

the TOXIC TORT newsletter

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We Make The Complex Simple

Update On The Science Of Mold

By Edward J. McCambridge

The Institute of Medicine, in June 2004, published *DAMP INDOOR SPACES AND HEALTH*. This contains the latest examination of the relationship between mold and human health. The proliferation of mold related litigation merits an examination of the current scientific knowledge concerning mold and disease.

Mold is within the kingdom of organism known as fungi. This group also includes mildews, mushrooms and yeast. It is estimated there are between 50 thousand and 250 thousand species of fungi. Fewer than 200 have been identified as human pathogens that can cause disease.

Mold is ubiquitous and is found both indoors and outdoors. More than a thousand different species of mold have been identified in American homes. All molds reproduce by creating spores. These extremely small and lightweight elements are able to travel through the air, surviving dry and other harsh conditions for long periods of time. However, to grow on a surface they need moisture and food. Their growth is stimulated by warm, damp and humid conditions.

Many building materials provide suitable nutrients that encourage mold growth. Wet siliceous materials such as paper, cardboard, ceiling tiles, wood, wood products, dust, paints, wall paper, insulation materials, drywall, carpet, fabrics and upholstery are all suitable hosts that encourage mold growth.

Mold spores are tiny bacteria less than 4 microns in size. 250 thousand spores can fit on the head of a pin. The spores attach themselves to airborne dust particles and can travel long distances.

The most common indoor molds are *Cladosporium*, *Penicillium*, *Aspergillus* and *Alternaria*. *Stachybotrys chartarum* is less common but not rare.

Stachybotrys chartarum is also known as *stachybotrys ultra* and is greenish/black

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Welcome

Toxic tort litigation presents difficult and interesting new challenges. It is a field that changes at an ever-increasing rate and requires specialized knowledge to manage it effectively. We recognize it is difficult to stay abreast of the latest medical and scientific issues on a national basis. The purpose of this newsletter is to alert you to the new developments and trends in asbestos litigation and other toxic tort matters and to outline strategies and tactical options in managing the litigation. Please provide us with your comments or suggested topics that you might want discussed in future issues. We thank you for reviewing this material for us.

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About The Editors

EDWARD J. MCCAMBRIDGE has substantial trial experience in product liability, automobile, premises and sports liability litigation. He concentrates his current practice on complex tort litigation with special expertise in toxic tort and products liability actions.

Mr. McCambridge was the Chairman and President of the Chicago Asbestos Defense Group and was appointed by the Circuit Court of Cook County as liaison officer and lead counsel for the defense of all asbestos litigation pending in Cook County.

He is a frequent lecturer, having spoken at numerous venues including the Conference of Insurance Legislators, the Chicago Bar Association on asbestos litigation and a featured speaker at a National Business Institute Seminar on "Trial Advocacy," among others. Mr. McCambridge is the 1991 and 1999 author of "Trial Advocacy in Illinois," and gives lectures on the article. He has also authored a chapter on handling toxic tort cases in the Illinois Association of Defense Trial Counsel Manual.

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He has developed special expertise in epidemiology, medical causation, toxicology, industrial hygiene, risk assessment and biostatistics. Mr. Mahoney also has considerable experience defending general product liability, professional liability, construction and insurance coverage matters.

in color. It can grow on material with high cellulous and low nitrogen content. Growth occurs where there is a high moisture content present. Consistent moisture is required for growth of all ten species of *stachybotrys*. It occurs mainly on dead plant material. *Stachybotrys chartarum* is a natural substrate found in straw. Indoors it can be found on cellulous materials including paper, canvas and jute. It has been identified as a toxigenic mold.

Aspergillus can be found world wide, although it is more common in warmer climates. It will grow on a vast array of organic materials. There are 182 accepted species, although only 40 occur with any regularity. Respiratory infections due to the inhalation of *aspergillus* have been documented in immunocompromized individuals. *Flavus* is one of the sub-species of *aspergillus*. It is the main producer of *Aflatoxin*, a potent carcinogen. Another sub-species, *A. Fumigatus* is a recognized cause of the invasive disease *aspergillus*.

