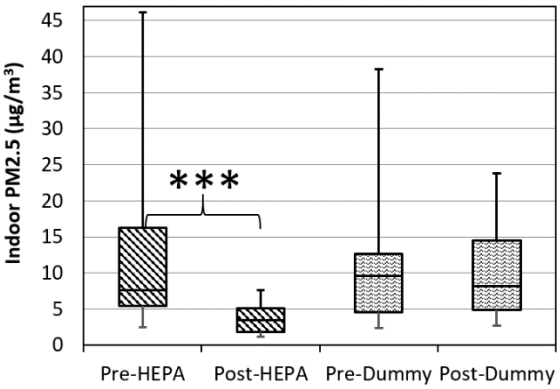
LAY ABSTRACT – TIINA REPONEN

HEPA filtration improves indoor air quality and asthma control in children exposed to traffic-related airborne particles

Traffic is a major source of airborne particles in urban environments. Traffic-related particles can efficiently penetrate from outdoors to indoors and negatively affect indoor air quality in homes close to highways. Exposure to these particles has been associated with increased asthma among children. This study aimed to assess if a portable air purifier equipped with high-efficiency particulate air (HEPA) filter can reduce the indoor concentrations of traffic-related particles. The resultant effect on the respiratory health of children with asthma was also studied. Each participant had both a HEPA air cleaner and a placebo "dummy" air cleaner placed in their home at separate one-month periods. The dummy air cleaner was otherwise similar to the HEPA air cleaner, except that the HEPA filter was removed. Study assessments included air sampling of particles and questionnaires for asthma control and asthma quality of life. These assessments were completed before and after both the HEPA and dummy months. We found that the indoor concentrations of traffic-related particles were significantly reduced with the HEPA air cleaner but not with the dummy air cleaner. This decrease in exposure coincided with improved asthma control and quality of life. The benefit of the HEPA air cleaner was most clearly seen in participants who had poorly controlled asthma and lower quality of life in the beginning of the study. In conclusion, HEPA filtration is associated with improved clinical outcomes and quality of life in children with uncontrolled asthma.



To view the full peer-reviewed article visit: https://doi.org/10.1111/ina.12625. Tiina Reponen is a Professor at the University of Cincinnati College of Medicine Dept. of Environmental and Public Health Sciences mailto:reponeta@ucmail.uc.edu