MINIMISING THE IMPACT OF ENDOCRINE DISRUPTING CHEMICALS ON HEALTH AND ENVIRONMENT

A scientific update following the Joint Congress of ESPE and ESE 2025

BACKGROUNDER: EDCs AND CHILDREN

What is the issue?

Exposure of fetuses and children is unavoidable and has severe health consequences

We are all exposed to synthetic endocrine-disrupting chemicals (EDCs) starting from embryonic life. A foetus is exposed to dozens, perhaps hundreds of EDCs in their body before being born. This can significantly affect crucial developmental processes of the fetus and infants as they are extremely sensitive at this early stage of their life to very low doses of hormones and EDCs.

Exposure is unavoidable as EDCs are present everywhere in our daily life. Children are particularly exposed through the placenta, breast milk, toys, plastic bottles and clothes as well as the floors on which babies crawl.

Children are more vulnerable to exposure in comparison to adults. This is because of breathing space closer to the floor, lower body weight, differences in water and food intake, developing organ systems and longer lifespan durations over which cumulative toxic effects might gradually manifest.

Existing peer-reviewed studies provide ample evidence for the association between fetus or childhood exposure to EDCs and the onset of numerous illnesses including endocrine cancer, obesity, disturbed timing of puberty, impaired fertility, neurodevelopmental alterations and many rare diseases in later life (overview of key studies below).

EDCs, for example, alter the normal development of the brain and impair learning and memory in children. This has been shown in animal studies as well as in human population data. Laboratory data also show that very low doses of EDCs disrupt the mechanisms controlling puberty, reproduction and obesity.

Children and Per- and polyfluoroalkyl substances

Per- and polyfluoroalkyl substances (PFAS) are a group of over 10,000 manmade chemicals used as oil and water repellents and coatings for common products including cookware, carpets, and textiles. These EDCs either do not breakdown, or do so very slowly over many years when they are released into the environment and into our bodies, and they continue to accumulate over time.

PFAS are "forever chemicals", chemicals that are very persistent in the environment and in the human body. They are transgenerational and can migrate via the placenta from mother to child during the prenatal period.

In addition to the aforementioned health effects, higher serum PFAS levels in infants have been associated with a lower vaccination response, and prenatal exposure has been associated with aberrant timing of puberty in girls. A recent study showed that nearly 60% of children's textiles labelled "waterproof", "stain-resistant", or "environmentally friendly" contained toxic PFAS substances.

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Endocrine Disruptors and their effects on pubertal development

Endocrine disruptors can affect prenatal growth and cause precocious or delayed puberty and abnormal growth. Precocious puberty can lead to shorter adult height and social and emotional problems, while delayed puberty can cause feelings of anxiety and low self-esteem persisting in adult life.

Studies suggest that EDCs may also contribute to infertility later in life by disrupting the development of germ cells, which are precursors to sperm and egg.

What needs to happen?

While decision makers including at the EU level have become more aware of the risks that EDCs pose for population health, current policies and legislation do not accurately address the specific impact EDCs have on children even before they are born. More can and should be done to avoid early exposure by focusing on the elimination of PFAS, Bisphenols and other EDCs in all food, and other products including cookware, food contact material, cosmetics, clothing, toys, food packaging and floors.

Steps in the right direction, but shortcomings remain

- The ongoing PFAS restriction proposal submitted to the European Chemical Agency by authorities from The Netherlands, Norway, Germany, Sweden and Denmark is an important first step in the right direction. As outlined in the restriction proposal as well as the EU Chemicals Strategy for Sustainability, PFAS should be limited to essential use only.

    - Essential for ESPE means that PFAS should only be employed in those uses that are critical for the functioning of society and where no alternatives are available. Investments are needed to rapidly develop alternative substitutions with less harmful substances.

- In April 2025 the European Parliament and Council achieved a provisional agreement on a Toy Safety Regulation replacing the toy safety directive from 2009. Under the new regulation, specific harmful chemicals will be banned, including known or suspected endocrine disruptors for humans or for the environment. This list includes 10 of the most toxic bisphenols and PFAS (per- and polyfluoroalkyl substances). While ESPE experts explicitly called for group bans for all PFAS as well as bisphenols due to their proven harm to children's health and well-being, ESPE welcomes the current compromise of banning a limited number of chemicals as an important step forward in reducing children's exposure to EDCs.

    - Now that it has a strong legislative basis, the Commission must ensure that the necessary assessments are indeed performed before toy products enter the European market and that large online retailers comply with the regulation and refrain from exploiting potential loopholes.

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- The Commission has in December 2024 adopted **a** ban on the use of Bisphenol A (BPA) **in food contact materials**, due to its potentially harmful health impact. BPA is a chemical substance used in the manufacture of certain plastics and resins.
  - ESPE welcomes this important development which is long overdue taking into account that BPA was already identified as potentially being harmful for our health in the 1930's. Moreover, ESPE favours group bans whereby all types of bisphenols would have been addressed to avoid regrettable substitution.

Outstanding challenges

The upcoming revision of REACH - Registration, Evaluation, Authorization, and Restriction of Chemicals scheduled in Q4 this year and other legislation in the area of EDCs must address a wide range of outstanding issues including the following to accomplish a toxin free environment for children and their families:

1) Ban of EDCs in all consumer products including cosmetics and toys. Under the new Toy Safety Regulation a mechanism is in place to ban additional EDCs at a later stage.
2) Precautionary principle applied for suspected (category 2) EDCs as outlined in the CLP classification of hazard classes, meaning that they would not be allowed on the EU market before more thorough assessment has confirmed them to not cause any form of hazard to human/animal health and/or biodiversity.
3) Group restrictions for Bisphenols, PFAS and other EDC groups of chemicals that have been proven repeatedly to be a hazard. This is to avoid regrettable substitution.
4) Universal PFAS ban with only limited individual exemptions for society critical applications vs current debates around blank exemptions for the pharmaceutical and medical devices industry
5) More extensive information about requirements and independent assessments of current chemicals on the EU market as well as new chemicals that would like to obtain access. These rules should be widely implemented including for companies outside the EU.

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Key studies

Perez F et al. (2013) Accumulation of perfluoroalkyl substances in human tissues

Braun JM. et al (2017) Early-life exposure to EDCs: role in childhood obesity and neurodevelopment

Street. ME. et al (2020) Endocrine-Disrupting Chemicals in Human Fetal Growth

La Merrill MA et al. (2024) Consensus on the key characteristics of metabolism disruptors

Bali D et al. (2023) The impact of the endocrine disruptors on child health

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Useful links

ESPE statement: The detrimental impact of Per- and polyfluoroalkyl substances on children

ESPE statement following the provisional agreement between the Council and European Parliament on the Toy Safety Regulation.

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April 2025, Brussels

About ESPE

The European Society for Paediatric Endocrinology (ESPE) is an international society registered in Europe that promotes the highest levels of clinical care for infants, children and adolescents with endocrine problems throughout the world, including in less advantaged areas. At the EU level, it works with the EU and partner organisations to create a healthier environment for children and adults.

To find out more about ESPE, please visit eurospe.org.