



Toxic Effects of Aluminium

Aluminium accumulates in the Stomach.

Aluminium may stimulate the production of Free Radicals and may initiate the Cross-Linking process.
references

Aluminium accumulates in the Liver.

Aluminium accumulates in the Thyroid.

Aluminium accumulates in and disrupts the formation of Bones.

Long-term exposure to Aluminium may increase the risk of Fractures (especially Hip Fractures). Aluminium may impair the function of Osteoblasts

Aluminium may cause Osteomalacia.

Exposure to Aluminium may increase the risk of Osteoporosis (as Aluminium impairs the function of Osteoblasts).

Aluminium is strongly implicated in Alzheimer's Disease:

- Whenever the Brains of dead Alzheimer's Disease patients are dissected, researchers find Aluminium accumulated in them.
- When injected into the brains of animals, Aluminium causes tangles of the Dendrites within the Brain.
- Areas which use Aluminium Sulfate to purify drinking water, show increased incidence of Alzheimer's Disease.
- Aluminium facilitates the toxic accumulation (aggregation) of Amyloid-Beta Protein (a known contributory factor to Alzheimer's Disease).

Aluminium has been implicated as a possible cause of Amyotrophic Lateral Sclerosis

Aluminium concentrates in the Brain:

- Aluminium may cause Convulsions in the Brain.

Aluminium may contribute to Down's Syndrome.



Aluminium may be a cause of Multiple Sclerosis (MS).

Aluminium may enhance the deposition of Amyloid-Beta Protein in Neurons: references

- Aluminium may damage Myelin Sheaths.

Aluminium may be a cause of Parkinson's Disease.

Aluminium (when it concentrates in the Brain) may impair Short-Term Memory.

Molecules within the body that become bound to Aluminium are no longer able to absorb Oxygen from the Blood Vessels.

Molecules within the body that become bound to Aluminium are no longer able to absorb Water from the Blood Vessels.

Aluminium may Exacerbate the Effects of these Toxic Substances

Aluminium may facilitate the toxic accumulation (aggregation) of Amyloid-Beta Protein. references

These Substances may Inhibit the Accumulation of Aluminium or Facilitate the Excretion of Aluminium from the Body

Cysteine may minimize the toxic effects of Aluminium]

Cystine may minimize the toxic effects of Aluminium.

The synthetic Amino Acid Ethylene-Diamine-Tetra-Acetate (EDTA) is used in Chelation Therapy to bond to and chelate (remove) Aluminium from the body via the Kidneys

Methionine binds (chelates) with Aluminium and may facilitate its excretion. Taurine may facilitate the excretion of Aluminium from the body.



Melatonin may bind to Aluminium and may facilitate the excretion of Aluminium from the body. Melatonin may also inhibit the generation of Free Radicals by Aluminium.

Clinoptilolite (a type of Zeolite) may facilitate the removal of Aluminium from the body.

Iodine may facilitate the excretion of Aluminium from the body.

Lithium may bind with and remove (chelate) Aluminium from the body.

Selenium may counteract the toxicity of Aluminium.

Silicon may facilitate the excretion of Aluminium from the body:

- Silicon converts Aluminium from both Water and other dietary sources into insoluble Hydroxyaluminosilicates which cannot enter the bloodstream or the Brain.
- In one study, when Silicic Acid (Sodium Silicate) was added to the Water consumed by test subjects, their serum Aluminium content decreased by 85% within one hour and by 92% within six hours.

Citric Acid may facilitate the excretion (chelation) of Aluminium from the body:

- Citric Acid may be especially effective for removing Aluminium from body tissues other than Brain and Nerve Tissues.

Malic Acid may facilitate the excretion (chelation) of Aluminium from the body:

- Malic Acid may be particularly effective for removing Aluminium from the Brain and Neurons.

Succinic Acid may facilitate the excretion (chelation) of Aluminium from the body.

Glutathione (usually after incorporation into the endogenous Glutathione Peroxidase enzyme) may detoxify Aluminium by removing it from the body

Vinpocetine may facilitate the removal of Aluminium from the body

Dimethyl Sulfoxide (DMSO) may facilitate the removal of Aluminium from the body.

Methylsulfonylmethane (MSM) may facilitate the removal of Aluminium from the body.



Folic Acid may inhibit the accumulation of Aluminium in the body's tissues.

Vitamin C may minimize the toxic effects of Aluminium and may facilitate the excretion of Aluminium from the body.

Vitamin E may lower plasma Aluminium levels and may inhibit the accumulation of Aluminium in the Brain.

