A Meta-Analysis of Paraoccupational Asbestos Exposures from Occupational Simulation Studies of Asbestos-Containing Encapsulated Products

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Abstract:
Paraoccupational exposures and asbestos-related lung disease among family members often involve laundering clothing worn by a working family member who experienced significant asbestos exposure themselves. In most household cases, workers who bring asbestos home were exposed to raw asbestos or friable asbestos-containing products at relatively high concentrations in mining, manufacturing or shipyard workplace settings and most often involved amphiboles or amphibole-contaminated chrysotile. In contrast, handling chrysotile-containing encapsulated asbestos products (e.g., gaskets, packing, brakes, clutches) result in not only low worker exposures, but also low or negligible airborne asbestos concentrations when handling work clothes worn during these activities. Simulation studies have attempted to characterize potential paraoccupational exposures after working with a variety of asbestos-containing encapsulated products. A meta-analysis was conducted of 5 simulation studies to determine whether a common quantitative factor can be derived in determining how occupational work with encapsulated products translates to household exposures from laundering work clothes. Occupational and clothes handling exposure data were converted to 8 hr and 40 hr time-weighted averages; duration and number of clothing articles handled as well as method for assessing non-detectable measurements were also considered. Across 5 published simulation studies, exposures experienced while handling clothing worn during work with different encapsulated products were on average about 1 to 2% of the occupational exposures. The available data associated with handling and laundering clothing worn during work with encapsulated asbestos-containing products indicate that airborne asbestos concentrations are low and estimated to be in range with lifetime cumulative doses associated with ambient exposures.