Practical advice to enhance understanding – and compliance

Of mites and dander: Answering patients' allergy questions

ABSTRACT: A key component of successful asthma management is for patients to remove as many allergens and irritants as possible from their homes. The healthiest choice for animal-allergic patients is to completely avoid warm-blooded animals. High humidity promotes mold and dust mite growth, while low humidity can trigger an asthma attack, so recommend a level of 35% to 40%. Carpet cleaning and treatment is most cost-effective if focused on the bedroom and TV room; removing the bedroom carpet seems more extreme than it is. Stuffed animals should be limited to two or three favorites and periodically washed or put in the freezer. Duct cleaning and special furnace filters may be effective in certain circumstances; water vacuum cleaners are probably not indicated. (*J Respir Dis* 1995;16(6):547-551)

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The good news is that during the past decade or so, our understanding of asthma and allergic responses has increased markedly. Along with that, more and better anti-inflammatory agents and bronchodilators have become available.

The bad news is that the incidence of asthma has increased by about 50% during this same period, with a corresponding increase in morbidity and mortality. There have even been asthma "epidemics" in some cities. Adding to our distress about these trends is that they occurred while we spent more than $6 billion annually on asthma. Emergency and other unplanned care accounted for about half of those expenditures, suggesting that better patient education and greater efforts to promote compliance would be highly worthwhile.

In the March 1995 issue of *The Journal of Respiratory Diseases*, I reviewed the key role of controlling household allergens and irritants in managing asthma. Common controllable allergens and irritants include house dust mites, cockroaches, animal dander, mold, and environmental tobacco smoke.

Of course, we cannot assume that just because we ask patients to make simple environmental changes in their homes that they will do them. We cannot assume that we agree on what is "simple." Frequently, they have questions about what we are recommending—some so basic they may be afraid to ask them. Here are questions patients often ask and how I field them.

What exactly are dander and dust mites, and why are they a problem if you have asthma?

Dander is minute scales that fall from the hair, feathers, and skin of

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all warm-blooded animals. Animal dander carries antigens that can cause allergic reactions in sensitive people. House dust mites are microscopic animals that are related to spiders. The fecal material from dust mites is partially composed of substances to which some people are allergic.

Constant exposure to these allergens may result in a state of chronic inflammation that may put you at greater risk for acute asthma exacerbations.

Is the dander of dogs and cats equally bad? What about "nonallergenic" breeds?

Cats tend to be more allergenic than dogs for most allergic people, although some people are more sensitive to dogs than to cats. Contrary to what you may have heard, there are no nonallergenic breeds of dogs or cats.

Animals tend to shed dander at different rates, and hair length is only a minor factor in the skin protein dander reservoir. Hairless cats and nonshedding dogs have significant amounts of dander and are potentially allergenic. Animals tend to go through dander-shedding cycles; at some times during the year they are more allergenic than at others.

The healthiest choice for animal-allergic people is to completely avoid warm-blooded animals. Purchasing a so-called nonallergenic breed usually does not work out well for either you or the pet. Getting rid of a pet after emotional attachments have been formed is hard for the family, you, and the animal.

Can I be allergic to human dander as well as animal dander?

There is no evidence that one human can be allergic to another's dander. However, animal dander is very "sticky" and will cling to the clothing with which it comes into direct contact.

It is common for allergic people to become symptomatic when they are near someone who owns several cats. This can be mistakenly interpreted as being allergic to the person. If there is someone around whom you often become symptomatic, ask if he or she has or lives with cats, dogs, or other warm-blooded animals.

What level of humidity is best?

High humidity promotes mold and dust mite growth. Humidity levels less than 50%, and particularly less than 40%, inhibit mold and dust mite proliferation. However, very low humidities (less than 25%) are somewhat irritating, particularly in climates where cold weather also causes nasal irritation. Wintertime nosebleeds are common in cold, dry climates.

Cold or dry air can also trigger an asthma attack. Therefore, a humidity level between 35% and 40% is an acceptable compromise. To measure the relative humidity in your home, you can purchase an inexpensive analog or digital display hygrometer.

Should I clean the carpeting in rooms other than the bedroom and TV room?

