



Beryllium Science & Technology Association

Epidemiology studies on beryllium have always been subject to varying opinions

Studies by Levy, Brown and Deubner provided evidence that exposure to beryllium does not represent a significant risk of cancer to humans. The 1992 Ward study finding of a “modest excess of lung cancer” has been used to support cancer classifications for beryllium by organizations such as the NTP and IARC. A 2002 Levy study reanalyzed the Ward data using more relevant local cancer rates and three common smoking adjustments, and confirmed Ward’s finding by concluding that “with smoking adjustment there was not an overall excess of lung cancer in the eight cohorts of beryllium workers.” A 2001 study by Sanderson has been used to try to demonstrate a beryllium exposure response relationship for lung cancer. Both the 2007 Levy and 2007 Deubner studies identified a significant methodological error in the Sanderson study which negates the use of Sanderson as a dose/response cancer link for beryllium. Levy’s reanalysis correcting the error in the Sanderson study found that the lung cancer in this population was not associated at all with beryllium exposure, whether defined as time worked, or cumulative, average or maximum exposure. Deubner confirms the methodological error identified by Levy using repeated data simulations

The most recent studies indicate beryllium does not cause cancer

In a study by K. Rothman, it was concluded that “Simulations and reanalysis show that much of the reported association with lagged exposure is attributable to confounding by year of birth and year of hire. Lagging changes the exposure variable and can thus lead to changes in the amount of confounding.” This study suggests that the previous studies that suggested a cancer risk did not account for factors that could influence the study conclusions.

In a study of the United Kingdom’s Beryllium Registry that includes all cases of beryllium disease or suspected beryllium disease from 1945 to 1993, it was simply stated in the study report that, “There were no cases of cancer.”

A Study by Levy 2009, concluded “ The patterns observed provide little support for an association of lung cancer with beryllium work factors. This result is likely due to the absence in the original study of a significant overall excess of lung cancer after smoking adjustment J Occup Environ Med. 2009;51:480-486.

Strupp presented new research results in two papers on beryllium metal. The new studies were generated in accord with OECD standards and GLP requirements in order to comply with REACH. The new studies allow a scientific interpretation of the complex database that led to decades of erroneous conclusions that the toxicity of beryllium metal (which is commercially available) and soluble beryllium compounds (not commercially available) are the same. A detailed quality analysis of all of the available literature, using a globally accepted protocol, clearly demonstrated that the existing animal data on carcinogenic properties is conclusive only for rats and not for any other species. The author emphasized the well known fact that the rat has a propensity to

develop cancers and is not a good model for predicting carcinogenicity in humans. Strupp highlighted the fact that the epidemiology focuses on the same cohort (highly exposed beryllium production workers) and depending on the reviewer an excess cancer risk is found or not found. The new studies by Strupp, showed that beryllium metal does not interact with DNA and produce mutations, does not cause structural chromosomal aberrations, or forward gene mutations in mammalian cells. The results showed that beryllium metal did not cause DNA damage.

Data from European disease registries and leading medical practitioners does not identify a link between beryllium exposure and lung cancer. In a report by the Schweizerische Unfallversicherungsanstalt, no lung cancer cases were observed in an occupationally beryllium-exposed population that was followed for over 20 years. A manuscript prepared by the European Commission on beryllium in relation to occupational diseases (Information Notices on Occupational Diseases: A Guide to Diagnosis, 2009) states that: "The causal relationship between prolonged or repeated exposure to beryllium and the occurrence of bronchial cancer has not been firmly established, and due to the multi-causality of the occurrence of this type of cancer, the recognition of the occupational origin must lie on a thorough assessment based on rigorous scientific criteria taking into account all possible etiologies. Each case must therefore be considered separately."

Beryllium was also evaluated during the recent review of the European Cancer Directive for the European Commission under their review of 25 substances for the Directive 2004/37/EC. The report stated "there was little evidence for any important health impact from current or recent past exposures in the EU"

BeST is Working to have the Classification Corrected in the EU

The global producers who were required by REACH to submit a registration dossier and agree on a classification, all concluded that beryllium metal was not properly classified and have been working with member states in the EU to have beryllium metal reclassified.

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