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Facts About Beryllium Disease

☑ What is Beryllium?

Beryllium is a naturally occurring metal. It is found in beryl and bertrandite rock. Beryllium is very lightweight and hard. It is a good electrical and thermal conductor and is non-magnetic. These properties make beryllium suitable for use in many industries.

These include:

- **Metal working** (pure beryllium, copper, aluminum, nickel and magnesium alloys, jet brake pads, aerospace components)
- **Ceramic manufacturing** (semi-conductor chips, ignition modules, crucibles, jet engine blades, rocket covers)
- **Electronics** (transistors, heat sinks, x-ray windows, computer and telecommunication parts and automotive parts)
- **Atomic energy and nuclear weapons industries** (heat shields, nuclear reactors, nuclear weapons)
- **Laboratory work** (research and development, metallurgy, chemistry)
- **Extraction** (ore and scrap metal)
- **Dental work** (alloys in crowns, bridges, dental plates)
- **Recycling** (computers, electronics, copper-alloy tubing, rod and wire)
- Prior to 1951, it was used in fluorescent lamp work.

☑ What is Beryllium Disease (Berylliosis)?

Beryllium disease often affects the lungs and immune system. The disease occurs when people inhale beryllium dust or fumes. Skin disease with poor wound healing and rash or wart-like bumps can also occur. This might be another route for becoming allergic to beryllium. A person can develop beryllium disease even after being away from the beryllium industry for many years. There are two major forms of beryllium disease:

- **Acute Beryllium Disease** usually has a quick onset and resembles pneumonia or bronchitis. It is now rare due to improved industrial protective measures designed to reduce beryllium exposure levels.

Chronic Beryllium Disease ("Chronic Berylliosis") has a slower onset. It still occurs in 2-6% of exposed people. It is caused by an allergic reaction to beryllium. Even brief or small exposures can lead to this disease.

Other beryllium-related disorders include dermatitis, skin granulomas, liver, spleen, heart, conjunctive (eye) and kidney involvement. These often occur in the presence of the chronic lung disease.

Does beryllium cause cancer?

Beryllium has been shown to cause cancer in humans and in many species of animals. Workers in some beryllium producing facilities have had an increased rate of lung cancer, as have beryllium patients whose cases were reported in the U.S. Beryllium Case Registry. Beryllium has been classified as a human carcinogen by the International Agency for Research on Cancer (IARC).

What Are My Chances of Getting Beryllium Disease?

Between 2-6% of exposed people will develop beryllium disease. However, certain work tasks have been associated with disease rates as high as 20%. Beryllium disease occurs among people exposed to dust or fumes from beryllium metal, metal oxides, alloys, ceramics or salts. Even very small amounts of exposure to beryllium can cause disease in some people. Genetic research has shown that about 45% of the population has a genetic marker that has been associated with susceptibility to disease. Disease can occur even in people with no known genetic susceptibility. You are at risk of developing beryllium sensitization even after you leave beryllium exposure. The risk continues the rest of your life, even if you tested normal for beryllium sensitization at one time.

What are the Signs and Symptoms of Beryllium Disease?

Some symptoms that you may notice with beryllium disease include:

- Cough
- Shortness of breath, often with activity
- Fatigue
- Weight loss and/or loss of appetite
- Fevers
- Night sweats
- Signs of beryllium disease that your doctor may notice include:
 - Abnormal lung sounds heard with a stethoscope ("crackles")
 - Many small lung scars seen on a chest x-ray
 - Abnormal breathing tests (pulmonary function tests and oxygen measures)
 - Allergy (sensitization) to beryllium, which is measured in the blood or in lung washings. The test called the **beryllium lymphocyte proliferation test (BeLPT)**.
 - A type of scar called a granuloma, found in lung or skin tissue when biopsied and examined under a microscope.

If you have been exposed to beryllium and develop an unexplained cough, shortness of breath, fatigue or a skin rash, you should inform your doctor of your past beryllium exposure. You may also seek information from a doctor who specializes in occupational

lung diseases.

