

Position paper

Role of the allergist/immunologist as a subspecialist

Committee on the Role of the Allergist/Immunologist as a Subspecialist:

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With the approach of the twenty-first century, the health care delivery system in the United States is in the midst of turbulent evolution. Even though it is impossible to predict with precision what model of health care delivery will predominate in future years, the purpose of this position paper is to preserve and to continue to promote high-quality outcome and value-driven care for the 35 million Americans with allergic and immunologic diseases. We wish to foster assurance of patient access to care and its oversight by allergy/immunology subspecialists, as well as by ensuring the availability of their expertise for the future. This position paper seeks to define the roles of the allergist/immunologist as a subspecialist.

The explosion of biomedical discovery in the latter half of the Twentieth Century has emphasized the benefit of technology and expertise of the specialist as a vehicle for improved care over that of the generalist in the delivery of specialized health service. Now, however, under various forms of managed care and integrated provider networks, the control of health care delivery has been redirected from the specialist to the generalist. In most managed care organizations, the "primary care provider" is responsible not only for preventive care and initial management of illness but also for initiation of subspecialty consultation and direction of subsequent care with or without additional subspecialist involvement.

Because many illnesses involve chronic disease processes, the American Medical Association has recognized a category of patient care as "principal care,"¹ defined as ongoing, preventive, diagnostic, curative, counseling, or rehabilitative care provided by a physician, which is focused on a specific organ disease or disease condition. Principal care may be provided concurrently with or apart from primary care. The American Board of Internal Medicine also has recently advocated the use of the principal care model for those patients with complex and/or chronic disease for whom the

Abbreviation used

ABAI: American Board of Allergy and Immunology

subspecialist appropriately provides most of the patient's care.² As the principal care provider, the subspecialist is expected to assume responsibility not only for subspecialty care but also for coordinating other medical services, as well as for providing communication to patients and their families. For example, the allergy/immunology subspecialist could function as the principal care provider for those patients with moderate to severe persistent asthma, chronic sinusitis, urticaria, immune deficiency diseases, and other immunologically mediated illnesses.

The certified subspecialist in allergy, asthma, and immunology is a physician who has fulfilled the requirements of and has been certified by the American Board of Internal Medicine and/or the American Board of Pediatrics, followed by an additional training period and certification by the American Board of Allergy and Immunology (ABAI), a conjoint board of the parent boards. Therefore by training, allergy/immunology subspecialist diplomates of the ABAI are also certified primary care providers.

According to the policy statement of the ABAI, the allergy/immunology subspecialist has detailed knowledge of the underlying pathophysiology and the methods of diagnosis, treatment, and prevention of allergic and immunologic diseases such as rhinitis, asthma, sinusitis, urticaria, angioedema, anaphylaxis, hypersensitivity pneumonitis, atopic and contact dermatitis, and allergic gastrointestinal disorders, as well as comparable clinical problems without an apparent allergic cause such as vasomotor rhinitis, otitis, nonallergic asthma, and idiopathic and/or hereditary forms of urticaria and/or angioedema. Expertise in the management of pulmonary complications of these diseases is a further prerequisite.³

In addition, ABAI-certified allergy/immunology subspecialists possess breadth and depth in the understanding of immunochemistry, immunobiology, and applied pharmacology plus experience in the application of this understanding to the diagnosis, management, and prevention of immunologic diseases such as primary or acquired defects of host resistance, primary or acquired immune deficiency diseases, bone marrow and solid

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organ transplantation, gene replacement therapy, adverse drug reactions, and other conditions associated with an abnormality of the immune system.³ Because allergy and clinical immunology is an evolving and expanding area of medicine, allergy/immunology subspecialists will vary in their individual expertise.

Subspecialists in allergy and immunology are needed not only as consultants and principal providers of patient care but also as knowledgeable and dedicated investigators who will contribute to advancing medical discovery and understanding of mechanisms of disease processes, as well as the clinical impact of this discovery and understanding. These subspecialty investigators may concentrate their research efforts either as clinical investigators, generating new data and translating new scientific evidence into clinical practice, or as basic scientists, discovering new concepts that improve the understanding of disease mechanisms.

