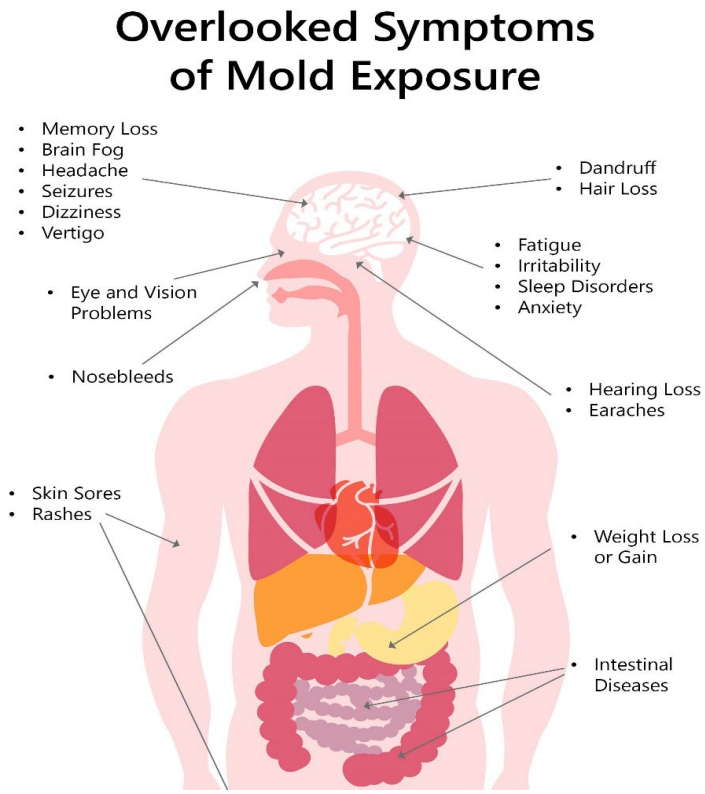
TEST NAME: Mold Elimination Guide

Introduction

You have recently tested positive for a mold allergy or sensitivity. Defining the immune responses to molds through testing for IgE, IgG, and IgA antibodies to various molds can help distinguish the nature of the immune response a patient is having. Elevated IgE indicates an allergic response, IgG confirms exposure, and IgA indicates a strong mucosal response, which may be due to recent respiratory exposure.

Allergic reactions may happen immediately or develop after a period following exposure. Patients exposed to molds may present with classic seasonal allergy symptoms throughout the year. Symptoms and signs of mold allergy may include: sneezing, runny nose, coughing, wheezing, watery eyes, redness of the eyes, itchy eyes, skin irritation, or rash.

Molds are found in virtually every environment, both indoors and outdoors, all around the world. Controlling your environment and avoiding certain foods that contain mold can significantly reduce symptoms such as asthma, stuffiness, respiratory problems, headaches, and depression, to name a few.



Symptoms of mold exposure are often overlooked because symptoms are very similar to viral or bacterial infection symptoms, as well as the flu.

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Introduction

There are over 300,000 different species of fungi yet only 80 genus and/or species are currently recognized as being associated with allergies. Mold and fungi produce spores that are not visible individually. Mold spores give mold colonies their color. Dry mold spores are spread by air but can also be transported by water, insects, animals, and on clothing. Mold spores germinate if they land in a moist environment and start forming a colony within 48 hours. Molds thrive in warm, humid conditions but can also be found in dry, hot places. They may also exist in cooler environments such as refrigerators.

Outdoors, mold can be found in shady damp areas where leaves or other vegetation are decomposing. Spores can be inhaled while engaging in yard work or hiking in the woods. Indoors, molds make their home in basements, bathrooms, refrigerators, indoor plants, air conditioners, dehumidifiers, and furnace filters. Molds like sugar and salt – you may have seen mold on refrigerated jelly or salami.

Fungi can be a serious pest. Fungal growth breaks down the host it is growing on with the enzymes it produces, be it food, wood, or grout in the bathroom. Fungi cause dutch elm disease in trees, tomato blight, athlete's foot and ringworm in humans, and can also trigger asthma.

