

What environmental modifications improve pediatric asthma?

EVIDENCE-BASED ANSWER Reducing environmental tobacco smoke exposure decreases health care utilization among poor asthmatic children. Dust mite reduction by chemical measures is potentially harmful. (Grade of recommendations: B, based on single randomized controlled trial.) Evidence is insufficient for or against dust mite reduction by physical means, use of synthetic or feather bedding, removal of cats, use of air filters or reducing indoor humidity. (Grade of recommendations: D, inconsistent studies.)

EVIDENCE SUMMARY Although several studies have shown the benefit of placing asthmatic and allergic children in highly sanitized hospital and sanitarium environments,¹ benefit has been extremely difficult to prove with measures used in the child's home. Only reducing tobacco smoke exposure has been shown to be beneficial. In a randomized trial of predominantly poor minority subjects, fewer acute asthma medical visits were needed by children whose household members underwent behavioral education aimed at decreasing smoke exposure.²

Other methods of modifying the environment have not proved beneficial. Although a group of researchers found that home visits by care providers may decrease acute medical visits, specific allergy avoidance steps did not make a difference.³ Two of these authors also reported that the use of chemicals for house dust mite control and the use of synthetic pillows in lieu of feather pillows may actually exacerbate asthma.⁴ A Cochrane review was inconclusive on the risks or benefits of feather bedding.⁵ Benefit from removing cats is difficult to prove because of the ubiquitous nature of cat antigen and the difficulty in eradicating it from the home. Using air filters and reducing indoor humidity have likewise failed to show meaningful improvement in peak flow, medication use, or symptom scores.

The effectiveness of physical methods to reduce house dust mites is unclear. The Cochrane Review of 15 trials noted a small, statistically significant improvement in asthma symptom scores, but the results were not clinically important enough to rec-

TABLE

Environmental modifications for children with asthma

Intervention	Effect
Tobacco smoke exposure reduction	Beneficial
Chemical reduction of dust mites	Harmful
Physical reduction of dust mites	Unknown
Bedding material (feather vs synthetic)	Unknown
Removal of cats	Unknown
Air filters or dehumidification	Unknown

ommend such measures.⁶ The potential harm of chemical measures was reiterated in this review.

RECOMMENDATIONS FROM OTHERS The National Heart, Lung, and Blood Institute continues to recommend physical barriers to reduce house dust mite antigen based on 4 small trials in which the major benefit was decreased bronchial hyperresponsiveness.⁷ Larger trials, now under way, may help resolve the issue.

*Timothy Dudley, MD
Department of Family Medicine
University of Colorado*

*Joan Nashelsky, MLS
W.A. Foote Hospital
Jackson, Michigan*

Clinical Commentary by Nicholas J. Solomos, MD, at <http://www.fpin.org>.

REFERENCES

1. Simon HU, Grotzer M, Nikolaizik WH, et al. *Pediatr Pulmonol* 1994; 17:304-11.
2. Wilson SR, Yamada EG, Sudhakar R, et al. *Chest* 2001; 120:1709-22.
3. Carter MC, Perzanowski MS, Raymond A, et al. *J Allergy Clin Immunol* 2001; 108:732-7.
4. Platts-Mills TA, Vaughan JW, Carter MC, et al. *J Allergy Clin Immunol* 2000; 106:787-804.
5. Campbell F, Jones K, Gibson P. In: *The Cochrane Library*, Issue 1, 2002. Oxford, England: Update Software.
6. Gotzsche P, Johansen H, Burr M, et al. In: *The Cochrane Library*, Issue 1, 2002. Oxford, England: Update Software.
7. National Asthma Education and Prevention Program. Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma. Bethesda, MD: National Institutes of Health, National Heart, Lung, and Blood Institute; 1997. NIH publication 97-4051.