



Hot Topics Department

Safety Concerns About Food Additives and Children's Health[☆]Deborah L. McBride, PhD, RN^{*}

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There is growing evidence that some chemicals found in food colorings, preservatives, and packaging materials may harm children's health, according to a new American Academy of Pediatrics (AAP) policy statement which calls for urgent reform of the U.S. food additive regulatory process (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018a). These food additives include food colorings, flavorings and chemicals deliberately added to food during processing, as well as adhesives, dyes, coatings, paper, paperboard, plastic and other polymers which may contaminate food as part of the manufacturing and packaging process. The AAP joins other medical and advocacy groups that have recently expressed increasing concern about the growing body of scientific evidence indicating that certain food additives interfere with the body's natural hormones in ways that may affect long-term growth and development. The new AAP policy statement is based on an accompanying technical report that reviews the scientific evidence outlining the research on the potential adverse effects on children's health from chemicals used as food additives (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018b). The technical report focuses on those food additives with the strongest evidence for concern including bisphenols, which are used in the lining of metal cans to prevent corrosion; phthalates, that are used in adhesives and plasticizers during the manufacturing process; and nitrates/nitrites, which are used as preservatives in cured and processed meats, fish and cheese. Additional compounds of concern discussed in the technical report include artificial food colors, perfluoralkyl and perchlorate. Persistent pesticide residues that inadvertently enter the food and water supply are not addressed in the recent technical report, but have been addressed in a previous AAP policy statement (Forman, Silverstein, & Committee on Nutrition, Council on Environmental Health, American Academy of Pediatrics, 2012). In 2015, the Endocrine Society released a scientific statement about endocrine-disrupting chemicals which reviewed over 1300 studies (Gore et al., 2015). The statement raised concerns that these chemicals disrupt hormones and cause disease. Other medical and scientific communities which have called attention to these issues include a joint report from the World Health Organization and the United Nations Environmental Programme (Bergman, Heindel, Jobling, Kidd, &

Zoeller, 2013) and the International Federation of Gynaecology and Obstetrics (Di Renzo et al., 2015).

The AAP technical report details the research on the specific health effects of these chemicals including insulin resistance, anti-androgenic effects, reduced immune responses to vaccines, thyroid hormone alteration, and the possible exacerbation of attention-deficity/hyperactivity disorder systems (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018b). The AAP technical report notes that data about health effects of food additives on infants and children are limited or missing, in spite of the fact that, in general, infants and children are more vulnerable to chemical exposures. Children are particularly susceptible to the effects of these compounds because of their higher relative exposure compared with adults (because of their higher dietary intake per pound), their metabolic systems, which are still developing, and the fact that their key organs are changing and maturing (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018b). The AAP is particularly concerned about the effects of these chemicals on the endocrine system in early life when organs are particularly susceptible to permanent and lifelong disruption. Minority and low-income populations are disproportionately exposed to these chemicals given that obesity is more prevalent among low-income and minority children in the United States. The disproportionate exposure to these chemicals may partially explain socio-demographic disparities in health according to the policy statement (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018a). The AAP policy statement notes that annual health-care costs tied to endocrine disrupting chemicals are estimated to be roughly \$340 billion.

The AAP recommends that clinicians advise families to take the following steps to reduce chemical exposures to children:

- Eat more fresh or frozen fruits and vegetables (in place of canned foods). Clinicians can support this effort by developing a list of low-cost sources of fresh fruits and vegetables
- Avoid processed meats, especially during pregnancy.
- Avoid microwaving food or beverages in plastic and avoid placing plastics in the dishwasher because heat can cause chemicals to leak into food.
- Use alternatives to plastic, such as glass or stainless steel.
- Look at the recycling code on the bottom of plastic products and avoid plastics with recycling codes 3 (phthalates), 6 (styrene) and 7 (bisphenols), unless the plastics are labeled as biobased or greenware, indicating they are made from corn and do not contain bisphenols.
- Wash hands before handling food and drinks, and washing all fruits and vegetables that aren't peeled.

