



PFAS have been found in nonstick cookware, stain-resistant carpeting, dental floss, food packaging, drinking water and foods like fish, meat and dairy products.

Report outlines health effects of PFAS chemicals in children, provides recommendations for testing

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New clinical recommendations on per- and polyfluoroalkyl substances (PFAS) from the National Academies of Science, Engineering, and Medicine (NASEM) call for testing children who may have high exposure to the chemicals and providing families with strategies to reduce exposures.

PFAS are a family of chemicals known as persistent organic pollutants since they do not break down easily. They have been in widespread commercial use since the 1950s and have been found in products like nonstick cookware, stain-resistant carpeting, ski wax, dental floss, commercial firefighting foams and food packaging.

PFAS compounds also have been detected in drinking water, house dust and foods like fish, meat and dairy products. Biomonitoring surveys have confirmed that over 98% of Americans have detectable amounts of PFAS in their blood and tissues.

In 2020, NASEM was charged with investigating the health-related issues of exposure to PFAS and providing guidance to health professionals on how to address the medical concerns of individuals who might be exposed to elevated levels of the chemicals. The two-year investigation included a review of the published scientific literature, informed opinions of experts and town hall testimony from affected individuals in contaminated communities.

The report *Guidance on PFAS Exposure, Testing, and Clinical Follow-Up* (<https://bit.ly/3KIPbhQ>) includes infants and children in its findings and recommendations, although the authors acknowledged the uncertainties given there are far fewer scientific studies of PFAS in children.

The report concluded that an association is likely between chronic PFAS exposure in children and medical concerns such as elevated blood cholesterol levels, dyslipidemias, slightly lowered birth weight and reduced antibody response to certain vaccines/infections.

Children are more vulnerable to environmental pollutants like PFAS than adults because of breathing space closer to the floor, lower body weight, differences in water and food intake, developing organ systems and longer lifespans during which toxic effects might manifest.

PFAS in drinking water

The Environmental Protection Agency (EPA) has been working with state and local governments to monitor the level of specific PFAS chemicals in municipal drinking water supplies, and more than 2,800 communities across the country have detected PFAS in their drinking water.

In June, the EPA released updated health advisory levels for PFAS in drinking water that aim to provide a margin of safety from any ill health effects due to exposure. While the health advisories are not enforceable, the EPA will promulgate enforceable standards for two PFAS compounds in late 2023. Several states already have established enforceable limits of PFAS in drinking water.

Key recommendations for pediatric health care providers

- Assess patients for common sources of PFAS in the environment, including drinking water, fish/game caught in contaminated areas and occupations including firefighters and military, and provide families with strategies to reduce exposure such as:
 - Filter contaminated drinking water with an NSF-certified filter.
 - Follow local consumption advisories for fish and game.
 - Use stainless steel or cast-iron cookware instead of Teflon nonstick.
 - Avoid stain-resistant textiles, waterproofing sprays and products with PTFE or “fluoro” ingredients on the label.
- Offer PFAS blood testing to patients with a likely history of elevated exposure (e.g., live in a community with contaminated drinking water). The ideal blood test should assess the concentration of seven common PFAS compounds.
- For those tested, use the sum of seven PFAS compounds to inform clinical care:
 - <2 nanograms per milliliter (ng/mL): PFAS-related adverse effects not expected; provide usual standard of care;
 - 2-20 ng/mL: potential for PFAS-related adverse effects (especially in sensitive groups); encourage exposure reduction strategies, provide usual standard of care with prioritization of dyslipidemia screening per AAP recommendations;
 - ≥20 ng/mL: increased risk of adverse effects; encourage exposure reduction strategies, provide usual standard of care with prioritization of dyslipidemia screening per AAP recommendations, conduct thyroid function testing (with TSH) at well visits for patients over 18 years and assess for signs and symptoms of testicular cancer and ulcerative colitis for those over 15 years.
- While there is evidence that PFAS is present in breastmilk, it is uncertain whether such exposure constitutes a threat to the infant’s overall future health. Breastfeeding is the best option for babies in most cases.

The NASEM report does not consider the costs or availability of testing or insurance coverage.

The report highlights the importance of addressing and avoiding health disparities in responding to PFAS exposure in communities facing structural barriers to health such as tribal nations, rural populations, immigrants and refugees, and communities of color.

While the most important solution to widespread PFAS exposure is policy and regulation to reduce PFAS in the environment and consumer products, pediatricians can provide families with evidence-based guidance and resources.

Drs. Woolf and Zajac are members of the AAP Council on Environmental Health and Climate Change Executive Committee.

Resources

- [Guidance on the management of patients with PFAS exposure, pediatricians can contact their regional Pediatric Environmental Health Specialty Unit](#)
- [Additional information on the NASEM recommendations](#)
- [Information on finding an NSF-certified water filter that removes PFAS](#)
- [Information for parents on PFAS from HealthyChildren.org](#)