

OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

THE SCOOP ON BREASTFEEDING AND PCBs

Breastfeeding is the healthiest option for infants and mothers. However, lipophilic environmental contaminants, such as polychlorinated biphenyls (PCBs), can accumulate in breast milk and pose a potential risk to infants. How does a physician balance the health risks due to PCB exposure against the overwhelming evidence that breastfeeding is best? This *CD Summary* reviews the facts, using PCB contamination of fish species in Portland Harbor and their consumption by nursing mothers as a case study.

HEALTH EFFECTS OF PCBs

Data on the adverse health effects of PCBs are available from animal models. Monkeys with long-term exposure to PCBs at 0.005 mg/kg/day included altered finger and toe nails and nail beds, inflammation of tarsal glands, and decreased humoral immunity. Higher doses of PCBs (0.02–0.08 mg/kg/day) cause decreased platelet volume, decreased performance in spatial learning memory and discrimination problem tests, increased eye exudate, and severely altered finger and toenails.¹

Several studies (summarized here¹) have also found subtle health effects of PCBs in children. Various health outcomes were compared in child cohorts based on their mothers' breast milk PCB concentrations. Breast milk PCB concentrations from 0.62–1.8 µg/g-lipid were associated with reduced birth weight, reduced growth (formula-fed, but not breast-fed), and neurobehavioral and immunological alterations in children. In these studies toxicity was usually attributed to prenatal exposure to PCBs, rather than to breast milk exposure. However, one study, known as the "Dutch PCB/Dioxin Study^{2,3}," compared the neurological performance of children exposed to PCBs only prenatally with that of children exposed both

prenatally and postnatally via breast milk. While children consuming milk containing higher PCBs fared worse than children consuming milk with lower levels, all breast-fed children did better than bottle-fed children. The lowest performing children were exposed to high levels of PCBs prenatally but were formula fed after birth. This seems to suggest that breastfeeding, even with PCB-contaminated milk, served to counter the negative effects of prenatal PCB exposure. The majority of studies conclude that, even with moderate contaminant levels, the health benefits of breastfeeding still outweigh the risks associated with contaminant exposure.

PORTLAND HARBOR

If a mother were to consume 142 g/day (about 5 ounces/day) of a resident fish species from Portland Harbor, her breast milk could contain PCB levels as high as 24 µg/g-lipid.^{4,5} Although the population of women consuming such large quantities of local fish is unknown, subsistence fishing is an important component of several tribal and ethnic cultures in Oregon. An infant nursing from a mother with 24 µg-PCB/g-lipid in her milk is estimated to get a PCB dose of 0.063 mg/kg/day. Adverse health effects might be expected at this dose because it is 12 times higher than the lowest dose (0.005 mg/kg/day) shown to cause health effects in monkeys. When compared with the general US/Canada population median breast milk PCB concentration of 0.247 µg/g-lipid¹, 24 µg/g-lipid for Portland Harbor is somewhat unsettling.

HEALTH BENEFITS OF BREASTFEEDING

Breast milk is an inexpensive, ideally balanced source of nutrition.

* These are preliminary calculations based on EPA's guidance. This methodology has not been validated in animal or human studies, and uncertainties exist as to some of the assumptions used.

The infant immune system is matured and bolstered by breast milk components. Breastfeeding is also associated with improved IQ scores and neurological development and reduced risk of SIDS, type I and type II diabetes, leukemia, obesity, asthma, and high cholesterol. In addition, consistent breastfeeding contributes to the psychological benefit of improved mother-infant bonding. Overall, non-breast-fed babies have a 21 percent higher mortality rate than breast-fed babies.⁶

Mothers who breast feed also enjoy health benefits including reduced postpartum bleeding, reduced risk of breast and ovarian cancer, easier loss of excess adipose accumulated during pregnancy, and enhanced psychological well-being with increased bonding between mother and child. Breastfeeding also benefits society by reducing health care costs (healthier babies), increasing worker productivity (children sick less often), and introduces less waste into the environment.⁶

PUBLIC HEALTH MESSAGE

PCB levels in the breast milk of nursing women who eat large quantities of fish caught from Portland Harbor could be substantial. However, because of the numerous benefits associated with breastfeeding, we advise nursing women to avoid consuming PCB-contaminated fish rather than limiting breastfeeding their infants.

The Oregon Public Health Division has issued health advisories regarding consumption of resident fish species from Portland Harbor. The current advisory (www.oregon.gov/DHS/ph/envotox/fishconsumption.shtml#Portland) states that, "Women of childbearing age, especially women who are pregnant, thinking about getting pregnant or nursing, infants and children and people with weak immune systems, thyroid or



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liver problems, should avoid eating resident fish from Portland Harbor. Examples of resident fish include bass, carp and bullhead catfish." It should be noted that other waterways in Oregon, including significant portions of the Columbia River, also contain resident fish tissue PCB levels within range of those found in Portland Harbor.

Physicians play a significant role in identifying women who consume fish caught in areas with high PCB levels. As the PCBs passed on to fetuses and infants represent the total body burden of the mother accumulated over a lifetime, the ideal time to intervene is during early adolescence of young women. An environmental history on young women, especially from Native American Tribal, Eastern European, and Southeast Asian communities, including questions about fish consumption habits, provide a valuable source of information to aid in the prevention of adverse health effects in young children due to PCB exposure.

The focus of intervention should be reduction of PCB exposure to mothers and young women. At the same time it should be emphasized that fish are an excellent source of protein and other nutrients when properly chosen and prepared and that breastfeeding is still best regardless of PCB exposure scenario. Breast milk sample analysis for PCBs for women with histories of local fish consumption guides physicians in their efforts to mitigate adverse health effects due to prenatal PCB exposure.

RECOMMENDATIONS

To promote healthy child development and reduce exposure to harmful environmental contaminants in Oregon, we recommend that:

- All women of childbearing age abide by the current fish advisories by avoiding resident fish species from Portland Harbor.
- Women consult the brochure, "An Expectant Mother's Guide to Eating Fish in Oregon..." (www.oregon.gov/DHS/ph/envtox/docs/mothersguide.pdf) for tips on safer types of fish to eat and for preparation methods that minimize the PCB content of fish.
- All women continue to breastfeed their infants unless directed otherwise by a physician.
- Physicians take environmental histories on women of childbearing age. These environmental histories should take into account propensity to eat resident fish species caught from Portland Harbor or other major Oregon waterways suspected to have high levels of PCBs and other bioaccumulative contaminants.
- Physicians discourage women from eating resident fish species caught from Portland Harbor and other major Oregon waterways and encourage them to eat safer fish species, such as salmon, with lower contaminant levels.
- Physicians have breast milk tested for PCBs in nursing women with a history of potential exposure to high levels of PCBs. Breast milk PCB data should be viewed only as

an indicator of prenatal exposure to PCBs (not as a justification to recommend cessation of breastfeeding) and guide early intervention efforts for individual patients.

FOR MORE INFORMATION

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