



# Hot Topics: Aluminum

## What Parents Should Know About Aluminum

### Background

- Aluminum is the third most abundant element after oxygen and silicon, and it is the most abundant metal making up almost 9 percent of the earth's crust. Aluminum is found in plants, soil, water and air.
- Aluminum is used extensively in various ways:
  - in food-related products including pots and pans; storage containers, such as beverage cans; and foil.
  - in numerous foods and beverages, including fruits and vegetables, beer and wine, seasonings, flour, cereals, nuts, dairy products, baby formulas, and honey. Typical adults ingest 7 to 9 milligrams of aluminum per day.
  - for manufacturing of airplanes, siding, roofing materials, paints, pigments, fuels and cigarette filters.
  - in health products including antacids, buffered aspirin, antiperspirants, and some vaccines.

### Aluminum in Vaccines

Aluminum is used in vaccines as an adjuvant. An adjuvant is a vaccine component that boosts the immune response to the vaccine. The adjuvant effects of aluminum were discovered in 1926. In spring 2000, the National Vaccine Program Office (NVPO) reviewed aluminum exposure through vaccines and determined that no changes to vaccine recommendations were needed based on aluminum content. The Global Advisory Committee on Vaccine Safety, part of the World Health Organization (WHO), has also reviewed studies and found no evidence of health risks that would require changes to vaccine policy.

- Vaccines containing adjuvants are tested extensively in clinical trials before being licensed. Aluminum salts are the only materials that can be used as adjuvants in the United States. The quantities of aluminum present in vaccines are low and are regulated by the Center for Biologics Evaluation and Research (CBER).
- The aluminum contained in vaccines is similar to that found in a liter (about 1 quart or 32 fluid ounces) of infant formula. While infants receive about 4.4 milligrams of aluminum in the first six months of life from vaccines, they receive more than that in their diet. Breast-fed infants ingest about 7 milligrams, formula-fed infants ingest about 38 milligrams, and infants who are fed soy formula ingest almost 117 milligrams of aluminum during the same period
- Given the quantities of aluminum we are exposed to on a daily basis, the quantity of aluminum in vaccines is miniscule.

Quantities of Aluminum in Vaccines	
Pneumococcal vaccine	0.125 mg/dose
Diphtheria-tetanus-acellular pertussis (DTaP) vaccine	< 0.17 to < 0.625 mg/dose
Haemophilus influenzae type b (Hib) vaccine	0.225 mg/dose
Hib/ Hep B vaccine	0.225 mg/dose
Hepatitis A vaccine (Hep A)	0.225 to 0.25 mg/dose (pediatrics) 0.45 to 0.5 mg/dose (adults)
Hepatitis B vaccine (Hep B)	0.25 to 0.5 mg/dose
Hep A/ Hep B vaccine	0.45 mg/dose
DTaP/inactivated polio/ Hep B vaccine	< 0.85 mg/dose
Quantities of Aluminum in Other Things	
Breast milk	0.04 milligrams per liter (mg/L)
Ponds, lakes, streams	0.1 mg/L
Infant formula	0.225 mg/L
Soy-based formula	0.46 to 0.93 mg/L
Buffered aspirin	10 to 20 mg/tablet
Antacid	104-208 mg/tablet

Adapted from Vaccine Education Center, Childrens Hospital of Philadelphia

For more information: <http://www.chop.edu/consumer/jsp/division/generic.jsp?id=88655>

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