

Identifying an Appropriate Occupational Exposure Limit (OEL) for Beryllium: Data Gaps and Current Research Initiatives

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The occupational exposure limit of $2.0 \mu\text{g}/\text{m}^3$ for beryllium has been used in the workplace since the late 1940s. In particular, the adequacy of the American Conference of Governmental Industrial Hygienists[®] (ACGIH[®]) Threshold Limit Value[®] (TLV[®]) for beryllium has recently come into question. The symposium "Beryllium: Effect on Worker Health" was convened in September 1999, to bring together leading scientists to present and discuss current research activities on beryllium exposure and chronic beryllium disease (CBD). One of the key questions to be resolved at the symposium was, "Is there a sufficient understanding of exposure and the cause of CBD that would allow us to develop a TLV that we believe would prevent disease?" Seven scientists presented information regarding the current understanding of the disease, possible causes, and ongoing research. The topics were (1) biomonitoring approaches and their relationship with clinical effects, (2) historical and current exposure assessments, (3) sampling methods and aerosol characterization, and (4) epidemiology. Six basic hypotheses regarding the relationship between exposure to beryllium and CBD were generated from the information presented at the symposium. The six hypotheses that are related to issues such as beryllium form, particle size, industrial hygiene practices, extrapulmonary routes of exposure, and genetic susceptibility also appear to be the focus of ongoing and likely future research initiatives. This article summarizes both the presentations made at the meeting and the hypotheses generated. It is expected that an understanding of these issues should explain the inconsistent dose-response relationship observed between exposure and CBD. The ongoing and planned research is anticipated to provide sufficient data within two to three years to develop one or more scientifically sound TLVs for the different chemical forms of beryllium.

Keywords Beryllium, Chronic Beryllium Disease, Beryllium Sensitization, Exposure Assessment, Blood Lymphocyte Proliferation Test, Biomonitoring, Threshold Limit Value