



Authoritative facts about the skin from the [New Zealand Dermatological Society Incorporated](#).

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Allergy to cobalt

What is cobalt and where is it found?

Cobalt is a metal found naturally in soil, dust, and seawater. It is usually found in association with [nickel](#). Cobalt and its salts have many uses, the table below shows some of the many sources of cobalt and where or how we may come into contact with them either at home or at work.

Home/personal sources	Work sources
<ul style="list-style-type: none"> • Cobalt blue pigment in porcelain, glass, pottery, ceramics and enamels • Cobalt blue in blue and green water colour paints and crayons • Metal-plated objects <ul style="list-style-type: none"> • Buckles • Buttons • Zippers • Snaps • Costume jewellery • Utensils • Tools • Medical uses <ul style="list-style-type: none"> • Vitamin B12 preparations for the treatment of anaemia • Metal prostheses • Dental plates • Hair dyes; cobalt pigment produces light brown shades of hair • Antiperspirant preparations 	<ul style="list-style-type: none"> • Cobalt used as binding agent in hard metals to create drills, cutting tools, mechanical parts • Cobalt naphthenate is a common catalyst in the manufacture of polyester resins • Manufacture of cobalt-containing alloys • As an oxidizing agent in automobile exhaust controls, in the rubber tire industry and in electroplating • Cement industry; cement contains cobalt oxides • Cobalt siccatives or driers are found in certain paints and varnishes • Binding agent in the carbide industry • Wet clay containing cobalt used by pottery workers

What are the reactions to cobalt allergy?

Reactions to contact with cobalt in an allergic individual include [allergic contact dermatitis](#) and irritant dermatitis. Vitamin B12 injections administered to allergic individuals may produce a red, tender and itchy area around the site of the injection. Oral ingestion of vitamin B12 is known to cause intractable hand eczema in some patients.

In many cases, allergic reactions are not caused solely by cobalt sensitisation. For example, metal objects almost always also contain nickel and in the cement industry nickel and chromium are present. Nickel and chromium are also potent sensitisers therefore; allergic reactions may not be due solely to cobalt but also to simultaneous specific allergy to [nickel](#) and [chromium](#).

Cobalt allergy may cause an [erythema multiforme](#)-like eruption. It may also cause an airborne contact dermatitis.

Am I allergic to cobalt?

Cobalt allergy is diagnosed from the clinical history and by performing special allergy tests, i.e. [patch tests](#).

Nickel and cobalt are always found together in alloys and salts because it is too costly and impracticable to separate these two metals. Thus patch testing should always include both cobalt and nickel. Unfortunately, patch test results with cobalt and nickel can be confusing as it is extremely difficult to obtain pure solutions of each individual metal. Cross-reaction between cobalt and nickel is not very frequent, as patch tests have shown several patients with strong reactions to cobalt but not to nickel. However, combined allergic reactions are not uncommon and represent simultaneous specific sensitisations to each individual metal as opposed to being cross-reactions. Intradermal testing with cobalt may also be performed to diagnose cobalt sensitivity. Current thinking is that a diagnosis of allergic dermatitis to cobalt is justified if the following criteria are matched.

Confirmed diagnosis of allergic cobalt dermatitis

- Patient actually exposed to cobalt
- Positive patch test to 2% cobalt chloride in aqueous solution
- Intracutaneous test with 1:1000 cobalt chloride gives a delayed tuberculin reaction in a nonatopic individual

Management of cobalt allergy

Identifying possible sources of contact and avoiding them is the only long-term management strategy for cobalt allergy. Once the dermatitis appears on the skin, treatment is as for any acute [dermatitis/eczema](#), i.e. [topical corticosteroids](#), emollients, treatment of any secondary bacterial infection (*Staphylococcus aureus*), etc.

Where avoidance is not achievable, several methods can be used to try to minimize exposure. Brief contact with metal devices is usually not a problem except in highly sensitive individuals.

Methods to minimize cobalt exposure

- Use metal instruments such as scissors, kitchen utensils and combs that have plastic or wooden handle grips
- If necessary, wear vinyl or rubber gloves to avoid contact (however, do not use for wet work as moisture increases the penetration of cobalt into the skin)
- Items such as keys can be coated with several layer of clear nail polish
- In the workplace, wear protective clothing and employ no-touch techniques

What should I do to avoid cobalt allergy?

In the workplace try to avoid exposure to cobalt, however this may not be practicable thus use measures to minimize exposure as described above. Identify potential sources of exposure using Material Safety Data Sheets; these are required for all chemicals and substances that you may come into contact with in the workplace. If you must use products that contain cobalt, wear gloves or other protective clothing to avoid contact with your skin.

Outside of the workplace, the best way to avoid cobalt allergy is by being aware of the possible sources of cobalt. Read product labels and do not use any that contain cobalt or any of its alternative names. If unsure ask your pharmacist for advice or a suitable alternative. Only use cosmetics, antiperspirants and hair dyes that you know do not contain cobalt. Avoid metallic costume jewellery. Sterling silver and platinum jewellery is usually tolerated.

Alert your doctor or dentist to the fact that you have an allergy to cobalt. Your dermatologist may have further specific advice, particularly if you are highly sensitive to cobalt.

Alternative names for cobalt

Cobalt is also known by several other names. These include:

- Cobalt dichloride, hexahydrate
- Cobalt (II) chloride-hexahydrate
- Cobalt blue
- Cobaltous chloride hexahydrate

Avoid all of these. At work, request a material safety data sheet to help identify alternatives that are safe hence avoiding contact with material containing cobalt.

Further information

CAS number: 7791-13-1

Appearance: Silvery grey, shiny, hard metal

Sensitizer: cobalt

Patch Test:

- 2% cobalt chloride in aqueous solution
- 2% cobalt sulphate in aqueous solution
- 5% cobalt naphthenate in aqueous solution

Sources of Exposure to Cobalt

- | | |
|---|---|
| <ul style="list-style-type: none"> • Alloys • Buttons • Buckles • Carbide • Ceramics • Cement • Clay • Cosmetics • Costume jewellery • Cutting tools • Dental plates • Detergents • Flypapers • Glass | <ul style="list-style-type: none"> • Hair dye • Kitchen utensils • Metal prostheses • Oils • Paints • Pottery • Polyester resin • Printing inks • Rock drills • Rubber tires • Tools • Vitamin B12 • Zippers |
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Reference

Book: [Fisher's Contact Dermatitis. Ed Rietschel RL, Fowler JF. Lippincott Williams & Wilkins 2001](#)

Related information

On DermNet NZ:

- [Dermatitis](#)
- [Allergic contact dermatitis](#)

- [Patch testing](#)

Other websites:

- [T.R.U.E. Tests](#): Cobalt dihydrochloride.
- [AllAllergy.Net](#): Allergy and intolerance information resource.
- [Allergy New Zealand](#)
- [Allergic contact dermatitis](#) - emedicine dermatology, the online textbook

Books:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.

If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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