The Alletess Mold Elimination booklet contains information on:

- Common sources of mold
- Mold removal tips
- Natural fungicides
- Foods that contain mold
- Tips on preventing mold growth on food
- Descriptions of molds tested

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Mold Removal Tips

Sources of Indoor Mold

- Air Conditioners
- Dehumidifiers
- Humidifiers
- Vaporizers
- Attics
- Crawl spaces
- Bathroom tiles
- Showers
- Damp closets
- Potted plants
- Refrigerator linings, gaskets, and trays
- Soiled surfaces
- Old bedding and pillows
- Stored foods (especially cheese, bread, fruit)
- Unfinished or damp basements
- Dishwashers and washing machines

Sources of Outdoor Mold

- Compost heaps
- Hay cutting
- Harvesting
- Damp garages
- Cottages/cabins
- Nature trails
- Grass cuttings
- Raking leaves
- Humid weather
- Gutters and drains
- Standing water

Mold Removal Tips

The best way to eliminate molds is to first identify potential problem areas: damp basements, dry rot, high humidity, houseplants, or unventilated bathrooms. Make any structural changes that might improve the area. For example, you may install gutters, drainage ditches, cement floor, vents with exhaust fans, or a dehumidifier. Check the humidity levels, ideally relative humidity should be less than 50%. Remove plants and carpets. Install an air purification unit in affected rooms or on the entire heating system. Make sure that basements are well ventilated.

As molds never disappear, they require periodic eradication. To remove or slow the growth of mold, you must change the conditions in your home.

Suggested Tips

- Reduce excess humidity in the house. Dry cool air and sun are effective in reducing the growth of mold.
- Clean air vents and exhaust fans in bathrooms regularly. Consider having air ducts in your home cleaned professionally.
- Dustproof covers for the mattress, box springs, and pillows are necessary.
- Remove all obvious moldy items such as shoes, luggage, books, plants, wallpaper, and carpet.
- Check stored foods for the possibility of spoilage and mold growth.
- Check bathroom walls, floor, and shower doors or curtains for mold growth. Dry damp bathroom walls following showers.
- Baking (bicarbonate) soda and water makes an effective cleaner for removing mold depending on your sensitivities. Monthly washing of all surfaces and carpet removal are very effective.
- Check rubber gaskets, seals, drip pans on windows, air conditioners, vaporizers, humidifiers, refrigerators, dishwashers, and washing machines for mold growth. Clean these items regularly.
- Remove houseplants and dried flowers.
- Bleach, vinegar, and quaternary ammonia containing cleaning products are readily available to aid in the removal of mold.
- Change kitchen sponges and dishcloths regularly. Sanitize sponges in microwave, dishwasher, or soak in bleach.
- Vent clothes dryers outside of the house. Check the vent tube or pipe for leaks.
- Avoid leaving damp clothes in washing machines or closets. After using your washing machine, leave the lid/door open to let it dry out.

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Mold Removal Tips

- It is recommended that kitchen range hoods vent outdoors.
- Cross ventilate and heat basement. Consider installing a dehumidifier. Attics and crawl spaces should also be well ventilated. Insulate cold water pipes in the basement and under the sink cabinets so that condensation does not collect.
- Replace your furnace filters with HEPA filters. Besides trapping some mold, it filters out any dirt.
- Consider purchasing a hygrometer, an inexpensive tool that measures humidity.
- Consider installing an air purifier. Make sure that the model you choose can remove particles as small as 5 microns and is adequate for the size of the room you wish to install it in.
- Replace your kitchen trash can with a small one and use a trash bag. Take the trash out daily.
- Use mold resistant paint on the walls, especially in bathrooms.
- Reduce the level of house dust in every room.

Never mix bleach containing products with ammonia containing products and always follow the manufacturer's instructions for use.

Natural Fungicides

Natural Fungicides to Consider

- Tea tree oil (melaleuca oil) can be sprayed in ductwork twice a week or sprayed directly on mold spots. *Note - tea tree oil must not be ingested as it can cause serious side effects.**
- Lemongrass can be used in an atomizer to disinfect a room.*
- Oregano oil can be used in an atomizer. *Do not use if you have a ragweed allergy.**
- Neem oil (azadirachta indica), a vegetable oil pressed from seeds and fruits of the neem evergreen tree can be used as a spray on plants to treat fungal disease and as an insecticide.*
- Rosemary oil can be applied topically. *Should not be ingested.**
- Grapefruit seed extract can be mixed with water and sprayed on affected areas.*

**Note that some essential oils can be harmful to pets. Please speak to your veterinarian before use.*

- Olive leaf extract is a broad-spectrum antimicrobial agent for internal (in pill or capsule form) or topical use.
- Apple cider vinegar can be diluted with water and used to spray indoor plants. Mix 3 tablespoons of apple cider vinegar with 1-gallon water.
- Lemon juice mixed with baking soda to form a paste is a safe, non-toxic cleaner for the refrigerator. Pay attention to the door gaskets, where black mold can lurk.
- Baking soda mixed with mild soap and water can be used to spray plants to protect against black spot or white powdery mildew.
- Vodka can be applied directly to mold spots, let sit for a while, and wipe clean with a disposable rag.

