

**Children's Environmental Health Center of the Hudson Valley**

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**CHILDREN'S ENVIRONMENTAL HEALTH CENTER OF THE HUDSON  
VALLEY**

**PROTECTING CHILDREN AGAINST ENVIRONMENTAL THREATS**

[www.ChildrensEnvironment.org](http://www.ChildrensEnvironment.org)

**August 2018: Children's Health Advisory  
Health Risks of Seafood Consumption**

**Introduction:** The key health benefits of fish and shellfish, grouped as seafood, are the potential reduction in cardiovascular diseases such as heart attacks and strokes, and also their valuable contribution to the normal develop of the growing fetus and children. In 2010, the US Department of Agriculture recommended Americans should include 8 ounces of seafood in their weekly meals. According to the National Institute of Health, consuming 8 to 12 ounces per week of seafood during pregnancy and breastfeeding may improve an infant's health. Despite these health benefits, there is concern that contaminants in seafood may pose serious health safety issues. Contaminants include methylmercury and other chemicals, as well as bacterial and viral contamination that can make us sick.

**Health Benefits:** Seafood is considered to be an important component of the diet due to its richness in protein, omega-3 polyunsaturated fatty acids (PUFAs), minerals, vitamins, and other nutrients. The benefits of consuming omega-3 fatty acids include prevention of cardiovascular diseases, and decreases in inflammation in the body, which could result in reduced high blood pressure (hypertension), and reduced symptoms from arthritis. The omega-3 fatty acids, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), are important components of cell membranes. DHA is abundant in the brain and retina and is essential for brain development and function. EPA and DHA can be found in oily fish such as salmon, tuna, herring, mackerel and trout. Seafood is high in the mineral zinc, which is essential for growth and normal functioning. Potassium is a key electrolyte that is important for the cells of our body to work properly. Seafood also contains iron, which binds to hemoglobin to carry oxygen in the body, and is really important. Oily fish are also a good source of vitamin D, which helps the body absorb calcium, and we now know is also important in fighting inflammation. Selenium is an essential trace mineral that functions as an antioxidant and promotes a healthy immune system. Selenium also helps fish get rid of stored and dangerous methyl mercury.

**Mercury Toxicity:** One of the greatest health concerns when eating a lot of seafood is the presence of mercury, which can contaminate the marine environment (oceans and lakes). Mercury is transferred to the atmosphere by mining and the use of fossil fuels. It is then deposited into the marine environment directly from the atmosphere, or from run-off from the land; where it is converted into methylmercury by aquatic microorganisms. Fish and shellfish then obtain methylmercury from the organisms that they feed on. The amount of mercury found in seafood increases with age of the fish and the position that kind of fish is in the food chain. Examples of seafood that are high in the food chain and contain high levels of mercury are shark, marlin, swordfish, king mackerel, and tile fish. It is thought that methylmercury can play a role in causing heart diseases, and also may have adverse effects on the Central Nervous System (CNS). For instance, mercury poisoning can lead to memory problems, mood disturbances, ataxia, dysgraphia, dysarthria, difficulty in hearing, and vision loss. Mercury poisoning can also cause numbness, feelings of “pins and needles,” and perhaps reduced muscle strength. Methylmercury has detrimental effects on fetuses and children as their CNS is still developing. So it is especially important for pregnant women and women who are trying to get pregnant to be aware of what types of seafood they eat. Fetal and early childhood mercury toxicity can cause intellectual disability, memory problems, attention deficits, motor deficits, and developmental delay.

**Bacterial And Viral Toxicity:** *Vibrio* species grow in warm waters and can infect people who eat raw shellfish or shellfish that have not been completely cooked, especially oysters. Symptoms of *vibrio* infections include watery diarrhea, abdominal cramping, nausea, vomiting, fever, and chills. Another infection people can get from eating raw or undercooked shellfish is *Norovirus*. *Norovirus* contaminates the marine environment through the leaks in the sewage system and human vomit. The key symptoms of *Norovirus* are stomach pain, projectile vomiting, and severe diarrhea. People can also get Hepatitis A from raw or partially cooked shellfish that come from contaminated water. Symptoms of Hepatitis A include diarrhea, dark urine, jaundice, fever, headache, nausea, abdominal pain, and loss of appetite. Unlike the illnesses mentioned previously, there is a vaccination from Hepatitis A. To avoid getting many of these illnesses, shellfish with already open shells before cooking should not be eaten, and closed shellfish should be boiled or steamed for 5 to 9 minutes after the shell opens. Shellfish whose shells do not open after cooking should not be eaten.

**Other Contaminants:** Seafood can also be contaminated with chemicals. Polychlorinated biphenyls (PCBs) are chemicals used in plastics, paints, and different types of insulators, and were banned in 1979 due to their toxic characteristics. Studies have shown that these chemicals have carcinogenic characteristics and can have adverse effects on our immune system. PCBs can cause neurologic deficits, such as learning problems, and can contribute to high blood pressure. PCBs can still be found in industrial equipment made before 1979 and industrial wastes, since they cannot be easily degraded in nature. Therefore they can get stored in seafood, especially fish that are higher up on the food chain. Another potential chemical contaminant of seafood is chemicals called Dioxins. Dioxins are released into the environment through large scale burning. Like PCBs and mercury, dioxins are found in higher amounts in fish higher up in the food chain. Dioxin is a carcinogen that can also cause insulin resistance, infertility, and cardiovascular problems. It is possible to minimize your exposure to these chemicals by

avoiding eating the skin of seafood, and by avoiding eating the fat of the fish because that is where the PCBs and the dioxins are usually stored.

**Take Home Message:** Seafood (fish and shellfish) have many health benefits, so despite the health hazards associated with seafood, the overall benefits outweigh the risks. It is important to include seafood in the diet without exceeding the recommended nutritional guidelines published in *2015–2020 Dietary Guidelines for Americans*. Furthermore, avoiding seafood with large amounts of contaminants can prevent many illnesses. In order to stay informed about which seafood can cause illnesses, check the United States Environmental Protection Agency (EPA) advisories on seafood. It can be very helpful to try to vary the type of seafood in your diet as much as possible. The FDA and EPA have issued a helpful chart for parents and pregnant women with healthy and safe seafood options:

<https://www.fda.gov/Food/ResourcesForYou/Consumers/ucm393070.htm>

To learn more about including seafood in your diet, check out: <https://www.choosemyplate.gov/ten-tips-eat-seafood>. Also, feel free to contact the Children’s Environmental Health Center of the Hudson Valley if you have any questions or concerns.

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