

Ban beryllium in dentistry

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[Release](#)

Introduction

You don't have to work in a beryllium factory to get beryllium disease.

Anybody exposed to beryllium dust or fumes can get it. Some contract workers at beryllium plants, automotive manufacturing workers, aerospace workers, dental lab technicians, and those involved in recycling computers, cell phones and other electronic devices have developed beryllium disease.

Brush Wellman, Inc., headquartered in Cleveland, is the largest beryllium producer in the country. A 1997 National Institute of Occupational Safety and Health (NIOSH) study found that nearly 10% of Brush's workforce at their Elmore, Ohio plant either has beryllium disease or has a blood condition indicating they could develop the disease.

Beryllium is a naturally-occurring material. It is a hard, lightweight metal used to make military hardware, cars and trucks, computers, cell phones, and dental work-specifically crowns, bridges, and dental plates.

People exposed to beryllium dust or fumes can develop chronic beryllium disease. Beryllium disease is incurable and often fatal. Symptoms include cough, shortness of breath, fatigue, weight loss, fevers, and night sweats. Beryllium disease can develop in a short period after initial exposure or remain latent for up to thirty years.

Because the symptoms of beryllium disease are similar to those of other illnesses, and because so few physicians know anything about the illness and who is in danger from exposure, the disease often goes misdiagnosed. To determine if someone is in danger of developing beryllium disease, their doctor can give a blood test, beryllium lymphocyte proliferation test (BeLPT,) to screen workers for the first invisible signs of the disease. To diagnose the disease in beryllium sensitized people, they must undergo a series of tests, including lung biopsies and bronchoalveolar lavage.

This report outlines the dangers faced by dental lab technicians working with beryllium alloys. The Citizens Policy Center, Ohio Citizen Action's research and education affiliate, surveyed 51 labs in the Cleveland area to find out how often beryllium is used and collected Material Safety Data Sheets from 5 dental lab suppliers.

Problem

In dentistry, beryllium is used in a nickel alloy as a cheaper alternative to precious metals. The nickel alloy typically contains 1% - 2% beryllium. Although the beryllium composition is low, the risk to dental health professionals who grind, machine or polish the alloy is grave.

Thousands of dental laboratory employees, primarily technicians, are being exposed to beryllium dust and fumes. Many are not being told the truth about its dangers. Many are being deceived by disclosures that minimize its dangers. Indeed, many others are being outright lied

to by being told that exposure to beryllium is not the menace that scientists and doctors know it to be.

Although there has been information published in medical literature regarding the dangers of beryllium for workers in the dental industry, this information has likely not been seen by those whose health is most threatened-the laboratory technicians.

A 1993 article in the *American Review of Respiratory Disease* reported, "With the widespread introduction of beryllium into the dental industry, a large number of these workers are at risk for the development of chronic beryllium disease. Since up to 5% of exposed beryllium workers may develop chronic beryllium disease, approximately 2,200 dental laboratory technicians in the United States could potentially develop this disorder if proper measures are not taken to minimize exposure. Because most dental laboratories employ fewer than 10 individuals, these laboratories, although not exempt, are not routinely inspected for compliance with OSHA regulations. Similar risks to dental laboratory technicians exist outside the United States. In a recent survey of over 5,000 technicians in Germany, 21% reported a history of beryllium exposure."

("Chronic Beryllium Disease in a Dental Laboratory Technician," Robert Kotloff, Paul Richman, Kathleen Greenacre, and Milton Rossman, *American Review of Respiratory Disease*, Vol 147. pp 205-207, 1993).

The information most likely seen by the laboratory worker is what is written in the Material Safety Data Sheet, provided by the dental laboratory supplier, or information found in trade publications. Neither of these sources of information are providing adequate warnings to dental workers.

In response to ABC's "20/20" segment on beryllium disease in April 2000, a dental lab manager contacted the National Association of Dental Laboratories (NADL) about the potential dangers of using beryllium-containing alloys. Albino Perez, Chairman of the NADL Health & Safety Committee, wrote in reply to the concern, "Comparing the use of beryllium in the dental laboratory with the same level of potential hazard as an alloy manufacturing company is inaccurate and misleading, since the amounts of beryllium that we use and process are basically trace elements in much smaller quantities, even in large laboratories, compared to an alloy manufacturing company. The use of space-age breathing devices is not needed, nor any undue worry when using beryllium in our laboratories as long as we follow proper protocol," (*Journal of Dental Technology*, June, 2000, Volume 17, Number 5).

