounds. By 1958, endocrinologist Roy Hertz warned that hormones used in farming could enter the body and mimic natural hormones.

Public concern grew in the 1960s after Rachel Carson's book, "Silent Spring," revealed wildlife harm from pesticides like dichlorodiphenyltrichloroethane (DDT), and how the drug diethylstilbestrol (DES) caused birth defects in children exposed during pregnancy.¹⁵

These discoveries eventually led scientists to coin the term "endocrine disruptor" in 1991, and the World Health Organization (WHO) formally defined EDCs in 2002 as external chemicals that alter endocrine function and cause harmful effects.¹⁶

- **Regulations were passed** – Concerns about endocrine-disrupting chemicals led to major policy changes in the 1990s. In 1996, the U.S. Congress passed the Food Quality Protection Act, requiring the Environmental Protection Agency (EPA) to screen pesticides for hormonal effects. By 1998, the EPA launched the Endocrine Disruptor Screening Program to test chemicals for interference with estrogen, androgen, and thyroid hormones.¹⁷
- **Humans live in a chemically saturated world** – More than 140,000 man-made chemicals are in use today. In 2015, the European Union (EU) produced 323 million metric tons of chemicals, and about 205 million metric tons were considered hazardous.

The Endocrine Disruption Exchange has identified roughly 1,000 agents with endocrine-disrupting activity. While most EDCs are synthetic, some occur naturally, such as phytoestrogens found in plants.¹⁸

- **EDCs show up across many everyday products** – They're found in indoor dust, soil, water, food, cosmetics, soaps, shampoos, toothpastes, plastic containers, toys, nicotine, and fertilizers, just to name a few.¹⁹ Plastic products are one common and ubiquitous source – in 2015, global plastics output reached 380 million metric tons. About 40% of that output became packaging, and 60% of that packaging was for food wrappers and beverage containers.²⁰
- **How they build up in the body** – Most EDCs are lipophilic, meaning they dissolve in fat and can be stored in fat tissue or attach to proteins in the blood. Some stay in the body for months or years, while others clear out more quickly.²¹
- **How they disrupt hormones** – EDCs can mimic hormones and trigger false signals or block receptors so real hormones can't do their job. They can also alter how receptors are made, interfere with intracellular signaling, and affect hormone

production, transport, and breakdown. Some EDCs even cause epigenetic changes, meaning they can switch genes on or off without altering the DNA itself. These changes can reprogram how tissues develop and function over time.²²

Understanding how these chemicals enter our lives and disrupt hormonal balance is only part of the story. The genuine concern lies in what happens next – the cascade of health problems they can trigger when you let yourself be continuously exposed to it.

What Happens to Your Body When It's Overexposed to EDCs?

Everyday exposure to toxic chemicals can hijack your hormone signals and affect your body's system slowly and profoundly. Here are some side effects linked to persistent EDC exposure:

- **Obesity** – Some hormone-disrupting chemicals can mess with how your body handles fat and hunger. These are called obesogens (also known as metabolism-disrupting chemicals). They can slow your metabolism, make you gain weight even if you eat well and exercise, and make weight loss more challenging.²³

A 2025 systematic review in *Ecotoxicology and Environmental Safety* examined 75 human epidemiological studies from 2014 to 2024 to explore how EDCs contribute to obesity. The authors of the study explained their findings:²⁴

"Overall, studies revealed consistent findings across the studies, indicating a significant association between exposure to BPA and related compounds and various obesity-related outcomes.

Specifically, increased levels of BPA and phthalates were associated with higher maternal weight gain during pregnancy, increased oxidant stress, insulin resistance, and disturbances in vascular function in children, as well as higher BMI and risk of obesity and Type 2 diabetes in adults.

Moreover, the analysis identified potential sex-specific effects, with stronger associations observed among females compared to males in some studies."

- **Alzheimer's disease** — EDCs can also trigger obesity-driven leptin resistance, which is associated with a higher risk for Alzheimer's disease (AD). In a 2022 scientific review published in the International Journal of Molecular Sciences, researchers looked at how obesity-related changes in leptin, your main "I'm full" hormone, may help drive dementia and Alzheimer's disease.²⁵

In people with obesity, the brain starts ignoring leptin signals, a problem called leptin resistance. That creates a double hit: Appetite control gets worse (so weight keeps climbing), and the brain loses some of leptin's protective effects (which include supporting memory and learning, shielding neurons from inflammation and injury, and reducing Alzheimer-related changes such as beta-amyloid accumulation).

