

A close-up photograph of a bismuth crystal, showing its characteristic layered, metallic structure. The crystal is illuminated with a warm, golden-orange light, creating a shimmering, textured appearance. The background is blurred, emphasizing the sharp edges and facets of the crystal.

# Bismuth

## Exposure Routes & Health Effects

[www.toxtest.com.au](http://www.toxtest.com.au)

# Introduction

This report on possible Bismuth exposure routes and know health effects in humans of Bismuth, was last updated **August 2020**. While we have made great effort to research the literature, government, health, news and toxicology sources, the way metals (Bismuth) and other substances are extracted and used, changes continuously.

People can get a detectable Bismuth result when they have water, soil, dust, hair or other substances tested through [Toxtest](#) or another laboratory. **It is important to note** however, that detecting Bismuth in any substance we test does not mean that we will have symptoms or even experience harm. Adverse effects from Bismuth exposure depend on many factors within the individual, some of which include - the dose, the chronology of the exposure, your genetics, detoxification capacity, gut motility/health and perhaps most importantly, simultaneous exposure to other toxic substances.

## KEY

µg = microgram (1 millionth of a gram), mg = milligram (1 thousandth of a gram)

1 µg/gram = 1 mg/kg = 1 mg/Litre = 1 ppm

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# Bismuth Exposures

## Makeup and Cosmetics

Like lipstick and more. Click image for more info.

Note if you got a **high Bismuth reading in a Hair Test result** it is also important to consider the presence of Bismuth in Hair Dyes – particularly for men. See [Bismuth Patent, For Men](#) and [Covering Grey Hair](#). Click image below for more exposure examples of Bismuth in cosmetics.

General Information on Bismuth

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Bismuth is a metal found in many everyday products like makeup

Bi George, it's bismuth! | Bis...  
pinterest.com

How to Make Bismuth Cryst...  
thoughtco.com

Unique Options of Plastic Se...  
fashionshows.us

What are the Different Lipsti...  
wisegeek.com

Lip Shade Lipstick • Beauty ...  
raecosmetics.com

Allergy to Mineral Makeup | ...  
makeup.lovetoknow.com

What is in a Lipstick? :: Che...  
chemistryviews.org

Bismuth Toxicity - Chelation ...  
chelationcommunity.com

How to do light makeup at h...  
zuri.in

Bismuth Lesson for Kids: Us...  
study.com

General Information on Bism...  
psanalytical.com

None Of Your Bismuth botto...  
cosmeticsanctuary.com

## Bismuth in Gun Shot – As a Lead (Pb) alternative

The study confirms results from other studies showing that bismuth shot contains traces of lead that is deposited with bismuth in the target animal.

[Lead and Other Trace Elements in Danish Birds of Prey](#), Niels Kanstrup et al, 2019

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## Bismuth in Human Medicines

“Inorganic bismuth derivatives have good antibacterial properties and are considered to be only slightly toxic to humans because of their low uptake into human cells. Compounds containing bismuth are therefore widely used in medical applications. Bismuth-containing pharmaceuticals, partially in synergy with antibiotics, are already used or are being considered in the treatment of infections caused by certain bacteria, especially to eradicate *Helicobacter pylori*, *Pseudomonas aeruginosa*, *Burkholderia multivorans* and *B. cenocepacia*. However, careless use of bismuth containing pharmaceuticals can result in encephalopathy, renal failure and other adverse effects. Microbial methylation of bismuth by the human gut microbiota has recently been reported. As the lipophilicity and thus the membrane permeability of bismuth are increased by these methylation processes, the toxic effects on human cells and on members of the beneficial “physiological” gut microbiota must be considered in medical application of bismuth-containing drugs.” From

[Medical Use of Bismuth: the Two Sides of the Coin](#), Frank Thomas et al, 2011

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[Bismuth monograph](#) produced by staff of a National Poisons Information Service Centre in the United Kingdom.

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## Bismuth in Water

Some manufacturers use bismuth as a substitute in equipment for **potable water systems such as valves** to meet "lead-free" mandates in the U.S. (began in 2014). This is a fairly large application since it covers all residential and commercial building construction. In the early 1990s, researchers began to evaluate bismuth as a nontoxic replacement for lead in various applications.

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## Other Sources of Bismuth

Other Bismuth sources can include Wart treatments, Cosmetics, [Burn ointments](#), Antiseptic powders, [Dentistry](#), Superconductors

More on Burn Ointments & Neurotoxicity - [Bismuth-containing ointment](#) has been used for the dressing of wounds since World War I

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The [Bismuth Wiki article](#) contains a few others potential uses and sources of Bismuth like **grease lubricant**.

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Bismuth nanoflakes may be considered to develop newer and safer tools for [malaria vector control](#).

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## **Bismuth in Baby foods**

See - [Evaluation of the Content of Antimony, Arsenic, Bismuth, Selenium, Tellurium and Their Inorganic Forms in Commercially Baby Foods](#), M. Ruiz-de-Cenzano, et al, 2017

# Bismuth Health Effects



Bismuth crystals *Image from - <https://www.joom.com/en/products/5cf25f2c1436d40101f8a3f0>*

## Neurotoxicity

Abstract from article – “Bismuth encephalopathy- a rare complication of long-standing use of bismuth subsalicylate”, Cláudia Borbinha et al, 2019

Background: Drugs containing bismuth, although usually safe, may rarely cause **neurotoxicity**.