At least two dental laboratory technicians have already been diagnosed with beryllium disease. Both worked with 1%-2% beryllium alloys. In a [letter to Ohio Citizen Action dated January 30, 2001](#), Dr. Lee Newman, a beryllium disease expert from the National Jewish Medical and Research Center and one of the dental lab technician's physician, wrote, "I fear that there are many other such cases like hers in the U.S. dental industry and that action must be taken to raise awareness of the hazards of beryllium in this segment of the American workforce."

At least one individual with beryllium-dental work has become beryllium sensitized.

Material Safety Data Sheets (MSDS)

The federal Occupational Safety and Health Administration (OSHA) oversees the Hazard Communication Standard. This standard is based on the concept that workers have the need and the right to know about the hazardous materials they are exposed to in the workplace.

Under the standard, the manufacturer, importer or distributor of a hazardous material must label each container holding the material. The hazardous information must be transmitted on a Material Safety Data Sheet to the customer at the time of first shipment of the product.

MSDSs must contain the following information:

- Identity of chemical used on the label
- Physical and chemical characteristics
- Physical hazards (such as potential for fire or explosion)
- Health hazards
- Primary routes of entry
- OSHA permissible exposure limit and any other exposure limit information known by manufacturer, importer, or employer preparing the MSDS
- Whether the chemical is listed in the National Toxicology Program Annual Report on Carcinogens, or if the International Agency for Research on Cancer (IARC) or OSHA recognizes the material as a potential carcinogen
- Any general applicable precautions for safe handling and use;
- Any general applicable control measures
- Emergency and first aid precautions
- Date the MSDS was prepared or last updated, and
- Name and contact information of responsible party preparing or distributing MSDS (29 CFR 1910.1200).

The Citizens Policy Center collected five MSDSs for beryllium-containing alloys from dental laboratories and dental laboratory suppliers. All five MSDSs were distributed by dental laboratory suppliers who sell beryllium-containing products - the Argen Corporation, Jeneric/Pentron, Inc., Speedent Dental Supplies, Jack C. Silicox Ltd., and Brush Wellman, Inc. The Center received the MSDS from Speedent Dental Supplies after a staff member ordered a free sample of a nickel-chromium-beryllium alloy over the internet from Speedent.

Four of the five MSDSs collected by the Citizens Policy Center fail to provide sufficient information about the two major health hazards posed by beryllium-beryllium disease and cancer.

Inhaling beryllium dust or fumes is known to cause beryllium disease in some people. Four of the five MSDSs collected by the Center neglected to mention chronic beryllium disease by name, and instead wrote vague descriptions of the illness:

- Jeneric/Pentron Inc. and Speedent Dental supplies said beryllium is "a suspected cause of progressive lung damage & disease"
- Argen Corporation said breathing dust from the alloy "may cause irritation of the upper respiratory tract"
- Jack C. Silicox Ltd said the alloy is "non-toxic and no residual injury is expected from handling," and "when melted or ground in the dental laboratory, presents no health hazard if proper ventilation and safety equipment is used as per state and local regulations."

The MSDS for nickel-beryllium dental alloy from Brush Wellman, Inc. said, "Inhaling particulate containing beryllium may cause a serious, chronic lung disease called chronic beryllium disease (CBD) in some individuals. Over time lung disease can be fatal." Brush also provides a detailed

description of the illness, notification that the disease is incurable, and a note to physicians about treating the symptoms of the illness.

There are two classifications for carcinogens recognized by the National Toxicology Program, a federal program under the National Institute of Environmental Health Science:

1. "Known to be carcinogens in humans" - sufficient evidence of carcinogenicity from studies in humans which indicates a relationship between the agent and human cancer.
2. "May reasonably be anticipated to be human carcinogens" - limited evidence of carcinogenicity from studies in humans but alternative explanations, such as chance or bias, could not adequately be excluded or sufficient evidence of carcinogenicity from studies in experimental animals which indicate an increased incidence of malignant tumors.

