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Statement of Maureen Swanson, Learning Disabilities Association of America
On the Petition Requesting Rulemaking on Products Containing Organohalogen Flame Retardants
Docket No. CPSC-2015-0022
U.S. Consumer Products Safety Commission Public Hearing

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Thank you Chairman Kaye and Commissioners for the opportunity to comment on the Petition requesting rulemaking on products containing organohalogen flame retardants. My name is Maureen Swanson and I direct the "Healthy Children Project" for the Learning Disabilities Association of America (LDA). LDA is the oldest and largest national volunteer organization advocating for children and adults with learning disabilities, with chapters in more than 40 states.

One in six children in the United States has a reported learning or developmental disability including autism, attention deficit hyperactivity disorder, and other learning and developmental delays.[1] Much like halogenated flame retardants, learning and developmental disabilities persist – with lasting impacts on children, families and society. On average, it costs twice as much to educate a child with a learning or developmental disability as to educate a child without a disability.[2]

I am also co-director of Project TENDR (Targeting Environmental Neuro-Developmental Risks). TENDR is an alliance of more than 50 leading scientists, health professionals, and children's health advocates, who in July 2016 published a consensus statement as a national call to reduce widespread exposures to chemicals that interfere with fetal and children's brain development. In the statement, the TENDR experts named PBDEs as a prime example of toxic chemicals that are increasing children's risks for neurodevelopmental disorders, including ADHD, learning disabilities, intellectual impairments and autism.[3] https://ehp.niehs.nih.gov/ehp358/

Based on the extensive toxicological and epidemiological evidence, and in light of widespread exposures, particularly to pregnant women and children, there is now scientific agreement that PBDEs have the capacity to harm brain development, and that even low-level exposures may result in learning, behavioral or intellectual deficits.

The consequences of prenatal exposures to PBDEs appear permanent. Since 2010, three separate studies of hundreds of pregnant women and children – in New York, Ohio and California – have resulted in strikingly similar findings: children more highly exposed to PBDE flame retardants prenatally have lower IQ scores, cognitive delays and attention problems.[4] [5] [6] The decrements in IQ scores persist through the children's school years.

The TENDR statement also outlines the scientists' concerns with halogenated flame retardants that are replacing PBDEs, noting that the replacement flame retardants are similar in structure to PBDEs, and emerging evidence shows they are similarly neurotoxic. [7]

Halogenated flame retardants look like thyroid hormones and can disrupt thyroid function. Thyroid hormone is essential to healthy brain development. In 2015, researchers with the Endocrine Society reviewed evidence on PBDEs and neurodevelopmental outcomes and concluded that PBDE exposure interferes with thyroid hormone and contributes to neurodevelopmental disorders.[8] Recent studies of halogenated flame retardants that have replaced PBDEs show these chemicals also can interfere with thyroid hormone and alter brain development.[9]

Here is what we know: the science is in, and is even clearer now that it was at the first CPSC hearing on this petition. Halogenated flame retardants can change babies' brains and can result in life-long intellectual and developmental impairments.

How are children exposed to halogenated flame retardants?

Halogenated flame retardants cross the placenta to the fetus and are detected in umbilical cord blood and in breast milk.[10] Halogenated flame retardants migrate from furniture, baby and children's products, electronics enclosures and mattresses into household dust. The U.S. EPA estimates that children ages 1–5 ingest on average approximately 100–200 mg dust/day, which is four to five times more than adults ingest.[11]

A 2011 study of baby products found that 80% of the items tested contained halogenated flame retardants.[12] A 2014 study of 40 daycare facilities and preschools in California found halogenated flame retardants, specifically tris phosphate, Firemaster 550 and PBDEs, in 100% of dust samples from the facilities. Levels of these flame retardants in dust were significantly higher in facilities using nap mats made from foam. [13]

A 2012 study found that toddlers were significantly exposed to polybrominated diphenyl ether (PBDE) flame retardants due to transfer of house dust particles from their hands, and objects such as toys, to their mouths. There was a strong correlation between the PBDE levels on the children's hands and the levels measured in their blood.[14] It is likely that other halogenated flame retardants commonly detected in house dust are similarly ingested by babies and young children.

Because of their size and weight, rapid rate of growth and development, metabolism and behaviors, babies and children are likely to experience higher chronic exposures to halogenated flame retardants than adults. In the U.S., 97% of children have PBDEs in their bodies.[15]

Maybe those levels are so low they don't matter much – after all, we're talking about parts per billion. Here's what I would like the Commission to understand: Research in the neurosciences has identified "critical windows of vulnerability" during fetal development and early childhood, when the brain is especially at risk from toxic chemicals, even at extremely low exposure levels.[16] [17] Parts per billion sounds deceptively small. But consider chemicals that are designed to alter behavior, like Ritalin. The prescribed dose of Ritalin for a child with ADHD is active in the child's body at about the same or even lower levels than the level of flame retardants found in children's blood.[18] Both the prescribed behavior-altering chemical, Ritalin, and the behavior-altering toxic flame retardant chemicals are active in the child's body at levels of parts per billion.