These Foods/Herbs may Help to Eliminate Aluminium from the Body

Coriander (leaves) may facilitate the removal (chelation) of Aluminium from the body. references

Ginkgo biloba may help to minimize the Brain damage caused by exposure to Aluminium. references

Garlic may facilitate the excretion of Aluminium from the body. [more info]

These Substances may Counteract the Toxicity of Aluminium

Calcium may reduce the toxicity of Aluminium. references

Magnesium may reduce the toxicity of Aluminium (Aluminium's toxicity may be greater in the presence of Magnesium deficiency).

Brahmi may inhibit the ability of Aluminium to damage the Hippocampus of the Brain.

Cnidium may counteract Aluminium-induced Memory impairment (due to the Osthole content of Cnidium).

Sources of Aluminium

Aluminium Cans references

Aluminium Cookware



Pharmaceutical Drugs

Many Pharmaceutical Antacids contain the Aluminium Hydroxide form of Aluminium.

Aluminium is a component of Aspirin.

Cosmetics & Toiletries

Most commercial Antiperspirants contain Aluminium (in its Aluminium Chlorohydrate form) - Spray-on forms of commercial Antiperspirants are more toxic (due to Aluminium being absorbed into the body through the Olfactory System via residual vapors from Sprays - Aluminium is absorbed into the body more efficiently via the Olfactory system than via the Skin

Commercial Toothpaste often contains Aluminium.

Aluminium is commonly added to Baking Powders during their manufacturing process.

Aluminium is added to many forms of Cheese during the manufacturing process.

Aluminium is often added to refined Flour during the manufacturing process.

Aluminium is present in Table Salt (due to the manufacturing process for Table Salt).

Sea Vegetables are prone to contamination from Aluminium when they are harvested from Water that is polluted with Aluminium.

Aluminium is a common component of Dental Fillings.

Aluminium is a constituent of Tobacco smoke.

Aluminium Sulfate is used by many countries to remove fine particles from drinking Water

Aluminium may Interfere with these Substances

Aluminium may inhibit the activity of 2'3'-cyclic Nucleotide Phosphohydrolase.

Aluminium may inhibit the activity of Choline Acetylase.

Aluminium may inhibit the activity of Sodium/Potassium ATPase.



Aluminium may inhibit the activity of Tyrosine Hydroxylase.

Aluminium may inhibit the absorption of Calcium.

Aluminium may inhibit the absorption and utilization of Magnesium. Aluminium may inhibit the absorption of Phosphorus.

Aluminium may interfere with the synthesis of Acetylcholine

Aluminium may interfere with the function of Dopamine within the Brain. Aluminium may interfere with the function of Norepinephrine within the Brain.

Aluminium may bind to and damage the body's Deoxyribonucleic Acid (DNA).

Aluminium may reduce the transport of Choline into the Neurons.

Molecules in the body which are bound to Aluminium are no longer able to absorb Water, Oxygen or Nutrients from the Blood Vessels.

These Substances may Increase the Toxicity of Aluminium

Fluoride may increase the absorption and toxicity of Aluminium (especially when Fluoride in drinking Water combines with Aluminium in drinking Water to form Aluminium Fluoride): references

- In the presence of Fluoride, Aluminum leaches out of cookware. Boiling fluoridated tap water in an aluminum pan may leach up to 200 parts per million (ppm) of Aluminum into the Water in 10 minutes.

Forms of Aluminium

Aluminium Fluoride (also known as Fluoroaluminum complex (AlF₃) is formed when Aluminium in drinking Water bonds with Fluoride in drinking Water.

Aluminium Chlorohydrate is the form of Aluminium present in Antiperspirants.

Aluminium Hydroxide is a component of most Pharmaceutical Antacids.



Aluminium Sulfate is added to drinking Water in many countries as a purifier.

Sodium Aluminate is added to drinking Water in many countries as a means of preventing the buildup of Calcium and Magnesium deposits in Water pipes.

Bioavailability

Ingestion

Aluminium is absorbed poorly via the Intestines.

Aluminium is very readily absorbed via the Olfactory System (therefore Aluminium in spray-on Antiperspirants is absorbed into the body more efficiently than Aluminium in roll-on Antiperspirants).

Aluminium is poorly absorbed through the Skin.

Excretion

Aluminium is excreted from the body via the Kidneys - if Kidney function is sub-optimal Aluminium may be deposited in the Bones.

Biochemical Testing of Aluminium

Plasma Aluminium

The reference range for Plasma Aluminium varies between laboratories and countries. The following are representative values:

- <0.3 mmol per liter

Urinary Aluminium

The reference range for Urinary Aluminium varies between laboratories and countries. The following are representative values:

- <70 micrograms per gram of Urine Creatine (Charing Cross Hospital)