It is imperative that the training programs for future subspecialty investigators in allergy and immunology be preserved, promoted, and protected so that there can be continued education and discovery leading to improved patient care, despite the economic constraints of the changing health care systems. As is currently the case in many training programs, these subspecialty investigators can also function as providers of clinical consultations and principal care. It is essential that future educators and scholars in allergy, asthma, and immunology develop from these career pathways.

Physician workforce assessments have not docu-

mented an excess of allergy/immunology subspecialists in contrast to many other medical subspecialists.⁴⁻⁶ Nevertheless, training programs in allergy and immunology are currently suffering and will continue to suffer from the present trend and determination of some to indiscriminately downsize subspecialty medicine. In order to continue to advance the discipline of this subspecialty, it is essential to continue to train adequate numbers of allergy/immunology subspecialists to prevent future shortages of clinician consultants, subspecialty principal care providers, clinical investigators, and basic scientists in the specialty of allergy and immunology.

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Indoor allergens: Thrill of victory or agony of defeat?

There should be no doubt as to the importance of indoor allergens in the pathogenesis of asthma, allergic rhinitis, and atopic dermatitis. They cause both acute and chronic symptoms and in some instances may even underlie the development of asthma. These facts lead to the obvious conclusion that allergen avoidance should be central to the care of patients who are sensitized to dust mite, cat, or other indoor allergens. In addition, they suggest that avoidance measures should also be used in a prophylactic fashion in patients thought to be predisposed to the development of atopy.

Unfortunately, the approach to allergen avoidance is rarely straightforward. Confusion exists as to the role of many environmental control techniques either because of conflicting study results, a complete absence of study results, or exaggerated claims from manufacturers. A multitude of products is in fact available to the general public, many of which have never been carefully evaluated with regard to their safety or efficacy. Further, these products are most often used without medical supervision.

This issue of *The Journal* includes three new studies on allergen avoidance. The first is a clinical trial of mite avoidance,¹ and the latter two examine methods that might help to reduce environmental cat allergen.^{2,3} The difference in focus between the mite and cat studies largely reflects disparities in our level of knowledge about the different indoor allergens. With dust mite, there is a reasonable consensus as to the measures that are effective in reducing allergen exposure, and most studies now focus on the clinical effects of these measures. With cat, there is little consensus as to the efficacy of anything short of cat removal; and most studies, such as the two here, are still trying to answer the question of whether allergen can be reduced if the cat is not removed, without any analysis of clinical effect. The state of knowledge regarding the control of other indoor allergens, such as molds and cockroach, lags even further behind.

The study by Cloosterman et al.¹ examines the effect of mite avoidance on peak flow rates and asthma symptoms in mite-sensitive, nonasthmatic adults. Re-

markably, significant differences in peak flow rate and a variety of symptom scores were detected between the active and placebo groups. These differences occurred primarily in the second half of this 6-week trial. The authors propose that mite avoidance might serve to delay the onset of asthma in some allergic subjects. This concept has been studied in children⁴ but not in adults, and although this single-blind, short-term study is not the final answer, this is an important concept that deserves further study.

Prior studies have demonstrated reductions in asthma symptoms, medication use, and bronchial hyperreactivity in mite-sensitive patients with asthma, leaving little doubt as to the potential benefit of mite avoidance.⁵⁻⁷ There is still considerable confusion, however, regarding which specific environmental control measures are needed to reduce mite exposure sufficiently to produce a clinical effect. Most studies have used a combination of control measures, which makes it difficult to ascertain which measures were responsible for the beneficial effect. In the study by Cloosterman et al.,¹ a combination of an acaricide (Acarosan) applied to living room and bedroom floors and impermeable covers for mattresses, pillows, and duvets was used. Allergen levels were unfortunately not measured in this study, which is probably an indication of the authors' confidence in these methods. Is this confidence justified?