Foods that Contain Mold

The following is a list of foods that naturally contain mold:

- Cheese of all kinds
- Vinegar and foods containing vinegar: mayonnaise, salad dressings, ketchup, chili sauce, pickles, relishes, and mustard
- Tomato products such as sauce and paste
- Pickled fish and smoked meats
- Delicatessen foods: sausage, frankfurters, corned beef, pickled tongue, ham, and bacon
- Sour cream, sour milk, milk, buttermilk, and yogurt
- Soured breads, coffee cakes, and other foods made with large amounts of yeast
- Fermented items such as soy sauce, miso, and tempeh
- All dried fruits such as apricots, dates, prunes, figs, and raisins
- Mushrooms and truffles
- Alcoholic beverages especially beer, wine, and sake
- Cider, root beer, and ginger ale
- Kombucha and pu-erh tea

Tips for Preventing Mold on Food

- Bread is best stored in a bread box.
- Consider freezing bread and taking some out as you need it.
- Fresh produce is best kept the way it was stored when purchased (i.e. refrigerated or room temperature). If you placed the produce in a plastic bag at the grocery store, remove it from the bag when you get home.
- Do not wash your produce until you are ready to use it and only wash the amount you plan to use. Wet produce spoils faster and produces mold.
- Avoid purchasing produce with visible bruises, wetness and/or softness. Mold appears quickly on damaged produce and will spread to others in close vicinity.
- Organic food is most likely to spoil faster.
- Spoiled food should be removed from inside the home immediately. Leaving spoiled food in a kitchen trashcan will allow mold spores to spread in the house. It is better to move trash to an outside container.
- Use spices within 6 months. You should mark the date on your spices the day they are opened.
- Refrigerate chocolate after opening and use within 2 weeks.
- Use loose tea rather than tea bags. Tea bags capture mold spores.
- Use grains within 6 months.
- Keep nuts in the freezer.
- Use leftovers within 3 days or freeze.

Common Molds

Below is a list of the common molds frequently tested. You may not have been tested for all of the molds listed. If you wish to test additional molds, call 800.225.5404.

Alternaria alternata: spores are large, pea or bottle shaped, and golden brown in color. Very common in the air late spring and fall, it is generally considered an outdoor mold. The fungus grows on organic debris in the soil, leaves, stems, flowers, many vegetables, cereal grains, and ornamental plants (such as cabbage and chrysanthemum). *A. alternata* is one of the most common molds affecting children. Significant concentrations have been found in house dust of allergic children, supporting the hypothesis that fungal allergen exposure is an important component in the mechanism of developing asthma. Dry, windy weather spreads *A. alternata* spores. They are found indoors in air conditioner drip pans and in condensation build-up on window frames.

Aspergillus fumigatus: produces small round spores, varying in color from black, yellow, orange, green, and brown. This mold is found in fertile soil, decaying vegetable matter, bird droppings, stored sweet potatoes, flours, tobacco, swimming pool water, wet surfaces in bathrooms, and in drip pans of refrigerators and other appliances. It colonizes in decaying vegetable matter, uncooked fruits, plant leaves, and textiles. There are over 180 species of Aspergillus, but only 40 are problematic. A non-toxic *Aspergillus* strain is used in making vinegar and soy sauce. *A. fumigatus* thrives at degrees 104°F (40°C) and is at peak concentrations in late summer through winter. It is one of the most prevalent airborne fungal pathogens and is considered both a primary and opportunistic pathogen.

Aureobasidium pullulans: colonies have a slimy yeast-like appearance, spores are small and egg-shaped. This fungus is common on wet decaying wood and produces large numbers of spores during the summer months. It also appears in the surface layer of soils and has been found on seeds, barley, oats, tomato, berries, citrus fruits, grapes, and pecans. Indoors it is found in kitchens and bathrooms, which can be damaging to interior painted surfaces. *A. pullulans* can also be found in contaminated air conditioners and humidifiers. The optimum temperature for growth of this fungus is 86°F (30°C).

Candida albicans: is common in soil, organic debris and is seldom airborne. *C. albicans* occurs naturally on the skin and in the gut. It can cause significant infections such as thrush, skin infections in diabetics, and sepsis in those who are immuno-compromised. Over 20 species of *Candida* are pathogenic to humans with *C. albicans* being, by far, the most prevalent.