The World Health Organization's International Agency for Research on Cancer lists beryllium as a "known human carcinogen." The National Toxicology Program lists beryllium as "reasonably anticipated to be a human carcinogen." Four of the five MSDSs failed to meet the cancer warning required by federal law:

- Argen Corporation does not mention carcinogenicity at all;
- Jack C Silicox said beryllium has been "recognized as suspect carcinogen by IARC;"
- Jeneric/Pentron Inc. and Speedent Dental Supplies said beryllium is a "possible carcinogen."

The new MSDS from Brush Wellman, Inc. clearly notes that the IARC lists beryllium as a known human carcinogen and the NTP lists beryllium as reasonably anticipated to be a human carcinogen.

Speedent Dental Supplies, Jeneric/Pentron, Argen Corporation, and Jack C Silicox Ltd have clearly violated both the letter and the spirit of the law.

Survey

The Citizens Policy Center contacted fifty-one dental laboratories in the Cleveland area. The [survey](#) was based on conversations between the Center's staff and dental laboratory employees or owners. Of the fifty-one laboratories we attempted to contact, we were successful in having conversations with thirty-six. In addition, two laboratories filled out written surveys. The survey found --

- Eleven dental laboratories admitted to using beryllium alloys.
- An additional six labs previously used beryllium alloys, but do so no longer.

The Citizens Policy Center used the American Business Database to estimate the number of workers employed at these dental labs. Of the thirty-eight dental laboratories we spoke with, there are an estimated 341 employees. Of the eleven laboratories still using beryllium, an estimated 196 employees may have been exposed to beryllium, or, 57% of the employees for whom we have any information may have been exposed. In 1988, The U.S. Department of Labor estimated there were approximately 44,000 dental lab technicians working in the country.

Recommendations

Based on the evidence, the Citizens Policy Center recommends an immediate moratorium on beryllium use in the dental industry. Specifically -

1. Brush Wellman should stop manufacturing beryllium dental alloys, stop marketing this metal to the dental industry, and refuse to sell the metal to the dental industry.

2. The American Dental Association and the National Association of Dental Laboratories should call for an immediate ban on all beryllium-containing dental products.
3. Dentists should stop ordering and using any beryllium-containing products.
4. Dental laboratories should immediately identify and use alternatives to beryllium alloys and stop using all beryllium containing alloys.
5. Dental laboratory suppliers should pull all beryllium inventory and immediately begin marketing beryllium alloy alternatives.

Brush Wellman, Inc. and all dental laboratory suppliers distributing beryllium alloys should immediately offer medical testing to all dental laboratories employees who could have been exposed to beryllium.

The National Association of Dental Laboratories and the American Dental Association should standardize the hazard communications within the industry to ensure all employees in the dental industry are receiving accurate, honest information about the materials they work with.

The Occupational Safety and Health Administration should increase inspections of dental laboratories and conduct a formal survey to determine how many dental laboratory employees have been exposed to beryllium.

Supplements

- Material Safety Data Sheets from [Argen Corporation](#) (196KB .pdf), [Brush Wellman Inc.](#), [Jeneric/Pentron Inc.](#) (207KB .pdf), [Speedent Dental Supplies](#) (137KB .pdf), and [Jack C. Silicox Ltd.](#) (262KB .pdf)
- [List of dental laboratories surveyed](#) .
- "[Chronic Beryllium Disease in a Dental Laboratory Technician](#)," Robert Kotloff, Paul Richman, Kathleen Greenacre, and Milton Rossman, *American Review of Respiratory Disease*, Vol 147. pp 205-207, 1993 (1,023KB .pdf).
- [Letter from Dr. Lee Newman to Ohio Citizen Action](#), January 30, 2001.
- "[Preventing adverse health effects from exposure to beryllium on the job](#)," Hazard Information Bulletin, Sep 20, 1999, Occupational Safety and Health Administration, U.S. Department of Labor.
- [Ohio Citizen Action letter to the U.S. Occupational Safety and Health Administration](#), February 20, 2001.

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