

A pilot study of children's exposure to CCA-treated wood from playground equipment

S.L. Shalat^a, H.M. Solo-Gabriele^b, L.E. Fleming^{b,*}, B.T. Buckley^a, K. Black^a,
M. Jimenez^a, T. Shibata^b, M. Durbin^b, J. Graygo^b,
W. Stephan^b, G. Van De Bogart^b

^a Environmental and Occupational Health Sciences Institute (EOHSI), University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, and Rutgers, the State University of New Jersey, Piscataway, New Jersey, United States

^b Marine and Freshwater Biomedical Sciences Center, University of Miami, Miami, Florida, United States

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Abstract

Arsenic from chromated copper arsenate (CCA)-treated wood, widely used in playgrounds and other outdoor equipment, can persist as surface residues on wood. This raises concerns about possible health risks associated with children playing on CCA-treated playgrounds.

In a Pilot Study, 11 children (13–71 months) in homes with and without CCA-treated playgrounds were evaluated with post-exposure hand rinses and urine for total arsenic. Samples of wood, soil, and mulch, as well as synthetic wipes, were sampled for total arsenic. In non-CCA-treated playgrounds vs. CCA-treated playgrounds, respectively, wood arsenic was <2.0 mg/kg vs. mean arsenic 2370 mg/kg (range 1440–3270 mg/kg); soil arsenic was <3.0 mg/kg vs. mean arsenic of 19 mg/kg (range 4.0–42 mg/kg); mulch arsenic at one non-CCA-treated playground was 0.4 mg/kg vs. two CCA-treated playgrounds of 0.6 and 69 mg/kg. The arsenic removed using a synthetic wipe at non-CCA-treated playgrounds was <0.5 µg, while mean arsenic from CCA-treated wood was 117 µg (range 1.0–313). The arsenic mass from hand rinses for children who played at non-CCA-treated playgrounds was <0.2 µg, while mean arsenic mass was 0.6 µg (range <0.2–1.9) at CCA-treated playgrounds. Mean urinary total arsenic levels were 13.6 pg/ml (range 7.2–23.1 pg/ml) for all children evaluated, but there was no association between access to CCA-playgrounds and urinary arsenic levels. Arsenic speciation was not performed.

This preliminary Pilot Study of CCA-treated wood playgrounds observed dislodgeable arsenic on 11 children's hands after brief periods of play exposure. Future efforts should increase the number of children and the play exposure periods, and incorporate speciation in order to discriminate between various sources of arsenic.

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Abbreviations: (CCA), Chromated Copper Arsenate; (US EPA), US Environmental Protection Agency; (As), arsenic; (EOHSI), Environmental and Occupational Health Sciences Center; (LOD), Limits of Detection.

* Corresponding author. Department of Epidemiology and Public Health, University of Miami School of Medicine, 1801 NW 9th Ave, Highland Professional Building, Suite 200 (R 669) Miami, FL 33136, United States. Tel.: +1 305 243 5912; fax: +1 305 243 3384.

E-mail address: lfleming@med.miami.edu (L.E. Fleming).

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