It is very clear that impermeable covers for mattresses and pillows are invaluable for the control of mite exposure.⁶ Likewise, hot washing of all bed linens on a weekly basis and removal of other fabric items, including carpets, undoubtedly help to reduce mite levels. However, the data regarding acaricides and tannic acid are less clear. Although some studies have shown significant reductions in allergen levels with acaricides,⁸ others have failed to do so.⁹ Tannic acid produces initial reductions in mite allergen levels, but the benefits are typically short-lived.¹⁰ Although these measures should therefore be considered for use in homes where carpets cannot be removed, they probably need to be applied much more often than originally thought, and even with frequent use, will never be a substitute for carpet removal.

Two contributions on the control of cat allergen also appear in this issue.^{2,3} Both are extremely practical studies of methods that might help to reduce allergen shedding from cats. To date, there are no convincing studies on the clinical benefit of environmental control measures for cat allergen. Although it is assumed that cat removal will lead to clinical improvement in cat-sensitive patients who have disease related to their pet cat, even this has not been proven. As to methods that might be used in lieu of cat removal, few data exist as to

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their ability to reduce allergen exposure, much less disease activity. These two studies help to clarify the possible value of cat washing and the use of a commercially available product designed to help reduce allergen shedding. Both methods have generated considerable controversy in the recent past because of conflicting study results.

Although cat washing has long been thought to help reduce allergen shedding, this topic was not studied until 1983 when Ohman et al.¹¹ showed that cat washing yielded considerable allergen in the wash fluid. They did not, however, measure environmental cat allergen or suggest that washing would produce any clinical benefit. Then in 1991 De Blay et al.¹² published a study showing dramatic reductions in airborne Fel d 1 after weekly cat washing. It is of note that this conclusion was made after a total of four washes of one cat with just 1 L of water per wash. Very different results were then reported in a study by Klucka et al.¹³ who found no hint of a reduction in airborne Fel d 1 after washing six cats weekly in 2 L of water for 8 weeks.

In their study, Avner et al.² present data on a total of eight cats washed by three different techniques. For each method, airborne Fel d 1 was measured immediately before and 3 hours after washing. In the first wash method, three cats were bathed weekly for 5 weeks with soap and warm water at a veterinarian's office, which resulted in a modest decrease in airborne allergen of 44%. In the second method, three cats were washed by immersion for 3 minutes in up to 30 L of warm water weekly for 4 weeks, which resulted in a mean reduction in airborne allergen of 79%. In the third method, two cats were washed by the same immersion method and then also rinsed for an additional 3 minutes in 30 L of warm water, resulting in a mean 84% reduction. However, no method produced a sustained reduction in airborne Fel d 1, with levels returning to baseline 1 week after the wash in all but one animal.

In addition, the authors present extensive data on the amount of allergen that is carried on cats, where the allergen is most concentrated, and how much allergen is actually removed by washing. The concentration of allergen in cat hair ranged from 1 µg/gm to more than 1770 µg/gm, with the highest concentration being present on hair from the neck. The total quantity of Fel d 1 per cat was estimated by shaving six cats and was found to range from 3 to 142 mg with a mean of 67 mg. These data support prior studies on cat-to-cat variability in allergen production but differ in that these estimates of total allergen are far higher than those previously reported.¹⁴ Finally, Avner et al.² estimate that the quantity of Fel d 1 removed by washing ranged from 1 to 35 mg, with the highest levels not surprisingly being removed from the cats with the highest allergen concentrations in their fur.

