



Sources of Heavy Metal Exposure

Sources of Mercury Exposure

Mercury exists in three chemical forms each of which have specific effects on human health.

Methylmercury: absorbed through amalgam fillings, fish and shellfish.
 Elemental mercury: breathed in as a vapour.
 Organic and inorganic mercury compounds: are absorbed through the gastrointestinal tract.

| | |
|---|--|
| <p>Food Sources</p> <ul style="list-style-type: none"> • large predatory fish • shell fish • food grown in mercury contaminated soils • breast milk <p>Drinking Water</p> <ul style="list-style-type: none"> • low levels in drinking water <p>Dental</p> <ul style="list-style-type: none"> • amalgam fillings <p>Cigarette Smoke</p> <ul style="list-style-type: none"> • cigarette smoke • second-hand cigarette smoke <p>Consumer Products</p> <ul style="list-style-type: none"> • light bulbs | <p>Airborne Pollution</p> <ul style="list-style-type: none"> • coal burning power stations • emissions from iron and steel foundries <p>Automotive Uses</p> <ul style="list-style-type: none"> • automobile switches • car headlights • fluorescent background on dashboards • paint • seatbelt materials • carpeting • seat foam • steering wheel • dashboard • body panels • bumper |
|---|--|

Sources Of Lead Exposure

| |
|--|
| <p>Food Sources</p> <ul style="list-style-type: none"> • food grown on land contaminated by lead fall-out, lead contaminated super-phosphate, trace metal fertilisers or sewage sludge • fresh fruit and vegetables, lead especially high in spinach and silver-beet • eggs from poultry housed on contaminated soil • breast milk • PVC hose including food and beverage hose • lead crystal, leaded decals, lead glazed pottery and ceramics • soldered canned food seams – mostly ham and other non-cylindrical cans • old cutlery and crockery • pewter mugs or plates • lead foil tops covering the corks of wine bottles • painted china |
|--|

Drinking Water

- PVC water pipes
- old lead pipes

Health and Beauty Preparations

- calcium supplements made with lead contaminated bone meal
- surma or kohl eye liner and lip pencil
- hair colour restorer treatments

Cigarette Smoke

- cigarettes smoke
- second-hand cigarette smoke

Consumer Products

- toy soldiers and other models
- lead or pewter jewelry
- lamp stands and ashtrays
- the fish-eye contacts on light bulbs
- some imported crayons and chalk
- t-shirt transfers
- metalwork and glasswork crafts
- leaded glass for radiation shielding such as in TV tubes, TV and VDU screens
- electronic lead solder in appliances and computers
- pool cue chalk
- fishing sinkers and jigs

Airborne Pollution

- waste and emissions from ferrous and non-ferrous foundries
- ash and emissions from wood-burning
- emissions from metallurgical works and metal heat treating works
- volcanic eruptions
- waste and emissions from lead, silver and zinc mines and smelters
- ash and emissions from burning painted wood
- ash and emissions from coal-burning
- dust escape from demolition of buildings and other structures
- compounds for cloud-making

Painted Surfaces and Compounds

- pre-1970 furniture, toys and painted surfaces in houses
- playground equipment
- paintings and signs
- vehicles
- white-goods
- universal pink primer (red lead + white lead)
- lead compounds as coloured pigments
- vitreous enamel used to coat baths

Vehicle and Fuel Applications

- lead octane enhancer for automotive and motor-mower fuels
- sump-oil
- radiator solder
- PVC in vehicle interiors, e.g. mats
- PVC in oil and air filters
- auto body solder for panel beating
- lead-acid batteries for generators and automotive use (comprises 64% of world use of lead)
- PVC flexible bumper strip
- PVC body side moulding and mud flaps
- aviation fuel for non-jet engines

Plastics and chemicals

- pigments
- lubricants
- PVC piping
- PVC mini-blinds
- PVC coated wire
- PVC footwear
- PVC mouldings
- PVC vinyl coated fabrics eg seating, clothing, awnings, signs
- PVC film and sheets e.g. stationery folders, packaging, hospital bed sheeting, clothing
- lead oxide in glassmaking
- tile and other glazing compounds
- PVC coated electrical cable, e.g. Christmas light wires etc
- PVC cladding
- PVC solar tubing for heating swimming pools
- PVC flexible extrusion e.g. wall plugs, curtain rods, insulation, furniture trim
- PVC flooring
- lead compounds in rubber manufacture
- lead pigmented coloured glass

