



# Oregon Pediatric Society

A Chapter of the American Academy of Pediatrics. Incorporated in Oregon

May 18, 2021

TO: The Honorable Representative Zach Hudson, Chair  
Members of the Oregon House Committee on Agriculture and Natural Resources

FROM: Shaili Rajput, member and Advocacy Committee Co-Chair of the Oregon Pediatric Society

SUBJECT: An Opportunity to Protect and Prevent: Understanding the Impact of Pesticides on Children's Health

Chair Hudson and Members of the Committee, for the record my name is Dr. Shaili Rajput and I am here on behalf of the Oregon Pediatric Society (OPS), the state chapter of the American Academy of Pediatrics (AAP). I am a member of the AAP Council on Environmental Health and Climate Change, a pediatrician advocate, and a parent. In both my professional and personal life, my priority is to protect children's health and safety and prevent illness and injury.

I would like to address three important facts today about pesticides and children's health. These facts will underscore the necessity of policies such as integrated pest management, particularly in spaces where children are meant to learn and thrive, in an effort to prevent and protect children from serious health consequences associated with pesticides.

**First, children are uniquely susceptible to pesticide toxicities.**

Children are not just small adults. This is a common refrain we use as pediatricians and reminds us that the decisions we make affecting children and their bodies must be skillfully and thoughtfully considered.

Vital organs such as the brain are immature and proceed through crucial stages of development in utero and throughout childhood, rendering them more vulnerable to insult.

Immaturity of organs responsible for toxin removal, including the liver and excretory system, puts children at risk of ineffective removal and subsequent build up of harmful pesticide metabolites. This less effective clearance is why, for example, we dose almost every single medication in children based on weight, unlike adult medications which are typically prescribed in standard universal doses. These differences matter.



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Physically, shorter stature means that children spend their time closer to the ground and when coupled with normal, exploratory behavior - hand-to-mouth or object-to-mouth activity - they are at increased risk of exposure to pesticides used in soils and on surfaces.

Children eat more food, drink more water, and breathe in more air relative to their weight compared to adults. This increases their risk of dietary and inhalant pesticide exposure.<sup>1,2</sup>

**Second, the effects of low-level chronic exposures on child health, in addition to acute exposures, are detrimental.**

Pesticide toxicity is readily acknowledged in the context of acute and accidental events such as unintentional ingestion. These instances of high-dose pesticide exposure may cause irreversible, immediate, and devastating health consequences and can even be lethal. As high-dose pesticide exposure relates to use on school properties, avoiding pesticide application when children and staff are present is critical and an effective target for risk mitigation. But it's not that simple, and it's not the whole story.

Chronic exposure to pesticides in even low doses results in negative health consequences in children. This association may not be as readily apparent as acute toxicity because downstream health ailments are often delayed and/or subtle, and the health outcomes are not always linearly correlated to dose exposure.

Pesticides affect a wide variety of body systems - reproductive, endocrine, respiratory, neurologic, and immune - and the effects start early.<sup>3</sup> A policy statement on pesticide exposure from the AAP Council on Environmental Health and Climate Change cites epidemiologic studies that associate in utero pesticide exposure with adverse birth outcomes including preterm birth, low birth weight, and congenital anomalies.<sup>2</sup> Additional studies suggest an association between chronic, low-level exposures and negative effects on growth and neurobehavioral development. Specifically, research has linked organophosphate exposure with ADHD.<sup>4</sup> A 2015 study in *Pediatrics* linked chronic low-level exposure to insecticides in residential areas to an increased risk of leukemia or lymphoma in young children.<sup>5</sup> Exacerbation of lung disease, such as asthma can occur.

Pesticides, specifically organochlorines and organophosphates, are classified as endocrine disruptors that can affect the endocrine glands and hormones of the body. These chemicals may act as "imposters" of naturally occurring hormones, block the action or alter the chemical message sent by hormones, or disrupt the production of hormones. Studies suggest that exposure to these pesticides may be linked to decreased breast milk production, endocrine



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cancers (breast, testicular), and pubertal/reproductive issues including blockage of male sex hormones, decreased sperm counts, and menstrual abnormalities.<sup>6</sup>

**Lastly, these damages can be mitigated.**

The damages inflicted by acute and chronic pesticide exposure can be mitigated through thoughtful regulatory action. The AAP supports approaches such as integrated pest management (IPM) in minimizing and replacing the use of pesticides while still controlling pest populations.<sup>2</sup> More support for the expansion of existing efforts is needed.

I treat asthma, ADHD, and developmental delays every day in my clinic. I see the ways in which these chronic conditions affect families and their quality of life: Missed days of school and work, hospitalizations, costly medications and therapeutic services, poor self-esteem, depletion of time and energy, literal breathlessness, academic and social frustration, a sense of defeat. Some risk factors, like genetics, are out of our control. But some factors are in our control and pesticide exposure mitigation is one of them. In my world as a pediatrician advocate, where there is knowledge and where there is power, there must be action. We must act to protect innocent children who are powerless in these situations, and to ensure that the spaces where they are meant to grow and learn remain safe.

## References:

1. American Academy of Pediatrics, Letter to the Environmental Protection Agency, June 27, 2017
2. Council on Environmental Health. Policy statement: Pesticide exposure in children. *Pediatrics*. 2012;130(6):e1757–e1763
3. Pascale A, Laborde A. Impact of pesticide exposure in children. *Rev Environ Health*. 2020;35(3):221-227.
4. Liu J, Schelar E. Pesticide exposure and child neurodevelopment. *Workplace Health Saf*. 2012;60(5):235-243.
5. Chen M, Chang C, Tao L, Lu C. Residential exposure to pesticide during childhood and childhood cancers: a meta-analysis. *Pediatrics*. 2015;136(4):719-729.
6. Meeker, JD. Exposure to Environmental Endocrine Disruptors and child development. *Arch Pediatr Adolesc Med*. 2012;166(1):952-958.