Case presentation: We describe the case of a 44-year-old woman treated with bismuth subsalicylate for about 20 years, who developed abnormal behaviour and postural instability in two weeks. On examination, she had greyish discoloration of teeth, was confused and presented generalized

myoclonic jerks. In the next days, her clinical condition deteriorated, with a reduction in alertness and more exuberant myoclonus. Brain MRI was unremarkable. CSF revealed mild elevation of protein content (47 mg/dL; reference range: 15-45 mg/dL) and elevation of white blood cell count (10/ $\mu$ L). Bismuth levels in urine (375  $\mu$ g/L), serum (260  $\mu$ g/L) and CSF (21.4  $\mu$ g/L) samples were highly above the threshold for toxicity. Following supportive treatment and bismuth discontinuation, she made a full recovery within weeks.

Conclusions: Although rare, **bismuth encephalopathy** should be considered in patients presenting with subacute encephalopathy and myoclonus. This encephalopathy can be subacute even after a chronic exposure. Cessation of bismuth can lead to a complete resolution in weeks.

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“An epidemic of **neurological toxicity** was reported in **France in the 1970’s** with prolonged bismuth treatment, usually bismuth subgallate and subnitrate. Such toxicity has been rare with bismuth subsalicylate and colloidal bismuth subcitrate. However, recent studies have demonstrated intestinal absorption of bismuth (about 0.2% of the ingested dose) and sequestration of this heavy metal in multiple tissue sites, even occurring with conventional dosing over a 6-week period. These findings have inspired recommendations that treatment periods with any bismuth-containing compound should last no longer than 6-6 weeks, followed by 6-week bismuth-free intervals.” From - Bismuth Therapy in Gastrointestinal Diseases, Sherwood I. Gorbach, 1990

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## Bismuth subsalicylate

is a Medication with other common names of

**Generic Name:** bismuth subsalicylate (BIZ muth sub sa LISS i late)

**Brand Name:** Bismarex, Bismatrol, Bismatrol Maximum Strength, Kaopectate, Kola-Pectin DS, Peptic Relief, Pepto-Bismol, Percy Medicine, Pink Bismuth, Soothe Caplets, Pepto-Bismol Maximum Strength, Maximum Strength Stress, Stress Maximum Strength, Kaopectate Extra Strength, Childrens Kaopectate, Maalox Total Stomach Relief, Kapectolin (New Formula), Kao-Tin Bismuth Subsalicylate Formula, Kaopectate Anti-Diarrheal Upset Stomach Reliever, K-Pek, Soothe Chewable, Soothe Regular Strength, Soothe Maximum Strength, Pepto-Bismol InstaCool  
Bismuth subsalicylate is used to treat diarrhea, nausea, heartburn, indigestion, gas, or upset stomach and may also be used for purposes not listed in the accompanying medication guide.

See <https://www.drugs.com/sfx/bismuth-subsalicylate-side-effects.html> for details of **all side effects**.

Also see **Bismuth subgallate** Side Effects here

<https://www.drugs.com/sfx/bismuth-subgallate-side-effects.html>

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**ABSTRACT:** “Bismuth salts, especially colloidal bismuth subcitrate (CBS) and bismuth subsalicylate, are widely used to treat peptic ulcers, functional dyspepsia, and chronic gastritis. Bismuth and most of its compounds are less toxic in comparison to other heavy metals like lead, antimony, cadmium, etc. The main organs involved in bismuth poisoning are **kidney, liver and bladder**. Skin and respiratory irritation can also follow exposure to respective organs. Large concentration of bismuth is contained in kidney

and is primarily excreted through this organ while lesser amounts of bismuth are excreted via saliva, milk and bile. Routes of exposure are skin/eye contact, inhalation and ingestion. The toxic results developed by Bismuth are serious ulcerative stomatitis, vague feeling of bodily discomfort, nausea, vomiting, loss of appetite and weight, pain in legs, arms and joints, depression and sleeplessness, pyorrhoea and exodermatitis. Management of the bismuth poisoning is done in the same line as any other heavy metals, with irrigation of the stomach (gastric lavage) and chelating agents.” From [Bismuth poisoning with analytical aspects and its management](#), AK Jaiswal et al, 2019

**Note that this article also contains useful recent (2019) information on adverse Bismuth health effects and mechanisms of toxicity.**

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How Bismuth works against [Helicobacter pylori infection](#).

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Example of [Bismuth Bullion Safety Data](#) sheet.

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Heavy Metal Poisoning or [Heavy Metal Toxicity](#) in general – includes a few facts about Bismuth.

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This study examines the potential **Ecotoxicology of Bismuth**.

[Characterization of Crude Oil, Asphaltenes Based on Bismuth \(Bi\), Thorium \(Th\) and Uranium \(U\) Levels: Potential Environmental Impact](#), Amr Abd Elhameed et al, 2016