Alternaria is a genus comprising of approximately 50 species which are mostly saprophytes or plant pathogens. *Alternaria* is an extremely common saprophyte found on plants, wood, wood pulp, textiles and on food. It has been found worldwide. It has also been shown to produce reactions at very low concentrations in sensitized individuals.

Cladosporium consists of approximately 500 species, although only 20 are commonly found. These also are generally found on wood, plants, wood pulp, textiles and food. *Cladosporium herbarium* produces a wide variety of allergen and approximately 10%

of the population is sensitized to this form of mold.

Penicillium consists of 225 recognized species although only 70 occur with any frequency. *P. Aurantiogriseum*, one of the penicillin species, is considered toxic.

The human body has a superb defense system for preventing reactions caused by mold. The respiratory immune system consists of a variety of elements that work together to prevent a foreign substance from entering the lung or to remove the foreign substance once it has entered. The first line of defense are the nasal passages. The nasal passages are irregular airways lined with nasal hairs that help trap and block the particles before they can enter the bronchial passages.

The bronchial passages carry the air to the alveolar sacs where gas exchange occurs. These passage ways contain cells for the creation of mucus to trap the particles prior to reaching the location of gas exchange. Furthermore, the bronchial passages have mucous-ciliary escalator that helps move foreign substances out of the lung into the trachea where they can be swallowed or ejected from the body.

If a contaminant reaches the alveolar sacs it is more than likely to be exhaled since 90% of the air that we breathe is immediately exhaled. If the foreign substance remains in the alveolar sacs, our immune system releases a scavenger cell to attack and remove the foreign particle. The scavenger cells are known as free alveolar macrophages.

In the immunocompromized individual, one or more of these de-

fense mechanisms fail to function or function improperly, allowing the foreign substance to remain trapped in the lung and possibly create an adverse reaction within the lung.

Even in the healthy individual, the contaminant can overwhelm the immune system, triggering a histamine reaction. This is commonly seen in individuals with allergies.

An *allergen* is a substance that elicits an anti-body response, which is responsible for producing a reaction in immune system mediators. A chemical is released causing injury to the surrounding tissue, which becomes a visible sign of the allergy. Fungal allergens are proteins found either in the mycelium or in the spores themselves. Only a few fungal allergens have been characterized as allergenic, but it is believed that all fungi are potentially allergenic. For individuals who are allergic to mold, the common effects include hay fever symptoms.

The Institute of Medicine in 1993 reported allergens from mold are associated with *allergic rhinitis/conjunctivitis*, allergic asthmas and *hypersensitivity pneumonitis*. The Center For Disease Control has reported that individuals with chronic respiratory diseases such as chronic obstructive pulmonary disease and asthma may experience difficulty breathing when exposed to mold. Furthermore, people with underlying immune suppression disease or other underlying lung diseases are more susceptible to fungal infections. It has been reported that molds can cause infections in susceptible people, particularly in hospital settings. It has been found that 9% of hospital-acquired infec-

tions are caused by contact with fungi.

There have been numerous reports of the epidemic of asthma in this county. The Institute of Medicine in 2000 reported in *CLEANING THE AIR: ASTHMA INDOOR AIR EXPOSURES*; that there was sufficient evidence of an association between exposure to mold and the exacerbation of asthma, but further concluded that there was insufficient evidence to state that mold exposure itself causes the development of asthma. The Center For Disease Control began a five-year study on work-related asthma in 1999. To date, the Center reports the following:

1. There are sufficient relationships between reports of work-related respiratory disease and visual assessment of water and mold damage.
2. There are sufficient relationships between endotoxins and ultra fine particles in the air with work-related respiratory systems.
3. There are sufficient relationships between mold on chair and floor dust and work-related respiratory systems.

The study is not complete and The Center For Disease Control has not indicated what their final conclusion will be on the relationship between asthma and mold.

