

## Polychlorinated Biphenyls (PCBs)

### WHAT ARE POLYCHLORINATED BIPHENYLS (PCBs)?

- PCBs, compounds once used as insulators in the electrical industry, are now banned in the United States, Northern Europe and other countries. These compounds are found throughout the environment and in human bodies worldwide.<sup>1,2</sup>
- PCBs are considered persistent organic pollutants (POPs) because they do not easily break down and they stay in the environment for many years. POPs are toxic at extremely low levels.
- PCBs were left behind as waste by the military at formerly used defense sites (FUDS) throughout Alaska. PCBs produced throughout the world can travel on wind and ocean currents and build up in wildlife and people of the North/Arctic, a process called global transport.<sup>3</sup>

### HOW ARE WE EXPOSED?

PCBs build up in fatty tissue in the body. People are exposed to PCBs through foods such as fish, dairy products, marine mammals, and through breast milk.<sup>1,2,4</sup>

### SYMPTOMS & HEALTH OUTCOMES

- Prenatal exposure to PCBs is linked to lower developmental test scores, short-

term memory defects, and lower IQ levels in children.<sup>1,2,5</sup>

- Health effects that may result from high exposures to PCBs include: chloracne, keratoses and pigmentation of the skin; mixed peripheral neuropathy; and gastritis.<sup>1,6,7</sup>
- Long-term and chronic PCBs exposures are also associated with adverse health effects, including: cancer, immune suppression, neurobehavioral problems, endocrine disruption of sex steroid and thyroid function, cardiovascular disease, and diabetes.<sup>3,8,9</sup>

### FOLLOW UP ACTION

- If you think your patient may have been exposed to PCBs, refer patient to a physician and contact ACAT at (907) 222-7714 or info@akaction.org.
- Recommend breastfeeding to postpartum patients.<sup>1</sup> In communities at risk of chemical exposures, it is even more important that mothers breastfeed their babies because breast milk reduces the effects of the chemicals on infants and makes them healthier.<sup>10,11,12,13</sup>
- Support eating traditional subsistence foods, unless you have information that indicates PCBs or other contamination.

## REDUCING YOUR EXPOSURE

You can prevent or minimize exposure to PCBs in the following ways:

- Consider removing fat that you see on meat and fish whenever possible.
- Consider eating leaner meats whenever possible.
- Consider eating less dairy products; or, if available, choose low fat or nonfat dairy products.<sup>2</sup>
- Although it is uncertain how far contaminants may spread around formerly used defense sites, it is advisable to have water and traditional food sources close to, downstream or downwind of these sites tested for the possibility of harmful exposures. If you have concerns about the safety of your water or traditional foods, contact ACAT or visit our website at [www.akaction.org](http://www.akaction.org).

<sup>1</sup> Etzel RA, ed. 2003. *Pediatric Environmental Health*. 2<sup>nd</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics.

<sup>2</sup> Greater Boston Physicians for Social Responsibility. Provider Reference Card. Available: [http://psr.igc.org/toolkit/ref\\_guide.pdf](http://psr.igc.org/toolkit/ref_guide.pdf) [Accessed 22 June, 2007].

<sup>3</sup> Carpenter DO, DeCaprio AP, O'Hehir D, Akhtar F, Johnson G, Scudato RJ, Apatiki L, Kava J, Gologergen J, Miller PK, Eckstein L. 2005. Polychlorinated biphenyls in serum of the Siberian Yupik People from St. Lawrence Island, Alaska. *International Journal of Circumpolar Health* 64(4): 322-335.

<sup>4</sup> Dewailly E, Nantel A, Weber JP, Meyer F. 1989, Nov. High levels of PCBs in breast milk of Inuit women from arctic Quebec. *Bulletin of Environmental Contamination and Toxicology* 43(5): 641-646.

<sup>5</sup> Jacobson JL. 1996, Sept. Intellectual impairment in children exposed to polychlorinated biphenyls in utero. *New England Journal of Medicine* 335(11): 783-783.

<sup>6</sup> Rogan WJ, Gladen BC, Hung KL, Koong SL, Shih LY, Taylor JS, et al. 1988, July. Congenital poisoning by polychlorinated biphenyls and their contaminants in Taiwan. *Science* 241(4863): 334-336.

<sup>7</sup> Caramaschi F, del Corno G, Favaretti C, Giambelluca SE, Montesarchio E, Fara GM. 1981, June. Chloracne following environmental contamination by TCDD in Seveso, Italy. *International Journal of Epidemiology* 10(2): 135-143.

<sup>8</sup> Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

<sup>9</sup> Carpenter DO. Polychlorinated biphenyls and human health. *International Journal of Occupational Medicine & Environmental Health* 1998; 11:291-303.

<sup>10</sup> Lanting CI, Patandin S, Weisglas-Kuperus N, Touwen BC, Boersma ER. 1998. Breastfeeding and neurological outcome at 42 months. *Acta Paediatrica* 87(12):1224-1229.

<sup>11</sup> Patandan, S, Lanting CI, Mulder PG, Boersma ER, Sauer PJ, Weisglas-Kuperus N. (1999). Effects of environmental exposure to polychlorinated biphenyls dioxins on cognitive abilities in Dutch children at 42 months of age. *Journal of Pediatrics* 134(1):33-41.

<sup>12</sup> Hooper K, She J. 2003, January. Lessons from the polybrominated diphenyl ethers (PBDEs): Precautionary principle, primary prevention, and the value of community-based body burden monitoring using breast milk. *Environmental Health Perspectives*, 111(1):109-114, p. 112.

<sup>13</sup> Greater Boston Physicians for Social Responsibility (GBPSR). 2002, Fall. *Out of Harm's Way: Preventing Toxic Threats to Child Development. Why Breast-Feeding is Still Best for Baby*. Available: <http://www.psr.org/site/DocServer/BFeasyeng2pg.10.18.pdf?docID=5205>.