

**An open letter to federal and state regulators, departments of health,
product manufacturers, businesses, and consumers from over 60
physicians nationwide.**

It is...imperative that we develop specific and timely responses which will substantially reduce and, ultimately, virtually eliminate, mercury emissions to the environment...At stake is the capacity of our children to develop to their full potential—not only their ability to walk and run normally but to learn and remember as they grow.

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As healthcare professionals we are deeply concerned about the responsibility that we all share for human exposure to the toxic metal mercury. In particular, the developing brains of fetuses and infants in many parts of the world are at risk. It is, therefore, imperative that we develop specific and timely responses which will substantially reduce and, ultimately, virtually eliminate, mercury emissions to the environment.

Mercury exists in several forms and may cause a wide range of health effects. However, methylmercury, which results from bacterial transformation of inorganic mercury in sediments of water bodies, is of particular concern. Methylmercury is highly persistent and bioaccumulates in the food chain. It contaminates freshwater and marine fish throughout the world. Fish consumption is the major pathway of human exposure, and the critical toxic effect of methylmercury is its interference with normal brain development.

Methyl mercury easily crosses the placenta and enters the fetal brain where it causes abnormal DNA and RNA synthesis, resulting in aberrant neuronal migration and organization. Although it has been known for some time that unusually high prenatal methylmercury exposure may result in severe psychomotor retardation, the threshold exposure necessary to cause more subtle diverse effects has been the subject of recent epidemiological studies. Detailed longitudinal neurodevelopmental testing of several cohorts of children exposed to mercury prenatally shows that adverse effects occur at exposure levels much lower than previously considered harmful.

Though there is uncertainty about the level of exposure below which no adverse effects are likely to occur, we are concerned that this debate may obscure certain observations which deserve the attention and response of the general public, industry, and government regulators.

Of particular importance are effects of low-level mercury exposure on subtle but important cognitive brain functions. Adverse effects on learning capacity, attention, and memory appear to occur at significantly lower levels of prenatal exposure than more easily measured psychomotor delays. Historical parallels with our understanding of the developmental neurotoxicity of lead should not be ignored. As we learned to examine better for the toxic effects of low-level lead exposure, we progressively lowered our estimate of what we considered to be a safe level. Our understanding of mercury neurotoxicity has

progressed similarly, and we must avoid the temptation to conclude that we can establish a safe level of exposure with certainty.

Human activity has fundamentally altered the global biogeochemical cycling of mercury. According to the EPA, in their 1997 report to Congress, anthropogenic emissions of mercury to the air are 50-75% of the total input from all sources. Consequently, we must assume responsibility for the bulk of current and future human exposures.

At the present time, freshwater fish in nearly 40 states are sufficiently contaminated with mercury to require warnings to pregnant women or women of reproductive age not to consume the fish because of potential threats to the developing brains of their children. Moreover, in some areas of the country, there has been a steady increase in mercury levels over the past decade.

Lost in aggregate analyses are groups of people who eat larger than average amounts of fish because of dietary habits or out of economic necessity. In many instances they are unaware of fish advisories, unable to read them, or unable to heed their warnings. Fish are an important and, for some people, a primary source of protein and other nutrients. Regrettably, human activity has contaminated this food supply with a long-lived toxic compound that interferes with normal brain development.

The science which identifies and explains the developmental neurotoxicity of mercury is compelling. It is imperative that we identify and reduce all sources of anthropogenic mercury emissions into the environment. Fish are a critical source of nutrition for many people throughout the world. It is unacceptable that, in many places, fish are unsafe to eat because of mercury contamination. At stake is the capacity of our children to develop to their full potential—not only their ability to walk and run normally but to learn and remember as they grow.

Toxicologists should and will debate minimal risk levels of exposure. However, this should not divert us from the important public health task at hand.

We urge:

1. Federal and state regulators to identify sources of anthropogenic mercury emissions and take the steps necessary to substantially reduce those emissions with the goal of their virtual elimination.
2. Product manufacturers to clearly and publicly identify products which contain mercury and to work toward elimination of mercury-use wherever possible.
3. Consumers to identify mercury-containing products that they use and to purchase substitutes whenever possible. Physicians and hospital-supply purchasers have a particular obligation in this regard.
4. All users of mercury-containing products and waste disposal companies to insist on comprehensive waste segregation and recycling programs in order to keep mercury out of the waste stream.

A comprehensive approach to managing mercury use and eliminating environmental releases is required in order to protect this and future generations of children from this hazard.

Sincerely,

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