Spend your money and effort where it will do the most good—in the rooms where you spend the most time. For most people, the bedroom tops the list and the TV room takes second place. Generally, other rooms are much less important. Nevertheless, a good carpet cleaning by a professional service, at least once, is likely to be helpful. After the cleaning, be certain that all residual moisture is removed to avoid conditions that promote mite proliferation. However, this is much less important than, and should not be substitute for, regular vacuuming and thoroughly treating the carpeting in the bedroom with benzyl benzoate or tannic acid solution.

What is the best way to deal with the flooring in the bedroom?

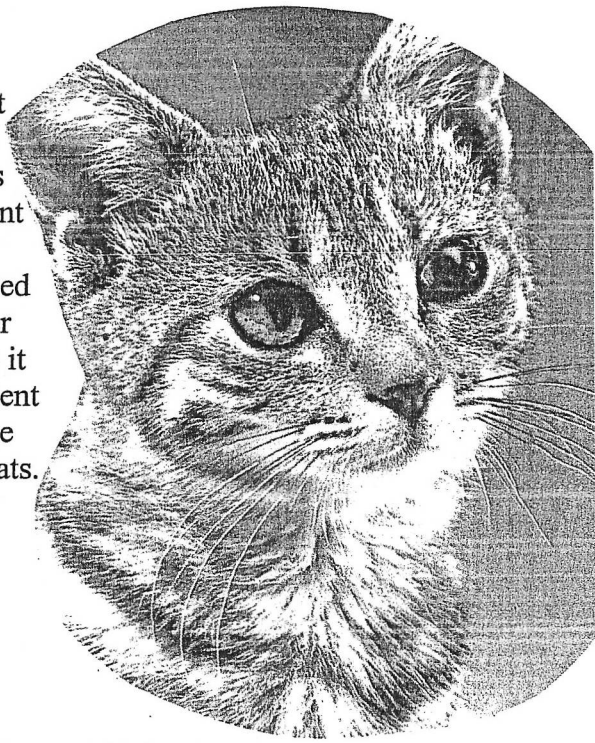
The best floor covering for the bedroom is either tile or wood parquet. A polished floor does not harbor dust mites or animal dander. Removing carpet that is already in place is not as extreme or expensive as one might think and is a most effective means of controlling exposure to dust mite antigen. It has the added advantage of being much less trouble than regularly cleaning and treating a carpet.

If you must have carpet in the bedroom, treat it with a miticide regularly, such as benzyl benzoate (every 3 months) or tannic acid solution (every 2 months). If there is or has been a pet in the home, use tannic acid solution because it may also reduce the amount of animal dander. A word of caution: tannic acid can stain white carpet so you probably should not use it if your carpet is white.

Although benzyl benzoate is not known to be toxic, it would be prudent to keep pets and infants off of treated carpet until after it has been vacuumed. Benzyl benzoate is a powder that you sprinkle on the carpet and brush in with a stiff broom; you then wait at least 4 hours (I recommend waiting 12 hours) before vacuuming. If you use benzyl benzoate to treat the carpet, an annual toxicology screen of infants and young children might be reassuring.

Neither of these agents seems to be dramatically effective for mite antigen control, and both must be used thoroughly and regularly to realize any benefit. Of special in-

PETS



Don't panic! We're not going to ask you to put dear old Rover up for adoption! Nor will we pack kitty off to the pound. What we do ask is that you use you own good sense and judgement about the place of a pet in your home. A high percentage of allergic patients become sensitized to the hair, dander, or saliva of any animal after being around that animal. The amount of time it takes to become sensitized depends on the patient and the animal. In addition, animals carry large amounts of pollen and mold spores on their coats. When pets come inside, so do these allergens. We recommend the following guidelines be followed where pets are concerned:

1) If you don't have pets, do not get any!

2) If you already have a pet, it should live outdoors. If it is allowed inside the house, it should be kept out of your bedroom at all times.

3) One type of pet is generally no better than another. If you are allergic to dogs or cats, you will tend to develop allergies to others.

4) Fur-bearing animals such as cats and dogs should never be carried in a car with you when on a trip! The number of allergens in the air will be greatly increased in such a closed-in environment.