There have been numerous reports in the industrial and agriculture settings of various forms of *hypersensitivity pneumonitis*, allergic responses and infectious respiratory diseases attributable to mold exposure. *Hypersensitivity pneumonitis* has been reported in office buildings in relation

to exposure to mold contaminated humidifiers and ventilation systems (American Journal of Epidemiology 125; 631-638).

“Farmers lung” is a classic example of an occupational disease produced by mold. It occurs from inhaling moldy dust, which is naturally found in hay, straw or grain. The most notable systems can occur 48 hours after exposure. Typically, the systems include: fatigue, chills, shortness of breath or soreness in the chest. As the disease advances, the individual may experience severe shortness of breath on exertion, headaches and irritating cough. Farmers or grain handlers who develop these symptoms after numerous exposures have been found to exhibit pulmonary fibrosis, scarring of the tissue of the lung parenchyma. The condition can become chronic and irreversible. Consult The National A.G. Database 2002 on Mold Disease in Agriculture.

Two mold producing toxins, *Aflatoxin* and *Ochratoxin*, have been classified by the National Toxicology Program as a human carcinogen. Repeated ingestions of these toxins in contaminated foods have been associated with liver and kidney tumors in both animals and humans.

Lawsuits have been brought alleging that idiopathic pulmonary hemorrhage in infants is related to mold exposure. These conditions were primarily found in urban areas and primarily in rental housing.

In 1994 and 1997, The Center For Disease Control reported two clusters of acute pulmonary hemorrhage in infants, one in Cleveland, Ohio and the other in Chicago, Illinois. Initial studies were conducted to determine

the relationships between these clusters and mold exposures. The initial studies were reviewed by The Center For Disease Control External Expert Panel, which identified shortcomings in the conduct of the studies. By 1999, the external panel concluded that the investigations did not prove an association between acute pulmonary hemorrhage in infants and exposure to the mold *stachybotrys chartarum*. In November, 2002, The Center For Disease Control, in its official statement on mold, stated there was no proof that idiopathic pulmonary hemorrhage in infants was related to mold exposure, but that the situation should be monitored. This year, 2004, The Center For Disease Control has created a proposed criteria for a clinically confirmed case of idiopathic pulmonary hemorrhage in infants; see: www.cdc.gov/neceh/airpollution/mold/aiphicasedef.htm.

The Center For Disease Control asked the Institute of Medicine to conduct a comprehensive review of the scientific literature regarding the relationship between damp or moldy indoor environments and the magnification of adverse health effects. The Institute’s Medical Panel of experts recognized challenges to this study. They noted that mold spores are ubiquitous, found in the air and on all materials. There is no indoor space free from mold. They also noted that mold growth is usually accompanied by bacterial growth, which is responsible for adverse health effects.

The Committee recognized that lack of knowledge regarding the role of micro-organisms in the development and exacerbation of the disease is due largely to the lack of valid quantitative exposure assessment methods and

knowledge of specific microbial agents considered responsible for the presumed health effect. Very few biomarkers of exposure to biologic agents have been identified and the validity for exposure assessment in the indoor environment is often not known. The entire process of fungal-spore aerosolization, transport, deposition, resuspension and tracking, all of which determine a relationship to exposure, are poorly understood, as is the significance of exposures to fungi through dermal contact and ingestion.

The Committee used a uniform set of categories to summarize its conclusions regarding the association between health outcomes and exposures to indoor dampness or the presence of mold or other agents in damp and indoor environments. These categories include:

- Sufficient Evidence of a Causal Relationship**
Evidence is sufficient to conclude that a causal relationship exists between the agent and the outcome. That is, the evidence fulfills the criteria for a sufficient evidence of an association and, in addition, satisfies the following criteria: strength of association, biological gradients, consistency of association, biological plausibility, coherence and temporally correct association.
- Sufficient Evidence of an Association**
Evidence is sufficient to conclude that there is an association. That is, an association between the agent, and the outcome has been observed in studies in which change, bias and confounding, can be

ruled out with reasonable confidence.