Chaetomium globosum: a rapidly growing mold, thrives on cellulose-rich substrates found in soil, straw, wood, plant debris, paper, seeds, and bird feathers. New colonies are white turning to

Common Molds

grey and olive color as they mature, sometimes changing to red, brown, or black. It is often found in homes that have suffered water damage.

Cladosporium herbarum: spores are moderately small, round, and olive brown in color. *C. herbarum* dominates indoor and outdoor air. It is a major source of inhalant allergens. It is commonly found on dead woody and herbaceous plants, foodstuffs, rubber, paper, and textiles. In homes and commercial buildings, it appears in HVAC systems, air filters and fans, damp walls, carpets, and mattress dust. *C. herbarum* cross reacts with the latex allergen and other molds.

Epicoccum purpurascens: small black pustules. A secondary decomposer of plants, soil, paper, and textiles. It can also be found in fruits, polluted freshwater, compost beds, insects, human skin and sputum. It is known to cause leaf spots on plants. This mold is one of the more common outdoor allergens. *E. purpurascens* spores are more prevalent on dry windy days. The optimum temperature for growth for this mold is 73-82°F (23-28°C).

Fusarium proliferatum: colonies are typically white or cream with a tinge of purple. This mold is widely distributed on numerous grasses and other plants. It is a common soil fungus. The *Fusarium* genus is a major source of mycotoxins in food and animal feed. It is a major pathogen of rice, sugar cane, sorghum, soybean, maize grains, asparagus, banana roots, and other fruits and vegetables. It sporulates in warm, wet weather. During winter or in dry periods, the fungus survives in the soil or on plant debris.

Mucor racemosus: is dark grey or olive grey in color and grows rapidly. Found primarily in soil, it is also found in plant remains, grains, vegetables, nuts, barns, barnyards, animal material, diseased pineapple, fruit juice, marmalade, and in certain soft cheeses. *M. racemosus* is considered an indoor mold and has been found on dry pet food. There have been no studies linking cross reactivity with this mold.

Penicillium chrysogenum: produces small round spores that are usually smooth and colorless or pale blue or green. Colonies of this fungus may be seen on food and other organic materials such as: citrus fruits, jams, bread, apples, nuts, stuffed rubber mattresses, fabrics, stuffed furniture, leather, and house dust. It is considered a major source of indoor mold. *P. chrysogenum* is commonly found in wine cellars, vineyards, barns, citrus plantations, and in seed storage areas. Two strains of *Penicilium* are used in making blue and green mold cheese. It is widely found in soils, forests and grasslands in temperate zones. There are over 200 species in the *Penicillium* genus.
NOTE: an allergy or sensitivity to *P. chrysogenum* bears no relationship to an allergy or sensitivity to the antibiotic Penicillin.

Phoma betae: colonies are often pink, purple, or grayish brown on walls and powdery or suede-like. Found in soil, *P. betae* will attack damaged plants and may cause leaf blight. It can be found

Common Molds

on cheeses, fermented meat products, and harvested vegetables. *P. betae* is found indoors on damp or humid surfaces. It is considered an opportunistic pathogen in humans.

Rhizopus nigricans: spores are small, oval, and grayish brown. It is found on damp walls, in basements, children's sand boxes, and on food leftovers. It is also found in nests, feathers and droppings of wild birds. It is closely related to the *Mucor* mold and its spores are dispersed in hot, dry weather. It is commonly known as the "bread" mold. *R. nigricans* is considered an occupational mold as exposure is common among workers in the fresh produce industry.

Setomelanomma rostrata: spores are black or dark brown in color and velvet-like in appearance. Considered seasonal, spores are released in hot, dry weather. *S. rostrate* is found on grasses, cereals, textiles and in soil.

Stemphylium herbarum: spores are fairly large, rounded and dark brown, black, or grey in color. This mold is common in temperate and subtropical regions. It is found in soil, grasslands, polluted freshwater, and on leaves and the bark of trees. As a seedborne fungus, it is seen on barley, wheat, and tomato. *S. herbarum* spores are commonly released when relative humidity decreases, and light is present.

Stachybotrys atra: (S. chartarum) A black mold commonly found in damp and water damaged structures. It thrives on materials with a high cellulose content.

Trichoderma viride: colonies grow rapidly appearing white at first with green patches and yellow or tan on the reverse side. *T. viride* is typically found in soil and on wood. In homes, it is found in damp areas and unglazed ceramics. *T. viride* can cause green mold rot on onions and cultivated mushroom.