5) Always wash your hands well after you touch an animal.

6) Try to avoid facial contact with animals if at all possible.

terest to California residents—benzyl benzoate has not been approved for use by the California Environmental Protection Agency.

What should we do about our child's stuffed animals?

Inch-for-inch, stuffed animals are among the richest sources of dust mite antigen, and they are frequently next to the child's face. This provides easy access to the respiratory tract!

Limit your child to two or three favorite stuffed toys, which should be laundered with the bed linens each week. Some brands of stuffed toys are specially made to withstand this rigorous treatment. An alternative is to place them in a freezer for 24 to 48 hours every 2 weeks, which markedly reduces the dust mite population without risking damage to the toys. All other stuffed toys should be bagged and put out of sight or given away.

Should I have my furnace ducts cleaned?

Although there is evidence that duct cleaning reduces mold counts, there is no solid evidence that it reduces animal dander. Nevertheless, I recommend duct cleaning (along with washing the walls and treating the carpet) when animal-allergic people move into a house where an animal has previously dwelled. Dust-allergic patients are unlikely to benefit significantly from duct cleaning.

Should I purchase a special furnace filter?

Several studies have indicated that electrostatic or HEPA (high-efficiency particulate air) filters remove dust mite, mold, and animal dander particles; however, their clinical effectiveness has not been determined.

House dust mite particles settle out of ambient air quite rapidly, so they tend to be concentrated in carpeting, bedding, and upholstered furniture. Because these particles do not remain suspended, filters are an ineffective means of removing them. For dust mite particles, it is simpler, less expensive, and more effective to encase the bedding in zippered plastic covers, launder bed linens weekly in 130°F (54.4°C) water, and remove bedroom carpeting.

Conversely, electrostatic or HEPA filters, if they are kept clean, may help reduce exposure to animal dander because it remains suspended for relatively long periods. There is no compelling evidence that HEPA filters effectively remove mold; however, mold-allergic patients may benefit from using one of these filters.

Should I purchase a new water vacuum cleaner?

Absolutely not. The results of studies of animal dander indicate that it efficiently attaches to water droplets from the vacuum cleaner, which then *increases* the dande content in the air. Generally, powerful dry vacuum cleane equipped with double vacuun cleaner bags or a HEPA filter ove the vacuum cleaner's outlet is best

What should I do about my car heater and air conditioner?

Car ventilation systems can have mold overgrowth; when that occurs, mold-sensitive people become symptomatic whenever they turn on the blower. Some late-model cars have HEPA filters built into the heating and cooling systems, which appear to reduce the problem.

Cleaning systems that "sterilize" the heating and air-conditioning vents are available at some automobile dealerships. If you repeatedly become symptomatic while in the car, having the vents sterilized is a reasonable thing to do. Alternatively, if this type of cleaning is not available, you can leave the heater/air conditioner on and the windows open for a few minutes before you enter the car.

SUGGESTED READINGS

- Call RS, Smith TF, Morris E, et al: Risk factors for asthma in inner city children. *J Pediatr* 1992;121:862-866.
- Luskin AT: Environmental control: Key to asthma management. *J Respir Dis* 1995; 16:253-266.
- National Asthma Education Program Expert Panel Report: *Guidelines for the Diagnosis and Management of Asthma*, US Dept of Health and Human Services publication No. 91-3042. Bethesda, Md, 1991.
- National Heart, Lung, and Blood Institute: *International Consensus Report on Diagnosis and Treatment of Asthma*, US Dept of Health and Human Services publication No. 92-3091. Bethesda, Md, 1992.
- Platts-Mills TAE, Tovey ER, Mitchell EB, et al: Reduction of bronchial hyperreactivity during prolonged allergen avoidance. *Lancet* 1982;1:675-678.

MISSION ALLERGY

Pillow and Mattress Encasings

There is much confusion about the different types of allergen-proof pillow and mattress encasings on the market today. There are three basic types of encasing: vinyl, polyurethane laminates, and microfiber.

Vinyl encasings are the oldest type, and the easiest to understand. They are inexpensive, effective…and uncomfortable. These plastic encasings are probably the first thing that come to mind when most people think of an encasing. They are stiff, noisy and sweaty. As a result, many individuals remove them after a day or two. They are suitable, however, as an economical cover for a box spring. On a box spring one is not sleeping on the plastic directly, so comfort is not an issue.

