

Aluminium in our environment

Aluminium is the third most abundant element present in the earth's crust and found naturally in soil, plants, some foods we eat and water. Aluminium is added during the processing of some foods such as bread and is also in the air we breathe. Baby formula, commercial cow's milk and human breast milk all contain aluminium. Baby formula has the highest amount, around 226 micrograms/litre, and human milk the lowest, around 14–34 micrograms/litre.

Aluminium and our body

We are born with some aluminium already stored in our body and continue to add to our aluminium stores through eating, drinking, and some medicines. Vaccines contribute very little to this and are given infrequently.

Even though we regularly consume food and drinks containing aluminium throughout our lifetime, only a small amount of aluminium travels into the blood stream from digestion, the rest comes out in faeces. Most of the aluminium that enters our blood stream is quickly processed and removed by the kidneys in urine. The small amount that stays in our body is mainly stored in our bones, with some stored in our lungs and brain.

Individuals with kidney problems who regularly take medications containing a lot of aluminium over a long period of time may store too much aluminium, leading to illnesses involving the lungs, nervous system, blood, or bones. However, it is still recommended that they receive aluminium-containing vaccines to protect them from other diseases.

Aluminium in vaccines

Some vaccines contain a tiny amount of aluminium salts, such as aluminium hydroxide, aluminium phosphate, and potassium aluminium sulphate (alum), to act as an adjuvant. Aluminium adjuvants help retain the active component of the vaccine (antigen) at the injection site and attract inflammatory factors and immune system cells to the injection site to enhance the immune response to the vaccine. Generally, the use of aluminium adjuvants in vaccines means that less antigen is required, or, with some vaccines, fewer doses are needed.

Aluminium in vaccines is safe

Aluminium salts have been used as adjuvants for more than 80 years and millions of aluminium-containing vaccine doses have been given. Use of aluminium salts has a long and impressive safety record. A review of all the available studies of aluminium-containing diphtheria, tetanus and pertussis vaccines (either alone or in combination) did not find any evidence that aluminium salts in vaccines cause serious or long-term health problems. Some studies have found aluminium-containing vaccines to be associated with local reactions and, less often, with the development of a small nodule at the injection site. This is particularly so if the injection is given too superficially. Other studies have reported fewer reactions with aluminium-containing vaccines than those without. This depends on the overall vaccine formulation.

There is no evidence that the aluminium from infrequent vaccine doses cannot be removed by the body. The potential benefits from disease prevention through immunisation with aluminium-containing vaccines are greater than an unproven, theoretical risk from intermittent exposure to aluminium in vaccines.

Summary

Purpose	Safety
Aluminium salts are used in some vaccines to enhance the immune response.	<ul style="list-style-type: none">» There is no evidence that aluminium in vaccines causes long term problems.» Some individuals will experience short term local reactions where an aluminium-containing vaccine has been given.» The potential benefits from disease prevention through immunisation with aluminium-containing vaccines are greater than an unproven, theoretical risk from intermittent exposure to aluminium in vaccines.

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