☑ How do I Find Out if I Have Beryllium Disease?

Screening for beryllium disease usually begins with:

- A chest x-ray
- A blood test for beryllium sensitization (BeLPT)

The blood test detects abnormalities earlier than breathing tests or chest x-rays. It is available at National Jewish Health. This test is not routinely done in other medical laboratories. It is done in a few centers that study and treat patients with beryllium disease. Doctors and patients may order the test from any place where overnight courier service to Denver, Colorado is available, including overseas.

For information on ordering the beryllium lymphocyte proliferation test (BeLPT), contact the Clinical Immunology Laboratory at National Jewish Health at (303) 398-1344.

☑ What is the Treatment of Chronic Beryllium Disease?

- **Treatment is very effective** in controlling the disease; however, a complete cure with or without treatment is rare.
- Patients who are **sensitized to beryllium**, but **do not yet have the disease** do not need treatment. However, they do need to be checked by a doctor regularly for signs of disease.
- Patients who have **early beryllium disease**, but **do not yet have symptoms**, might not require treatment right away. However, they need to be checked by a doctor regularly. Some people who are detected at the early stages may go many years without needing treatment.
- Patients with **beryllium disease who do have symptoms and abnormal breathing tests** are usually treated with prednisone. This is a type of corticosteroid that fights inflammation. Treatment with this medication often stabilizes the disease and improves symptoms. Other immune suppressing medicines may also help.
- Beryllium particles imbedded in the skin often must be removed before skin wounds will heal.

☑ How Does Beryllium Disease Progress?

Beryllium sensitization often leads to disease, even in people who are no longer working with beryllium. Most people with beryllium sensitization have granuloma scars in their lungs, and sometimes in other organs also. In some people, the disease progresses very slowly over many years. In others it may progress more quickly. The onset of symptoms after the first beryllium exposure can vary greatly. The time between first exposure to beryllium and the onset of symptoms can vary from a few months to forty years. Once a person has been exposed to beryllium, there is a lifelong risk of developing the disease.

☑ What Can I Do to Avoid Beryllium Exposure?

It is not possible to determine your exact risk for developing beryllium disease. However here are some general guidelines that you can follow to minimize your exposure.

- Avoid breathing beryllium dust or fumes by working in well-ventilated, well-exhausted areas where beryllium air monitoring is done routinely. Use all ventilation and exhaust equipment available in order to reduce exposures to the lowest possible level.
- Whenever possible, work with non-beryllium metals, alloys, ceramics and salts.
- Do not eat, drink or smoke in areas where beryllium is in use.
- Before entering work areas where beryllium is used, change into work clothes, including shirt, pants and shoes. At the end of the work shift take a shower and thoroughly clean your hands and hair before changing into street clothing. Leave all beryllium-contaminated clothing at work.
- Use approved respirators for tasks that may result in high exposures.
- Minimize even “bystander” indirect exposures to beryllium, by staying out of areas where beryllium dust or fumes may be generated.
- Avoid generating beryllium dust unless the process is well protected and has been sampled for exposure levels.
- Try not to disturb settled dust, unless you are properly protected. Avoid using air hose to clean beryllium parts or contaminated machinery. Avoid all dry sweeping or other activities that can put microscopic beryllium dust particles into the air.

National Jewish Health offers a comprehensive beryllium screening and surveillance program to help patients, doctors and employers manage beryllium-related health issues. Physicians with expertise in identification and treatment of beryllium disease may be consulted through the Division of Environmental and Occupational Health Sciences at National Jewish Health in Denver, Colorado. To consult with a physician, or for more information on the beryllium program, please call (303) 398-1723.

To speak with a nurse, call the LUNG LINE[®] Information Service at National Jewish Health, Monday through Friday from 8:00 AM to 5:00 PM (Mountain Time) at 1-800-222-LUNG.

Note: This information is provided to you as an educational service of LUNG LINE[®]. It is not meant to be a substitute for consulting with your own physician.

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