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These measures would help lower children's exposure to chemicals in food and food packaging that are tied to health problems (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018a). The Healthy Children parenting website site includes these recommendations in both English and Spanish on (<https://www.healthychildren.org/English/healthy-living/nutrition/Pages/Food-Additives.aspx>).

More rigorous testing and regulation of thousands of chemicals including those that are used as food additives, indirectly added to foods when they are used in manufacturing or which leach from packaging and plastics are needed. The AAP statement was particularly critical of the regulatory process and notes that the regulation and oversight of many food additives is inadequate because of several problems in the Federal Food, Drug and Cosmetic Act and the Food Additives Amendment of 1958 (Public Law 85-829, 72 Stat. 1784 (1958)) (Trasande, Shaffer, Sathyanarayana, & Council on Environmental Health, 2018a). The nation's food supply has changed since 1958 when the U.S. Food and Drug Administration (FDA) established its program to regulate chemicals added to food. Since that time Americans have increased their consumption of processed foods, many of which contain large amounts of chemical additives. More than 10,000 chemicals are allowed to be added to food in the U.S., but the FDA is unable to ensure that all those chemicals are safe because many of these chemicals are used under a Generally Recognized as Safe (GRAS) designation without FDA approval or notification (<https://www.fda.gov/food/ingredientspackaginglabeling/gras>). This exception to the Food Additives Amendment of 1958 was intended for common food ingredients, however manufacturers have used this exception to bring to market food additives without FDA review or notification. These additives are designated as safe by company employees or hired consultants with no effort to minimize inherent conflicts of interest. A recent study concluded that current requirements for a GRAS designation do not contain sufficient protections against conflict of interest (Neltner, Alger, O'Reilly, Krinsky, Bero, & Maffini, 2013). Other studies have found that the FDA does not have the authority it needs to identify and obtain information on chemicals of concern that are already on the market. A recent review of the nearly 4000 food additives listed on the FDA's Website (<https://www.fda.gov/Food/IngredientsPackagingLabeling/default.htm>) found that 64% had no research showing they were safe for people to eat or drink, and that data on the effects on reproductive organs were available for less than 300, with only two having information on development (Neltner, Alger, Leonard, & Maffini, 2013). A report by the U.S. Government Accountability Office (GAO) also found that the FDA does not have adequate authority to acquire data on chemicals on the market or to reassess their safety for human health because many chemicals were approved decades ago based on limited and sometimes antiquated testing methods (U.S. Government Accountability Office (GAO), 2010). The same report found that the FDA does not regularly consider cumulative effects of food additives in the context of other chemical exposures that may affect the same biological receptor or mechanism, despite its legal requirement to do so (<https://www.gao.gov/assets/310/300743.pdf>). The National Academies of Sciences, Engineering and Medicine has also issued a report that found that the FDA's toxicological testing recommen-

dations have not been updated based on new scientific and technical advances. It calls for integrating the findings from emerging scientific data, tools and methods to better assess the risk to public health (National Academies of Sciences, Engineering, and Medicine, 2017).

The PEW Charitable Trusts Institute's Food Additives Project has also released a report that states that substantial improvements to the food additives regulatory system are urgently needed. Their recommendations include strengthening or replacing the GRAS determination process, updating the scientific foundation of the FDA's safety assessment program, retesting all previously approved chemicals, and labeling direct additives with limited or no toxicity data (<https://www.pewtrusts.org/en/projects/archived-projects/food-additives-project>).

These critical weaknesses in the current regulatory system for food additives disproportionately affect children. Clinicians need to lobby for a comprehensive assessment of the federal food additives regulatory program. The FDA needs to be given the authority to collect information about the use of food additives on the health of children and to require additional data from industry when gaps on knowledge and potential safety concerns regarding the effects on children are raised.

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