One must ask why these results are so different from those of prior studies. The reductions in airborne allergen are lower than those reported from the same laboratory in the article by De Blay et al.¹² but much greater than those reported in the study by Klucka et al.¹³ The differences

from the first study are most likely due to the larger sample size. If anything, the far greater volume of water used in the washes should have produced better results. With regard to the study by Klucka et al.,¹³ the differences may be due to the greater volume of water used in the washes or to different sampling techniques. However, it is also possible that the results of the two studies are not as different as they appear. In the study by Klucka et al. air samples were collected 1 day before and 2 days after the washes, as opposed to 1 hour before and 3 hours after washes in the study by Avner et al.² Therefore there could have been a short-term reduction in allergen in the study by Klucka et al.,¹³ which was simply missed by the lack of a more immediate postwashing sample. Similarly, we know that allergen levels in this study had returned to baseline within 1 week but cannot discern the rate at which levels rose after washing. Both studies are therefore in agreement that there is no sustained effect of cat washing on airborne Fel d 1 levels.

The final study examines the effect of Allerpet-C (Allerpet Inc., New York, N.Y.) on cat allergen. This commercially available spray is claimed by the manufacturer to reduce allergen shedding. It is composed of deionized, ultraviolet-sterilized water, quaternium 22,26, hydrolyzed animal protein, allantoin, aloe vera gel, imidazolidinyl urea, and collagen. It is typically applied to a cloth that is then used to wipe the cat. Two prior studies of this product have yielded conflicting results. Klucka et al.¹³ found no reduction in airborne Fel d 1 levels in a group of six cats treated with Allerpet-C weekly for 8 weeks, whereas Koren et al.¹⁵ reported in an abstract that cat allergen in settled dust was reduced by the use of Allerpet-C.

In the study by Perzanowski et al., the effects of Allerpet-C on airborne allergen levels were studied in six cats. Three cats were studied before and after a single application, and the three others were treated weekly for 3 to 4 weeks. Allerpet-C was applied by wetting a soft cloth with 50 ml of the solution, wiping the cat for 3 minutes, and then wiping for 2 additional minutes with a dry cloth. Airborne Fel d 1 levels, which were measured before and 3 hours after the Allerpet-C treatment, revealed a mean reduction of 62% after the first treatment. However, in the group receiving weekly treatments, these reductions were not consistent, with levels being equally likely to be higher or lower 3 hours after the treatment.

The authors also measured the amount of Fel d 1 that was removed by Allerpet-C and compared these results with those obtained by simply wiping cats with a dry cloth or a cloth dampened with water. A total of 10 cats was studied. Wiping with a wet cloth, which removed a mean of 1.76 mg of Fel d 1 per cat, was significantly more effective than wiping with a dry cloth, although there were otherwise no significant differences among the three methods. In comparison with the results of cat washing, wiping appears to be considerably less effective. It therefore seems reasonable to conclude that Allerpet-C has nothing more to offer than plain water and that neither method is as effective as cat washing.

It is highly unlikely that the short-term reductions in airborne cat allergen provided by washing or wiping one's pet would be of much benefit to cat owners who are allergic to cats, especially those with a high degree of sensitivity. The more important question, however, is whether any combination of environmental control measures can reduce allergen sufficiently to alleviate disease. De Blay et al.¹² demonstrated significant reductions in airborne Fel d 1 with a combination of cat washing, air filtration, vacuum cleaning, and removal of furnishings, although these results were based on a limited sample size and did not include any measure of clinical effect. Three recent studies, thus far only reported in abstract form, have evaluated different combinations of control measures; and although all have shown significant reductions in allergen levels, two of the three failed to show any clinical effect.¹⁶⁻¹⁸ It is unlikely that anything short of extensive environmental control including frequent cat washes, carpet removal, and air filtration could produce reliable clinical results, and for some (perhaps most) patients even those aggressive measures will not prove sufficient. Because most patients are reluctant to remove pets from their homes, it is critical that these studies be accomplished. At the same time, however, it is at least as important that we continue to take a firm stand on the issue of cat removal when it would clearly be in a patient's best interest.

Thus although we now have one further demonstration of the power of dust mite avoidance, progress in the control of other indoor allergens remains slow, with a dire need for further study.

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