The authors describe leptin resistance as a process that "perpetuates diseases such as dementia" because the brain no longer receives the full benefits of this hormone.

"Given the relationship between obesity and dementia, some scientists are beginning to investigate a link with leptin. AD has been considered as a brain-type metabolic disorder which requires a readjustment of homeostasis and is influenced by inflammation, adipokines, adipocyte-derived hormones, and the various exposed mechanisms of leptin resistance. Thus, neuronal resistance to leptin is suggested in AD," the researchers said.

"The link between obesity, leptin, and AD is now well established and has been extensively studied. Thus, different epidemiological studies have found an association between AD and changes in body weight. Some

*reports have found that obesity in midlife, as well as weight loss in old age, are related to cognitive decline and increased risk of developing AD."*²⁶

- **Female fertility and uterine health** — In women, these chemicals don't just affect the ovaries; they can also "reprogram" the uterus itself. A 2025 narrative review in *Reproductive Biology and Endocrinology* examined human, animal, and cell studies from 2005 to 2024 on common pollutants like BPA, and phthalates.

The authors found that these chemicals can change epigenetic "marks" on DNA and histones in uterine tissue, altering genes that control menstrual cycles, implantation, and placental development. These shifts were linked with problems such as menstrual irregularities, infertility, fibroids, endometriosis, and pregnancy complications. As the authors summarized:²⁷

"There is much epidemiological, and some animal exposure studies evidence that EDCs are associated with several uterine disorders; however, they receive less attention than ovarian conditions associated with EDC exposure."

- **Male fertility and sperm health** — Some hormone-disrupting chemicals can harm the male reproductive system by lowering sperm count and quality. A 2020 review in *Reproductive Medicine and Biology* examined human and animal studies on bisphenol A (BPA), phthalates, pesticides, and other EDCs regarding male fertility. The authors concluded that:²⁸

"Several studies observe correlations between chemical doses and at least one sperm parameter; however, such correlations are sometimes inconsistent between different studies. Mechanisms through which EDCs exert their pathophysiological effects have not yet been fully elucidated in human studies."

- **Other disorders** — Excessive exposure to EDCs have also been associated with the following health problems:²⁹

- Thyroid, skin, and breast cancer
- Diabetes
- Skin disorders like hyperpigmentation and contact dermatitis
- Autism spectrum disorder
- Reduced IQ
 - Attention deficit disorder (ADD)

To learn more about EDCs, obesity, and Alzheimer's disease, read "[Obesity Drives Alzheimer's Through Fat Vesicles and Leptin.](#)"

Top 10 Ways to Reduce Your Exposure to EDCs

You can't dodge every EDC, but you can lower your load with a few smart, consistent swaps. Focus on food quality, safer packaging, cleaner products, and simple home practices that cut everyday exposures. Start with the steps below and make sustainable changes:

1. **Try a bioenergetic diet** — Center meals on foods that let your body burn glucose cleanly, so electrons don't stall in the mitochondria. That steadier fuel supports adenosine triphosphate (ATP) production, calms stress hormones, and helps you move away from estrogen dominance. I expand on this approach in my book, "[Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy.](#)"
2. **Forget the seed oils** — Many processed foods and restaurant dishes use soybean, canola, corn, sunflower, and safflower oils, which are high in [linoleic acid \(LA\)](#), a polyunsaturated fat (PUF) that can mimic estrogen and impair mitochondrial function. Choose ghee, coconut oil, and beef tallow for heat-stable cooking. Keep LA under 5 grams (g) a day, ideally less than 2 g, and track your intake, ideally with the help of a nutrition app, like my upcoming Mercola Health Coach app.