Here is what we know: We know that the fetus, infants and children are regularly exposed to halogenated flame retardants, in part because these chemicals migrate from products into house dust and are ingested. We know halogenated flame retardants are active in children's bodies at levels that can disrupt thyroid hormone and

function, which in turn disrupts brain development and function. And we know that the resulting harm to children's minds is permanent.

As an advocate for children and adults with learning disabilities, and as a parent, what I cannot understand is that based on everything we know, why would the Commission allow this class of toxic chemical to continue to be used in products that are in our homes, schools and child care centers?

Restricting a few flame retardant chemicals at a time is a failed approach that results in unreasonable and increased risks to children's health and development. We urge the CPSC to issue the proposed rule and end the cycle whereby chemical makers replace one toxic halogenated flame retardant with another.

Thank you.

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[1] Boyle, CA, Boulet S, Schieve LA, et al. Trends in the prevalence of developmental disabilities in U.S. children, 1997-2008, Pediatrics. Jun 2011;127(6):1034-1042

[2] Chambers JG, Parris TB, Harr JJ. 2004. What Are We Spending on Special Education Services in the United States, 1999-2000? Washington, DC: American Institutes for Research. Available: http://www.csef-air.org/publications/seep/national/AdvRpt1.pdf [accessed 25 May 2016].

[3] Bennett D, Bellinger DC, Birnbaum LS, et al; Project TENDR: Targeting Environmental Neuro-Developmental Risks: the TENDR consensus statement. *Environ Health Perspect*. 2016;124(7):A118-A122.

[4] Julie B. Herbstman, et al. Prenatal Exposure to PBDEs and Neurodevelopment. Environ Health Perspect. 2010 May; 118(5): 712–719.

[5] Eskenazi B. et al. In utero and childhood polybrominated diphyenyl ether (PBDE) exposures and neurodevelopment in the CHAMACOS study. Environ Health Perspect. 2013 Feb;121(2):257-62.

[6] Chen A, Prenatal polybrominated diphenyl ether exposures and neurodevelopment in U.S. children through 5 years of age: the HOME study. Environ Health Perspect. 2014; 122:856–862; **http://dx.doi.org/10.1289/ehp.1307562**

[7] Bennett D, Bellinger DC, Birnbaum LS, et al; Project TENDR: Targeting Environmental Neuro-Developmental Risks: the TENDR consensus statement. *Environ Health Perspect*. 2016;124(7):A118-A122.

[8] Bellanger, M. et al. Neurobehavioral deficits, diseases, and associated costs of exposure to endocrine-disrupting chemicals in the European Union. J Clin Endocrinol Metab. 2015 Apr; 100(4): 1256–1266. Published online 2015 Mar 5.

[9] Patisaul H. et al. Accumulation and endocrine disrupting effects of the flame retardant mixture Firemaster 550 in rats: an exploratory assessment. J Biochem Molecular Toxicology. 2013; 27(2): 124-136.

[10] U.S. Environmental Protection Agency. Flame retardant alternatives for Hexabromocyclododecane. 2014 June; p. 2-12. Available at: http://www.epa.gov/sites/production/files/2014-06/documents/hbcd_report.pdf

[11] U.S.EPA. Child Specific Exposure Factors Handbook. WD, editor. National Center for Environmental Assessment. 2002. EPA-600-P-00-002B.

[12] Stapleton, H. et al. Identification of Flame Retardants in Polyurethane Foam Collected from Baby Products. *Environ. Sci. Technol.*, 2011, *45* (12), pp 5323–5331.

[13] Bradman, A. et al. Flame retardant exposures in California early childhood education environments. *Chemosphere.* 2014 Dec; 116:61-6. doi: 10.1016/j.chemosphere.2014.02.072. Epub 2014 May 15.

[14] Stapleton, H. et al. Serum PBDEs in a North Carolina Toddler Cohort: Associations with Handwipes, House Dust, and Socioeconomic Variables. Environ Health Perspect. 2012 Jul; 120(7): 1049–1054. Published online 2012 May 23. doi: 10.1289/ehp.1104802

[15] Sjödin, A.; Wong, L.; Jones, R.S.; Park, A.; Zhang, Y.; Hodge, C.; Dipietro, E.; McClure, C.; Turner, W.; Needham, L.L.; & Patterson Jr., D.G. (2008). Serum concentrations of polybrominated diphenyl ethers (PBDEs) and polybrominated biphenyl (PBB) in the United States population: 2003-2004. *Environmental Science & Technology*, 42(4), 1377-84. doi: 10.1021/es702451p

[16] Zoeller RT, Brown TR, Doan LL, Gore AC, Skakkebaek NE, Soto AM, Woodruff TJ, Vom Saal FS. Endocrine-disrupting chemicals and public health protection: a statement of principles from The Endocrine Society. Endocrinology. 2012 Sep;153(9):4097-110.

[17] Rice D, Barone S., Jr. Critical periods of vulnerability for the developing nervous system: evidence from humans and animal models. Environ Health Perspect. 2000;108(suppl 3):511–33.

[18] Lanphear BP. The impact of toxins on the developing brain. Annu Rev Public Health. 2015 Mar 18;36:214.