

TerranearPMC Safety Share

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Week of June 24, 2019 – Be-LPTs

Persons assigned to work at sites where there is a recognized exposure to beryllium – based on airborne inhalation and/or skin contact – are required to participate in a specific medical surveillance program, which is in addition to a typical fit-for-duty physical for working at a hazardous waste site or treatment, storage and disposal facility. The specific regulations are the OSHA standards for general industry and construction; 29 CFR 1910.1024 and 29 CFR 1926.1124, respectively, and the DOE “Chronic Beryllium Disease Prevention Program, 10 CFR 850.

Without a doubt, the most significant aspect of a medical surveillance program for beryllium work is the beryllium lymphocyte proliferation test or Be-LPT. The purpose of a Be-LPT is to determine if a person has become sensitized to beryllium; meaning a person's immune system will produce an over-reaction to an exposure to beryllium and typically occurs as a result of previous exposures. Being sensitized to beryllium does not mean a person has contracted chronic beryllium disease (CBD) – a serious condition that can lead to debilitating health effects - but rather an indication that a person's susceptibility to contract CBD is substantially increased. In addition, a person where the Be-LPT shows negative results and, therefore, not classified as being sensitive to beryllium, contracting CBD is still a possibility.

The Be-LPT is designed to identify workers that, should they receive a continuous exposure to beryllium, have a likelihood to contract CBD greater than someone who is not sensitized. Should a worker become sensitized, that person has the right to be transferred to another project or work location where there is no beryllium exposure – without any consequence to that person's pay or seniority within the organization. However, the worker still has the option to continue work in the original work location where beryllium has been identified. Under this type of circumstance, the employer would need to involve human resources, so all parties understand the risks for continued work in such a location while the employee signs a statement that he/she understands and accepts the risks.

The actual Be-LPT is a test where beryllium is introduced into a worker's blood sample where the number of lymphocytes is compared to a blood sample – from the same worker- where beryllium was not introduced. A comparison between the two samples is conducted to determine if there is a significant difference in the number of lymphocytes. When there are more lymphocytes in the beryllium-containing sample than the non-beryllium sample, then, there is a strong likelihood that the patient is sensitized to beryllium.

Lymphocytes are white blood cells that are also one of the body's main types of immune cells. They are made in the bone marrow and found in the blood and lymph tissue. These cells work to defend the body against foreign substances, such as bacteria, viruses, and cancer cells. The specific lymphocyte cells associated with CBD are T cells. When beryllium (the foreign agent) is recognized in the lungs, the T-cells (lymphocytes) proliferate, and form T-cell clones. These clones then release proinflammatory cytokines proteins (proteins that mediate and regulate immunity, inflammation and blood cell formation) which, in turn, amplify the immune response, resulting in the formation of granulomas. Granulomas are masses of granulation tissue (typically produced in response to infection, inflammation, or the presence of a foreign substance). Through the continuous presence of granulomas,



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scaring (or fibrosis) of lung tissue results, thus rendering a compromised capacity for the respiratory system to function properly.

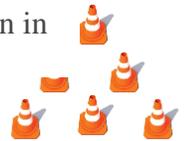
There is no cure for CBD. Treatment for CBD can vary for each patient, depending on the severity of the disease. Treatment may include corticosteroids, oxygen, and other means to ease symptoms or slow the disease progression.

Per OSHA regulations (29 CFR 1910.1024 and 29 CFR 1926.1124) employers must offer sensitized workers a physical examination every 2 years performed under the direction of a licensed physician. For DOE-related projects, the responsible employer must provide beryllium workers (i.e. persons performing beryllium work) a medical evaluation annually, while those that have had previous work with beryllium (i.e. beryllium-associated workers) are offered a medical evaluation every three years. The periodic medical evaluation must include:

- A detailed medical and work history with emphasis on past, present, and anticipated future exposure to beryllium;
- A respiratory symptoms questionnaire;
- A physical examination with emphasis on the respiratory system;
- A Be-LPT; and
- Any other medical evaluations deemed appropriate by the examining physician for evaluating beryllium-related health effects.
- In addition, the responsible employer must provide to beryllium-associated workers a chest radiograph every five years.

Studies have shown that on average, 1 – 6 percent of exposed workers develop beryllium sensitization. And once a Be-LPT verifies sensitivity, there are a few medical facilities that have the expertise to perform tests to determine if sensitization has advanced to CBD.

Because the Be-LPT can result in both false positive and negative analysis, the procedure does provide for a contingency. Should results indicate positive (meaning an individual has been identified as sensitized to beryllium) a duplicate test is then offered. Blood is once again collected, and the laboratory conducts the Be-LPT. Should this set of results indicate positive results, then the worker is confirmed as sensitized. If results are negative, then it is concluded the worker is not sensitized. As a prudent measure, workers who are considered beryllium workers will continue to participate in this program, where the frequency is determined by either DOE or OSHA regulations (i.e. annually or semi-annually). DOE workers that are no longer working with beryllium have the option to remain in the beryllium surveillance program, opting to have a Be-LPT every three years.



Whenever you find yourself on the side of the majority, it is time to pause and reflect - Mark Twain