- Limited or Suggestive Evidence of an Association**
Evidence as suggestive of an association between the agent and outcome but is limited because change, bias and confounding, cannot be ruled out with confidence.
- Inadequate or Insufficient Evidence to Determine Whether an Association Exists**

The available studies of

insufficient quality, consistency or statistical power to permit a conclusion regarding the presence of an association. Alternatively, no studies exist that examine the relationship.

Utilizing this criteria, the Committee findings regarding the relationship between damp indoor environments, mold and symptoms were as seen in figure 1-3:

Figure 1

- Sufficient Evidence of an Association**

Upper Respiratory track symptoms (nasal and throat)	Wheeze
Cough	Asthma symptoms in sensitized persons

Figure 2

- Limited or Suggestive Evidence of an Association**

Dyspnea (shortness of breath)	Asthma development
Lower respiratory illness in otherwise healthy children	

Figure 3

- Inadequate or Insufficient Evidence to Determine Whether an Association Exists**

Airflow obstruction (in otherwise healthy person)	Skin symptoms
Mucous membrane irritation syndrome	Gastrointestinal tract problems
Chronic obstructive pulmonary disease	Fatigue
Inhalation fevers (nonoccupational exposures)	Neuropsychiatric symptoms
Lower respiratory illness in otherwise healthy adults	Cancer
Acute idiopathic Pulmonary hemorrhage in infants	Reproductive effects Rheumatologic and other immune diseases

While the current report stresses the need for further research regarding the health effects of exposure to damp environments or to mold, the primary recommendation from the Institute of Medicine was to help building owners or dwellers identify sources of damp environments, control them and eliminate them. Such elimination would result in a reduction of symptoms.

While claims continue to be made concerning the health effects of exposures to mold, the current report of the Institute of Medicine indicates that there is no epidemiological basis for the vast majority of these claims. Experts who make such claims would be out of the mainstream of the current scientific thinking and their opinions and conclusions would be the subject of Daubert-type attack prior to their testimony in any lawsuit. In light of the Institute of Medicine's call for additional investigation once involved in mold litigation, those involved with existing or potential mold-related litigation should keep current with the science and continue to review the positions of The Center For Disease Control on this topic, which can be found on its website.

For further information consult the following:

- A BRIEF GUIDE TO MOLD IN THE WORKPLACE; OSHA

- CAUSES AND SYMPTOMS OF MOLD AND DUST-INDUCED RESPIRATORY ILLNESS, 2002; National AG Safety Database
- A BRIEF GUIDE TO MOLD, MOISTURE IN YOUR HOME; U.S. E.P.A.
- ASTHMA AND INDOOR ENVIRONMENTS; U.S. E.P.A.
- MOLD REMEDIATION IN SCHOOLS AND COMMERCIAL BUILDINGS; U.S. E.P.A.
- THE FACTS ABOUT MOLD, FOR EVERYONE; AIHA
- MOLD; Center for Disease Control



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Segal McCambridge Singer & Mahoney, Ltd. was founded in 1986 and has grown to having offices in Chicago, Illinois, Austin, Texas, Philadelphia, Pennsylvania, Princeton, New Jersey and Brighton, Michigan. It represents a wide variety of clients in products liability, medical malpractice, professional liability, municipal and public officer liability, construction litigation, general defense and toxic tort defense. The founding partners' experience in toxic tort cases dates back to the 1970's in pesticide and asbestos litigation. Today, the firm acts as national coordinating counsel in asbestos litigation

to numerous companies including Garlock, Anchor Packing, Congoleum, Weil-McLain, Durametallic, DAP and Chicago Fire Brick. The firm also acts as national trial counsel for these and others in asbestos litigation. Segal McCambridge Singer & Mahoney, Ltd. also acts as national coordinating and trial counsel for Safe Skin in the latex glove litigation. The philosophy of Segal McCambridge Singer & Mahoney, Ltd. has remained the same since its inception: provide state-of-the-art legal services with an extraordinary level of responsiveness and personalized attention to each client and each case.

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