

An Evaluation of One-Time Professional Dust Removal in Homes with Deteriorated Lead-Based Paint and Lead Dust Hazards

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Abstract

A key challenge in reducing the burden of lead poisoning is to identify cost-effective interventions that minimize lead-based paint hazards. One-time professional cleaning of lead-contaminated dust and debris was conducted in thirty-seven units with deteriorated lead-based paint and dust lead hazards. These study units are a subset of a larger cohort of the nearly 3500 housing units enrolled in the Evaluation of the HUD Lead-Based Paint Hazard Control Grant Program. Dust lead loading measurements were taken prior to cleaning, immediately after cleaning (i.e., clearance), and six-months, one-, two- and three-years post-intervention. The cleaning intervention significantly reduced dust lead loadings on floors, windowsills, and window troughs immediately following the work. However these reductions did not persist at 6 months and one-year post-intervention. Six months and one-year post-intervention dust lead loadings are not significantly different from the pre-intervention loadings on either bare floors or window sills. Although window trough lead loadings declined over 50% from pre-intervention to one-year post-intervention, the loadings rebounded markedly from the geometric mean at clearance of 101g/ft² to 5,500g/ft² at 6 months and 5,790 g/ft² at one-year post-intervention. These results demonstrate that a single professional cleaning of dust and debris without addressing potential sources of lead dust (such as deteriorated lead-based paint) or repeating the cleaning are unlikely to result in significant and sustained reductions in dust lead loadings. More extensive interventions that address deteriorated lead-based paint although more expensive are likely to provide longer term reductions in dust lead loadings. Cleaning strategies, however, may be useful in emergency situations to reduce lead dust hazards when paint repair and other lead hazard control activities cannot be done immediately.

Achieving Dust Lead Clearance Standards after Lead Hazard Control Projects: An Evaluation of the HUD-Recommended Cleaning Procedure and an Abbreviated Alternative

Sherry Dixon, Ellen Tohn, Ron Rupp and Scott Clark, Applied Occupational and Environmental Hygiene, Volume 14; 339-344, 1999

Abstract

The U.S. Department of Housing and Urban Development's (HUD's) Guidelines for the Evaluation and control of Lead-Based Pain Hazards in Housing strongly recommend that after lead hazard control interventions al walls, ceilings, floors, and other horizontal surfaces be cleaned using a three-step process to reduce lead-contaminated dust and debris. The three steps are: an initial vacuuming using a machine equipped with a high-efficiency particulate air (HEPA) filter (HEPA vacuum), wet wash with a lead cleaner, and a final HEPA vacuum. This study evaluated the effectiveness of two cleaning protocols: (1) the HUD-recommended three-step procedure, and (2) an abbreviated two-step cleaning procedure that omits the final HEPA vacuum. Cleaning procedures were evaluated in 27 dwelling units that had undergone significant lead hazard control

interventions likely to produce lead dust. Dust lead samples were collected on floors and in window sills and troughs prior to the lead control hazard intervention, after the wet wash step of the cleaning procedure, and after completion of the second HEPA vacuuming. The results of the study demonstrate that dust lead surface loading on smooth and cleanable surfaces following the three-step and two-step cleaning procedures can achieve 1995 federal guidance dust clearance levels and levels substantially lower. Although the dust lead clearance rates before and after the second HEPA vacuum were the same, the time saved by omitting the second HEPA is small relative to the other elements of the cleaning process.