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Gypsum wallboard does not keep out carbon monoxide, study shows

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Researchers found that carbon monoxide diffused across single-layer gypsum wallboard of two thicknesses, double-layer wallboard, and painted double-layer wallboard.

"Carbon monoxide (CO) poisoning is a significant U.S. health problem, responsible for approximately 500 accidental deaths annually, and a risk of 18 percent to 35 percent for cognitive brain injury 1 year after poisoning. Most morbidity and mortality from CO poisoning is believed to be preventable through public education and CO alarm use. States have been enacting legislation mandating residential CO alarm installation. However, as of December 2012, 10 of the 25 states with statutes mandating CO alarms exempted homes without fuel-burning appliances or attached garages, believing that without an internal CO source, risk is eliminated. This may not be true if CO diffuses directly through wall-board material," write Neil B. Hampson, M.D., of Virginia Mason Medical Center, Seattle, and colleagues.

As reported in a *JAMA* Research Letter, a Plexiglas chamber divided by various configurations of gypsum wallboard was used to determine whether CO diffuses across drywall. Wallboard of various thickness levels were tested. Carbon monoxide test gas was infused into the chamber and then CO concentrations were measured once per minute in each chamber for 24 hours. The authors sought to determine how rapidly a concentration of CO toxic to humans would be reached in the noninfused chamber and whether diffusion would then continue.

The researchers found that carbon monoxide diffused across single-layer gypsum wallboard of 2 thicknesses, double-layer wallboard, and painted double-layer wallboard. "Gypsum's permeability to CO is due to its porosity. … The ability of CO to diffuse across gypsum wallboard may explain at least some instances of CO poisoning in contiguous residences. Exempting residences without internal CO sources from the legislation mandating CO alarms may put people in multifamily dwellings at risk for unintentional CO poisoning."

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