Building Materials

- sheet lead flashings
- lead head roof nails and lead washers for galvanised screws used on roofing iron
- old gas and water pipes
- lead in bronze or brass alloys for plumbing, valves or fixtures
- red lead as a sealant on the back of old linoleum
- wrought iron
- old glazing putty, white lead and linseed oil based putty
- radiation shielding eg hospital X-ray rooms, radon liners or electricity shields in houses
- damp courses
- lead solder for plumbing
- cable sheathing for telephone and power cables
- sound insulation
- lead-light
- pipe fittings and collapsible tubing

| | |
|--|--|
| <p>Inks and Dyes</p> <ul style="list-style-type: none"> • fabrics • old printing • leather tanning compounds • packaging • cheap coloured news print | <p>Some Other Sources</p> <ul style="list-style-type: none"> • explosives, e.g. cordite • ammunition • radiation shielding in nuclear war-ships and installations • sheet lead for radiation shielding, e.g. lead vests for dentists and radiologists |
|--|--|

Sources Of Cadmium Exposure

| | |
|--|--|
| <p>Food Sources</p> <ul style="list-style-type: none"> • rice and wheat grown in soil contaminated by sewage sludge, super phosphate fertilizers and irrigation water • large ocean fish such as tuna, codfish and haddock • organ meats such as liver and kidneys • breast milk • a diet high in refined foods as many processed foods are stripped of zinc and calcium in the refining process allowing cadmium to be readily absorbed by the body • when cadmium is used as a plating material in food-processing plants, it finds its way into processed food products • processed meats, refined grains, instant coffee and cola drinks are among the most common sources of cadmium toxicity • widespread use of white flour contributes to cadmium toxicity because of the high cadmium/zinc ratio • excessive carbohydrate intake reduces zinc levels which can aggravate cadmium toxicity • the solder used to seal some cans is a common source of cadmium <p>Drinking Water</p> <ul style="list-style-type: none"> • cadmium used in various industries eventually finds its way into many water supplies • soft water is more dangerous than hard water as the calcium in hard water has a protective effect against cadmium • cadmium is found in old galvanized pipes • new PVC plastic pipes are also a source of cadmium | <p>Industries</p> <p>Workers in these industries have a higher risk of exposure.</p> <ul style="list-style-type: none"> • processing of ores • batteries • semiconductors • electroplating • polishes • dental amalgams and appliances <p>Personal Products</p> <ul style="list-style-type: none"> • hair dye <p>Cigarette Smoke</p> <ul style="list-style-type: none"> • there are high levels of cadmium in cigarette smoke and smoking a packet of cigarettes will deposit 2 - 4 micrograms of cadmium into the smoker's lungs • cadmium is efficiently absorbed when inhaled • second-hand smoke contains cadmium <p>Airborne Pollution</p> <ul style="list-style-type: none"> • coal burning power stations • exhaust fumes • incineration of rubber goods, tyres, plastics and paints |
|--|--|

Sources of Aluminium Exposure

| | |
|---|---|
| <p>Food Sources</p> <ul style="list-style-type: none">• cake mixes• processed cheese• flour• baking powder• colouring agents• anti-caking agents• soy-based infant formula• milk-based infant formula• breast milk• aluminium cookware• aluminium cans• aluminium foil <p>Health and Beauty Preparations</p> <ul style="list-style-type: none">• some cosmetics• some anti-perspirants• some pharmaceuticals, e.g. antacids and buffered aspirin• some vaccines | <p>Drinking Water</p> <ul style="list-style-type: none">• some drinking water is processed with aluminium salts <p>Cigarette smoke</p> <ul style="list-style-type: none">• aluminium is highly concentrated in cigarettes• second hand cigarette smoke contains aluminium <p>Airborne Pollution</p> <ul style="list-style-type: none">• coal burning power stations• aluminium in dust from soil erosion and mining <p>Industries</p> <ul style="list-style-type: none">• bauxite mining and processing |
|---|---|