- 3. Rethink hidden hormone disruptors in daily products** – **Xenoestrogens** or **estrogen-like chemicals** appear in nearly 1,000 everyday items. Check personal care labels for parabens and phthalates, and swap household cleaners for vinegar, baking soda, and essential oils. The fewer synthetic fragrances and solvents you use, the lower your cumulative EDC burden.
- 4. Reduce plastic for food and drinks** – Store and serve hot or acidic foods like tomato sauce in glass or stainless steel. Avoid heating food in plastic or covering hot dishes with plastic wrap – heat increases leaching of additives like bisphenols and phthalates. Choose glass jars and metal water bottles for everyday use. If you want to know why certain plastics can affect your reproductive health, check out "**Environmental Toxins and Poor Health Trends Threaten Fertility Worldwide.**"
- 5. Filter tap water and treat hard water** – Use a quality filter to reduce microplastics and other contaminants in drinking water. For hard water, boil for five minutes to lower microplastic content before cooling and filtering. Replace cartridges on schedule because an exhausted filter can re-release what it captured.
- 6. Shield your cells from electromagnetic field (EMF) exposure** – **EMFs** from cellphones, 5G towers, Wi-Fi routers, and Bluetooth devices can disturb cellular calcium handling and raise oxidative stress. Practical steps include keeping your phone on airplane mode when not in use, turning off Wi-Fi at night, using wired connections, limiting Bluetooth wearables, and keeping electronics out of the bedroom.
- 7. Choose grass-pastured meats and dairy** – Opt for **grass fed and pastured meat products** to cut residues of hormones, pesticides, and fertilizers. Avoid milk from cows treated with recombinant bovine growth hormone/recombinant bovine somatotropin (rBGH/rBST). Better animal diets mean cleaner nutrition and fewer endocrine-active contaminants.

- 8. Pick wild-caught fish (or krill oil) —** Farm-raised fish tend to be higher in polychlorinated biphenyls (PCBs) and mercury. Choose wild-caught species (e.g., Alaskan salmon) that are lab-tested for purity or use a high-quality krill oil for omega-3s with lower contaminant risk.
- 9. Go flame-retardant-free at home —** Sofas, mattresses, and foam pads may contain polybrominated diphenyl ethers (PBDEs) and related flame retardants that migrate into house dust. Select flame retardant-free products and natural fibers like wool, cotton, silk, leather, or Kevlar to reduce endocrine-active compounds indoors.
- 10. Avoid stain- and water-resistant coatings —** Repellent finishes on clothing, carpets, and upholstery often rely on **per- and polyfluoroalkyl substances (PFAS)**. Choose untreated fabrics, spot-clean spills, and use washable covers instead of permanent chemical coatings.

Endocrine disruptors are everywhere, but you can cut your exposure by making incremental changes to your daily habits. Tiny steps count — switch a product here, swap a container there, filter your water when you can. Over time, these choices add up. You don't need to address everything at once. You just need to start, keep it simple, and stay consistent.

Frequently Asked Questions (FAQs) About Endocrine-Disrupting Chemicals (EDCs)

Q: What did the new study find about EDCs?

A: A 2025 Nature Communications study of 12 people with hidradenitis suppurativa (HS) and eight controls found that eight plastic chemicals in packaging and ultraprocessed foods lowered a key skin protein, nicastrin (NCSTN), making skin cells more prone to HS-like inflammation.

Q: What exactly are endocrine-disrupting chemicals?

A: These are chemicals in the environment that interfere with your body's hormone system. They can mimic, block, or scramble natural hormones, affecting metabolism, growth, fertility, and brain development.

Q: Where do these chemicals usually show up or "hide"?

A: They hide in plastic bottles and food packaging, canned linings, pesticides on produce, household dust, receipts, fragrances, shampoos, lotions, and some cleaning products. Because they're used so widely, you can encounter multiple chemicals each day without realizing it.

Q: What health problems are linked to too much exposure?

A: Too much exposure has been linked with obesity, insulin resistance, thyroid imbalance, menstrual and fertility problems, lower sperm quality, some cancers, developmental issues in children, and even changes in brain aging and dementia risk. Effects often build slowly over years of exposure.

Q: If these chemicals are everywhere, how can I start reducing exposure bit by bit?

A: Start with simple swaps: use glass or stainless steel for hot food and drinks, cut ultraprocessed and packaged foods, choose fragrance-free personal care products, ventilate and dust your home regularly, filter drinking water, and replace items gradually as you run out.

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