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French Health Agency Names 21 Endocrine Disruptor Health Effects to Watch

Analysis by Dr. Joseph Mercola | March 25, 2024

STORY AT-A-GLANCE

- France's national public health agency, Santé Publique France (SPF), released 21 health effects linked to endocrine-disrupting chemicals that they consider a priority for surveillance
- A wide range of health effects are potentially linked to endocrine disruptors, such as neurodevelopment disorders, metabolic diseases, immune function disorders and thyroid disorders
- Among the 21 health effects SPF plans to monitor are early puberty, Type 2 diabetes, cardiovascular diseases, behavioral disorders, intellectual deficits and a variety of cancers
- Endocrine disruptors are widespread in household products, including plastics; with a structure similar to natural sex hormones such as estrogen, they interfere with their normal functions — essentially hijacking them
- An additional 16 health effects, ranging from bone disorders to adrenal problems, could not be prioritized because of a lack of scientific experts to achieve a consensus

France's national public health agency, Santé Publique France (SPF), released 21 health effects linked to endocrine-disrupting chemicals that they consider a priority for surveillance.[1] The findings are part of the PEPS'PE study,[2] which was launched in 2021 to prioritize health effects associated with endocrine disruptors.

PEPS'PE acknowledges the increasing body of scientific literature reporting a wide range of health effects potentially linked to endocrine disruptors, such as neurodevelopment disorders, metabolic diseases, immune function disorders and thyroid disorders.

To protect public health, SPF plans to extend its surveillance related to endocrine disruptors' health effects, but since "such monitoring requires resources … choices need to be made concerning what should or can be monitored."[3,4]

Growing Recognition of Endocrine Disruptors' Wide-Reaching Effects

SPF has been surveilling endocrine disruptors' health effects related to reproductive health since 2015. However, the chemicals pose additional health risks as well, necessitating additional surveillance.

Endocrine disruptors are substances that interfere with your hormone system, impacting development in utero and health throughout at all life stages. They work by attaching to hormone receptors, which can change how many receptors are present in cells, as well as affect the creation, movement, levels and breakdown of hormones in your blood.

Hormones are like signals sent through your bloodstream to tell other cells in your body what to do.[5] They're important for regulating certain organs and tissue, and play a role in development and other physiological processes. Since a single endocrine disruptor can interact with more than one type of hormone receptor, it may have a variety of effects on the body. As noted in Frontiers in Public Health:[6]

> *"There are periods of developmental vulnerability during which exposure to endocrine disruptors is critical. These include the in utero period, the post-natal period, and the adolescence period.*
>
> *These periods are highly sensitive to and dependent on the influence of hormones. The action of hormones during development has different effects*

depending on these periods, and these effects can persist throughout life ...

Even in adulthood, and therefore outside these periods of vulnerability, endocrine disruptors exercise effects by interacting with hormone receptors … Some endocrine disruptors can induce epigenetic changes that can have transgenerational effects. Exposure to endocrine disruptors in utero or in the neonatal period can cause disorders that may only appear in adulthood."

Low Doses of Endocrine Disruptors Can Have Greater Health Effects

Adding to the complexity and potential for harm is the non-monotonic dose-response curve of the hormonal system, which means "greater effects can be observed at lower doses of endocrine disruptors than at higher doses."[7]

In traditional toxicology, dose-response curves are often assumed to be monotonic, meaning that as the dose increases, the response either consistently increases (positive correlation) or decreases (negative correlation).

However, with hormonal systems, low doses of a substance can sometimes mimic or block natural hormone signals, leading to effects not seen at higher doses, or vice versa. This can make it challenging to predict the effects of endocrine-disrupting chemicals based on dose alone, as the relationship between dose and effect is not linear.

The recognition of non-monotonic dose-response curves challenges traditional approaches to risk assessment and regulatory toxicology, which often rely on the assumption that "the dose makes the poison," and assumes there is a straightforward, predictable relationship between the amount of exposure to a chemical and its biological effect.

"Thus, exposure to levels below the authorized limit values does not exclude the absence of health consequences," researchers wrote in Frontiers in Public Health.[8]

Further, people aren't exposed to just one endocrine disruptor but rather a cocktail of the chemicals, potentially amplifying the effects:[9]

> *"[T]he cocktail effect is a particular characteristic of endocrine disruptors. This means that endocrine disruptors can have additive, synergistic, or subtractive effects. They sometimes result from the addition of the effects of several compounds present at low doses and acting on the same biological pathways."*

France Plans to Monitor 21 Health Effects Linked to Endocrine Disruptors

While PEPS'PE included 59 health effects that may be caused by exposure to endocrine-disrupting chemicals, it narrowed the list down to 21 that deserve prioritization for surveillance. This includes:[10]

Cryptorchidism (undescended testicles)	Hypospadias, in which the opening of the urethra is on the underside of the penis	Early puberty
Testicular cancer	Alteration of sperm quality	Endometriosis
Infertility	Decreased fertility	Overweight
Obesity	Cardiovascular diseases	Type 2 diabetes
Metabolic syndrome	Behavioral disorders	Intellectual deficits
Attention-deficit disorders	Breast cancer	Prostate cancer
Lymphomas	Leukemias	Asthma

An additional 16 health effects, ranging from bone disorders to adrenal problems, could not be prioritized because of a lack of scientific experts to achieve a consensus.[11]

"These results indicate the need to expand the scope of the Agency's surveillance beyond reproductive health, incorporating new pathologies when surveillance data are available," an SPF press release noted.[12]

Have Your Hormones Been Hijacked?

