

Abridged List of Metals Used in Dentistry and Medicine
*Compiled by the International Academy of Oral Medicine and
 Toxicology (IAOMT)*
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Product	Metals
Dental Bridges, Crowns, Partial Dentures, and Implants	<ul style="list-style-type: none"> • These items can contain aluminum, chromium, cobalt, copper, gallium, gold, indium, iridium, iron, manganese, nickel, palladium, platinum, silver, titanium, vanadium and more.^{1 2 3 4} • Items made of cobalt-chromium-molybdenum steel contain those elements in addition to aluminum, nickel, titanium, and others.⁵ • Research has found that some of these dental materials can contain lead.⁶
Dental Fillings	<ul style="list-style-type: none"> • Amalgam (silver) fillings contain about 50% mercury mixed with copper, silver, and tin, and they can also contain zinc⁷ and other metals,⁸ including lead and cadmium.⁹ • Some composite fillings, as well as dental cements and root-fillings, can contain titanium dioxide.¹⁰ • Dental gold alloys can also contain copper, gallium, indium, iridium, palladium, nickel, silver, tin, titanium, and zinc,¹¹ as well as beryllium.¹²
Gynecologic Devices	<ul style="list-style-type: none"> • Some intrauterine devices (IUDs) contain copper,¹³ and possible contaminants include manganese, nickel, and zinc.¹⁴ • Permanent contraceptive devices and clips (i.e. tubal ligation) can contain nickel and titanium.¹⁵
Intravascular Devices (i.e. coronary stents, perforated foramen occluders, pacemakers, and implantable defibrillators)	<ul style="list-style-type: none"> • Cardiac/intravascular devices can be made of stainless steel¹⁶ ¹⁷ (which can contain chromium, manganese, molybdenum, and nickel¹⁸). • They can also be made of chromium, cobalt, molybdenum, and/or nitinol (which is 45% nickel and 55% titanium).¹⁹ • Stents can be coated in gold.²⁰ • Pacemakers can contain aluminum, nickel, and titanium,²¹ and can be coated in gold.²²
Medication	<ul style="list-style-type: none"> • Pills can contain titanium dioxide and other metal oxides.²³ • Antacids can contain aluminum.²⁴

Orthodontic Appliances (i.e. bands, braces, brackets, retainers, and wires)	<ul style="list-style-type: none"> • These can contain nickel^{25 26 27 28} and titanium.^{29 30} • They can also contain aluminum, chromium, cobalt, copper, iron, molybdenum, niobium, and vanadium,³¹ as well as silicon and other elements.³²
Orthopedic Implants (i.e. hip replacements, screws, nails, and clips)	<ul style="list-style-type: none"> • These often contain chromium, cobalt, nickel, and/or titanium.³³ • Items made with stainless steel³⁴ contain a large amount of nickel³⁵ with chromium, manganese, and molybdenum,³⁶ in addition to other elements.³⁷ • Items made with cobalt-chromium molybdenum steel contain those elements in addition to aluminum, iron, manganese, nickel, titanium, and tungsten.³⁸ • Items made with titanium can also contain aluminum, vanadium, trace amounts of nickel,³⁹ and other elements.⁴⁰ • Items made with nitinol contain nickel and titanium.⁴¹ • Items made with Vitallium™ contain cobalt, chromium, manganese, molybdenum, iron, and other elements.⁴²
Surgical Clips and Staples	<ul style="list-style-type: none"> • Items made with stainless steel can contain chromium, manganese, molybdenum, nickel, and other elements.⁴³ • Items made with titanium alloy contain aluminum, nickel, titanium, and vanadium.⁴⁴
Vaccines/Flu Shots/Immunoglobulin Preparations	<ul style="list-style-type: none"> • These can contain aluminum^{45 46} and/or mercury (as thimerosal).^{47 48 49}

Additional considerations for metal exposures:

- Cigarette smoke
- Coins
- Containers including beverage cans and canned food
- Cookware and utensils
- Cosmetic products
- Detergents
- Diet (i.e. fish containing mercury; foods high in nickel such as chocolate, nuts, oatmeal, soya beans, etc.)
- Eye drops, contact lens solution, and eyeglass frames
- Jewelry, belts, watches, accessories, etc.
- Occupational exposures
- Pipes for drinking water, etc.
- Pollution
- Sunscreen
- Toothpaste
- Well water
- Other consumer products

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