Laminate encasings were the next generation of encasings. These are still widely used, and are the type generally available at places like Bed, Bath and Beyond or Wal-Mart's, as well as from many allergy supply companies. When these were first developed, they represented a great advance over vinyl. They are made by laminating (fusing) a plastic-type membrane—now usually a polyurethane—to a fabric. The membrane side is against the pillow or mattress, and the fabric side is exposed, beneath the bed linens. The person is therefore not sleeping on the plastic directly, and these are therefore more comfortable than vinyl. Laminates have several problems, however, that have made them somewhat out of date.

The first problem with laminates is that, although less rigid than vinyl, they do have some stiffness to them. This is especially noticeable on the pillow. Second, they are not only allergen-proof—they are airtight. Although some laminates have been advertised as being "breathable", this refers only to the fact that in some of the better quality laminates a minute amount of water vapor can pass through the membrane. Although this represents an advance over vinyl, the fact is that no laminate is truly breathable; that is, *none of them allow the passage of air.* Once an encasing of this type is zipped closed around a pillow, the pillow becomes like a balloon, with air trapped in the encasing. And if you force the air out by pressing on the pillow, the air--and probably dust along with it--escapes through the zipper.

The third and perhaps biggest problem with laminate encasings is that they often de-laminate, that is, with repeated washing and drying the urethane membrane separates from the fabric onto which it had been coated, making the encasing unusable.

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Microfiber encasings are the newest type of allergen-barrier encasing. They are constructed from microfiber fabrics: new high-tech fabrics made of fibers so thin and yarns so tightly woven that there is no space between the weave of the yarns large enough to allow the passage of allergen molecules. Since the microfiber fabric is itself acting as a filter that prevents allergen escape, encasings made from a true microfiber do not need the urethane membrane. Without the membrane they are truly breathable, that is, both air and water vapor can pass freely through the fabric, even though allergen cannot. They are therefore extremely comfortable, actually imperceptible in use. This is the state-of-the-art in allergen-proof encasings.

The problem is that not all microfibers are created equal. In fact, most of the so-called microfiber encasings on the market are not true microfibers at all, according to textile industry standards. Microscope photos taken at 40 power magnification reveal that many of the competitive products are much less tightly woven than Mission: Allergy barrier fabric. The areas of light coming through the fabric indicate pores. In many cases these pores are more than large enough to allow the passage of allergens. (Note: An interesting way of demonstrating the extraordinary tightness of Mission: Allergy microfiber barrier fabric is to simply put a few drops of water on it and see what happens.)

Studies done at the University of Virginia have shown that a microfiber fabric must have a pore size of no more than 6 microns to block all allergen. Mission: Allergy barrier fabric has a maximum pore size of about 2 microns. Many encasings on the market have pore sizes of 10 microns or more. Unlike many competitive encasings, Mission: Allergy barrier fabric blocks *all* allergens, not only mite allergens but also the smaller animal dander allergens. This is important when a patient removes a pet from the bedroom, and the encasing must prevent the escape of previously accumulated allergen from the mattress. Yet this super tight fabric is the most comfortable on the market, literally as soft as silk.

And it costs no more than out of date laminate encasings! Prices for Mission: Allergy encasings are essentially equal to what another company charges for their Elite line of laminate encasings, essentially equal to what retail stores charge for generic laminate encasings. Mission: Allergy encasings are the most effective, the most comfortable, and the most fairly priced.

One last type of encasing fabric, the "non-woven", must be mentioned to make the story complete. An older example of a non-woven fabric is felt. This is made by gluing short pieces of yarn to each other to form a mass. This is in contrast to a woven fabric where the long warp and weft yarns are alternately woven above and below each other on a loom. Non-woven fabrics are inexpensive allergen barriers, but they are not strong. You can make a hole in them with your thumb if you push hard. They are inexpensive, but not made to last.

Not all encasings are equal! It is of course up to the individual to decide what they want to buy and what they are willing to spend. But if the above differences are understood, one will be in a position to make an informed decision.