Endocrine disruptors are widespread in household products, including plastics. With a structure similar to natural sex hormones such as estrogen, they interfere with their normal functions — essentially hijacking them. According to Pete Myers, the chair, founder and chief scientist of Environmental Health Sciences, the future of humankind could ultimately be at risk:[13]

> *"Your hormones have been hijacked. Your body's astonishing, finely calibrated signal system — a system that controls everything from your weight to your fertility to your mood — has been scrambled by loosely regulated chemicals manufacturers use in a myriad of ways including in consumer products.*
>
> *These hijackers — known to scientists as 'endocrine-disrupting chemicals' — are threatening our existence as a species. Driving this problem are chemical companies focused only on cheap plastics and regulators unwilling to do anything about it."*

The book "Count Down," written by Shanna Swan, a reproductive epidemiologist at Mount Sinai's Icahn School of Medicine. It's based on a 2017 study she co-authored, which found sperm counts dropped by 59.3% from 1973 to 2011.[14]

The most significant declines were found in samples from men in North America, Europe, Australia and New Zealand, where many had sperm concentrations below 40 million/ml, which is considered the cutoff point at which a man will have trouble fertilizing an egg.

Overall, men in these countries had a 52.4% decline in sperm concentration and a 59.3% decline in total sperm count (sperm concentration multiplied by the total volume of an ejaculate).

The book expands on what Swan describes as an impending fertility crisis; along with the dropping sperm counts, changes in sexual development pose a threat to human survival and, according to Swan, "The current state of reproductive affairs can't continue much longer without threatening human survival."[15] In fact, she estimates that if current projections continue, sperm counts could reach zero in 2045.

A class of endocrine-disrupting chemicals called phthalates, which are so ubiquitous that the U.S. Centers for Disease Control and Prevention has stated "phthalate exposure is widespread in the U.S. population,"[16] may be particularly to blame.

An estimated 8.4 million metric tons of plasticizers, including phthalates, are used worldwide each year,[17] with phthalate production amounting to about 4.9 million metric tons annually.[18]

Some Endocrine Disruptors Last 'Forever'

Per- and polyfluoroalkyl chemicals (PFAS),[19] also known as "forever chemicals" because they're so persistent in the environment, are another class of endocrine disruptors. More than 12,000 chemicals make up the PFAS class.

Heralded for their grease- and water-resistant properties, the chemicals are commonly found in nonstick cookware, plastics, cosmetics, stain-resistant and waterproof materials, fire-fighting foam and more. Even dental floss and tampons contain them.[20] Exposure is so widespread that PFAS has been found in 97% of Americans.[21] In the human body, PFAS have half-lives of two to five years.[22]

Like other endocrine disruptors, PFAS is linked to a wide range of health effects, from cancer and weakened immune systems to weight gain. Problems with liver, kidney and thyroid function have also been found in relation to PFAS, along with reproductive issues.[23]

PFAS may also trigger declines in fertility and fecundability, the probability of getting pregnant within one menstrual cycle.[24] It's even been linked to cancer by causing

changes in epigenetics, immunosuppression, oxidative stress, inflammation or via hormone and metabolomic pathways.

An accumulation of epigenetic events induced by PFAS exposure can "synergistically amplify tumorigenicity and cancer progression," researchers explained, adding that immune system suppression and chronic inflammation also likely play a role.[25]

Flame retardants — such as decabromodiphenyl ether (BDE-209), belonging to the polybrominated diphenyl ethers (PBDEs) class, and tris(2-chloroethyl) phosphate (TCEP), an organophosphate flame retardant — are also endocrine disruptors that have been linked to papillary thyroid cancer diagnosis and severity.[26] Bisphenol A, organochlorines (DDT), dioxins and organotins are additional endocrine-disrupting chemicals in the environment.[27]

How to Minimize Your Exposure to Endocrine Disruptors

Endocrine-disrupting chemicals are prevalent in our environment, but by making conscious choices you can lessen your exposure. In addition to filtering your water, buy food from a source you know and trust, one using safe, nontoxic organic or biodynamic farming methods. You can also help reduce your exposure by becoming conscious of the plastic you're using daily — and cut back where you can. Also consider opting out of:[28]

Pretreated or stain-repellent treatments — Opt out of these treatments on clothing, furniture and carpeting. Clothing advertised as "breathable" is typically treated with polytetrafluoroethylene, a synthetic fluoropolymer.

Products treated with flame retardant chemicals — This includes furniture, carpet, mattresses and baby items. Instead, opt for naturally less flammable materials such as leather, wool and cotton.

Fast food and carry-out foods — The containers are typically treated.

Microwave popcorn — PFAS may be present in the inner coating of the bag and may migrate to the oil from the packaging during heating. Instead, use "old-fashioned" stovetop non-GMO popcorn.

Nonstick cookware and other treated kitchen utensils — Healthier options include ceramic and enameled cast iron cookware, both of which are durable, easy to clean and completely inert, which means they won't release any harmful chemicals into your home.

Personal care products containing PTFE, "fluoro" or "perfluoro" ingredients such as Oral B Glide floss — The Environmental Working Group's Skin Deep database is an excellent source to search for healthier personal care options.[29]

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