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Allergists' attitudes toward environmental control:

Insights into its current application in clinical practice

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To the Editor

The prevalence of allergic disease has increased over the past few decades, especially in industrialized countries, where modern lifestyle and socioeconomic status are risk factors for atopic sensitization and disease.¹ The National Asthma Education and Prevention Program 2007 guidelines for the diagnosis and management of asthma recommends controlling allergen and irritant triggers contributing to asthma severity.² However, the overall efficacy (defined as whether an intervention can work under ideal conditions [ie, a clinical study trial]) and practicality of environmental control (EC) have been questioned because of conflicting clinical trials.^{3,4} For example, a study of allergen-impermeable mattress covers involving 1122 adult asthmatic subjects failed to show significant differences between intervention and control populations, whereas a study testing the efficacy of mattress and pillow covers in 60 dust mite—sensitized children showed significant health benefits.⁴ Single-intervention studies might be less efficacious because most patients are sensitized to more than one allergen.⁴ This contention is supported by multiple-intervention EC studies in urban asthmatic children demonstrating positive outcomes.^{3,5,6} Despite overwhelming evidence that directed EC measures can reduce symptoms associated with allergic rhinitis (AR) and asthma, it remains difficult to modify patient attitudes regarding the benefits of this adjunctive treatment. Recently, a survey was distributed to American Academy of Asthma, Allergy & Immunology (AAAAI) members to obtain a clearer understanding of physician attitudes toward EC measures. A complete manuscript can be accessed at www.jaci.org.

The Web-based questionnaire was distributed to 1670 AAAAI members from October 27, 2004, to November 10, 2004, yielding a 28% response rate. One limitation of this survey and surveys in general is nonresponse bias. However, the information obtained from this survey

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might be a stimulus to generate greater interest among allergists in educating patients about the importance of EC. Sixty percent of survey respondents believed that EC was of similar importance to medications and immunotherapy for treatment of AR and asthma but only played a moderate role in atopic dermatitis. Seventy-five percent of allergists emphasized the importance of EC to patients each office visit, and two thirds provided EC educational material each visit. Only 25% counseled patients on avoiding second-hand smoke. Most allergists (85%) provided EC product catalogues to patients and discussed avoidance measures in the context of allergy testing and environmental history. Table I⁷ summarizes EC recommendations made by allergists to patients for the most common indoor perennial allergens.

Among survey respondents, most believed patients had difficulty complying with recommended avoidance measures (Table II); 72% were somewhat satisfied with patient compliance, whereas 17% were completely unsatisfied. After education, the majority of respondents believed patients implemented at least some EC measures, and rarely were they completely noncompliant. Nonetheless, 82% believed only a few patients implemented all EC recommendations. These findings correlate with a 2003 US Environmental Protection Agency telephone survey designed to determine patient knowledge and compliance with EC recommendations, which found less than 30% of adult asthmatic patients or caregivers of asthmatic children implemented some and 7% complied with all essential EC measures. Individuals who had their triggers characterized by a health care provider and received an asthma management plan were more likely to implement EC measures.⁸

EC is not perceived to be cost-effective because beneficial effects are not immediately noticed. Successful multiple-intervention inner-city studies estimated EC costs ranged from \$492 to \$2000 per child.^{3,6} Because EC measures have a lasting effect if properly maintained, reductions in direct and indirect health care costs can significantly offset the initial investment for this intervention.

For EC to be effective (defined as whether an intervention works in routine clinical care situations), patients must understand which interventions are relevant to their needs and the importance of adherence. The majority of recent inner-city clinical trials used trained field health workers to assist in educating subjects. Indoor allergen dust analysis in conjunction with information regarding the child's atopic status was used to develop personalized plans for EC.^{3,5,6} Fieldworkers made multiple visits to the subject's homes to demonstrate proper EC and reinforced compliance by frequent telephone calls.^{3,5,6} One study in France found using a medical indoor environment counselor (MIEC) was more efficient in reducing indoor allergens in homes of patients with asthma and AR than physician recommendations alone.⁹

Thirty-two percent (149/461) of respondents provided recommendations regarding various aspects of EC discussed in the full manuscript online. Recommendations directed to the AAAAI included providing more EC information online in the form of research updates, continuing medical education programs, a patient educational Web page, handouts in addition to more plenary sessions at annual meetings, and development of a practice parameter on indoor allergen exposure and remediation.

These survey findings are consistent with the previous AAAAI position statement on allergen avoidance in allergic asthma.⁷ Effective public health programs to prevent the progression of allergic asthma and rhinitis should consider using trained fieldworkers, such as MIECs, to visit homes of high-risk patients with allergic asthma and assist in proper EC implementation. Counseling patients on EC practices takes time and expertise that should be the primary responsibility of the allergy specialist because studies indicate this element of care improves clinical outcomes and is cost-effective. Whether patient non-compliance is specific for EC or

reflective of patient overall non-compliance (eg, medication use and office visits) requires further investigation.

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TABLE I
Percentage of respondents recommending specific measures from guidelines for the control of indoor allergen exposure⁷

Dust mite allergen intervention (%)	Animal allergen Intervention (%)	Cockroach allergen intervention (%)	Mold allergen intervention (%)				
Bedding encasements	97	Remove pet from house	77	Exterminate with pesticides	65	Reduction of spore infiltration by closing doors, windows and using air-conditioning.	0.5
Wash bedding weekly in hot water	91	Restrict pet to one area	0	Wet washing home/vacuuming	65	Control of moisture, by repairing leaks, etc	96
Vacuum weekly with good-quality bags in vacuum cleaner	63	Remove pet from bedroom	92	Place trash outside the home nightly or daily	0.5	Clean by applying fungicides, remove contaminated material	43
Reduce indoor relative humidity	71	Air filtration	61	Wash dishes daily	0	Use of high-efficiency air filters	39
Replace carpet, upholstered furniture, and draperies	68	Carpet and other reservoirs removal	1.25	Store food in sealed containers	78	Proper maintenance of the heating, ventilation and air-conditioning system	0.75
Avoid living in basements	0	Mattress and pillow cover	28	Seal cracks and other portals of entry	37	Use of personal protection equipment	0
		Use of tannic acid	0.25	Remove source of standing water	32		
		Wash pet	63				

TABLE II

Respondents' perception of patient compliance with EC recommendations

Patients complying with EC	Few	Respondents(%)####		
		Some	Many	Most
Patients implementing at least 1 EC intervention before the initial visit	71	15	10	4
Patients implementing no EC intervention after the initial visit	60	21	14	5
Patients implementing some EC interventions after the initial visit	18	38	34	11
Patients implementing many to most EC interventions after the initial visit	82	12	6	0