SENSOR

Occupational Lung Disease Bulletin

Massachusetts Department of Public Health
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Dear Health Care Provider,

In this Bulletin, the Occupational Health Surveillance Program (OHSP) summarizes the recent Institute of Medicine (IOM) report on mold, damp environments and associated health effects. A CDC sponsored IOM panel reported that both mold and indoor dampness are associated with symptoms of asthma in susceptible people, and that excessive indoor dampness is a public health problem.

The number of work-related asthma (WRA) cases associated with mold reported to OHSP has increased dramatically over the last 10 years. This may be ascribed to a true increase in cases associated with mold and/or increased awareness of mold as a hazard. Only 5 cases of WRA attributed to mold were reported from 1993—1996; mold was not among the top ten agents reported. By 2002, 53 people with WRA had identified mold as one of three asthma triggers coded in our data, and mold was the third most frequently reported exposure.

The IOM report draws a link between damp building conditions, upper respiratory symptoms and asthma. Dampness is associated with coughing, sneezing and nasal and throat symptoms. Those with allergies to mold may develop asthma. Clinicians cannot predict who will become sensitized; protecting all workers from damp conditions and mold will reduce the incidence of WRA.

NIOSH has been involved in mold and indoor air quality research, establishing exposure response relationships, exploring microbial exposure indices in relation to health, conducting assessments, developing a detection method for Stachybotras, and measuring intervention effectiveness.

Remember to report suspected and confirmed cases of occupational asthma to the Occupational Health Surveillance Program by phone, fax or mail. Case reporting is mandated by public health regulations, and allows us to identify hazardous exposures in our state and plan informed prevention strategies. Please let us know if there is anything that we can do to reduce barriers you may face in reporting cases of occupational asthma.

To receive your *Bulletin* by e-mail send a message to Occupational.Asthma@state.ma.us.

Sincerely,
Elise Pechter MPH, CIH

Damp Indoor Spaces and Health

Committee on Damp Indoor Spaces and Health, Institute of Medicine of the National Academies

http://books.nap.edu/catalog/11011.html

Escalating concern about the adverse effects of mold on human health led the Centers for Disease Control and Prevention to request a comprehensive review of the scientific literature on this subject. The Institute of Medicine (IOM) conducted the study, focusing on the relationship between damp or moldy indoor environments and adverse health effects, especially respiratory and allergic symptoms. They limited their report to exposures in homes, schools and office buildings, and excluded studies in barn, silo and factory environments. The 370 page report was released online in prepublication form by the National Academies Press (www.nap.edu) May 25, 2004.

Mold

Mold refers to a variety of organisms in the fungus family. The terms mold and fungus are used interchangeably in the report. Mold spores are ubiquitous in both indoor and outdoor environments. Adverse health effects from molds have been attributed to specific species, particular cell components (spores, hyphal fragments), as well as release of volatile organic compounds and mycotoxins. Concern was heightened in the 90's by reports of idiopathic pulmonary hemorrhage in infants which was attributed to *Stachybotrys chartarum*, also called "toxic mold." While such toxic effects are biologically plausible, verification is needed.

Methods for evaluation of exposures to mold have been limited to direct observation of mold and/or mildew, counting cultured colonies, and identifying and counting spores. These methods have variable and uncertain relationships to allergen, toxin and irritant content of exposures. Valid exposure assessment methods and reproducible information about which specific microbial agents cause health effects are lacking.

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Table 1. Summary of findings regarding association between health outcomes and damp indoor environments and health outcomes (Table ES-1, from IOM report)

Sufficient Evidence of an Association
- Upper respiratory (nasal and throat) tract symptoms
- Cough
- Wheeze
- Asthma symptoms in sensitized persons

Limited or Suggestive Evidence of an Association
- Asthma development
- Dyspnea (shortness of breath)
- Lower respiratory illness in otherwise healthy children

Inadequate or Insufficient Evidence to Determine Whether an Association Exists
- Airflow obstruction (in otherwise healthy persons)
- Mucous membrane irritation syndrome
- Chronic obstructive pulmonary disease
- Inhalation fevers (nonoccupational exposures)
- Lower respiratory illness in otherwise healthy adults
- Acute idiopathic pulmonary hemorrhage in infants
- Skin symptoms
- Gastrointestinal tract problems
- Fatigue
- Neuropsychiatric symptoms
- Cancer
- Reproductive effects
- Rheumatologic and other immune diseases

Dampness

The IOM committee noted that the presence of moisture is the primary factor that promotes mold growth indoors, since nutrients are always present. They expanded their evaluation to dampness and included other related hazards to their review.

In their extensive review of the existing literature, it was difficult to tease apart the health effects of exposure to mold from all other factors that may be influencing the indoor environment from wetness. Dampness favors the growth of mold, but also favors house dust mite proliferation, bacterial growth, cockroach and rodent infestations and chemical emissions from leeching or breakdown of building materials and furnishings. The term dampness describes the widespread variety of moisture problems including high relative humidity, condensation, leaks and other signs of excess moisture.

The committee reviewed published scientific journal articles and categorized the strength of evidence supporting the association of dampness and molds with health effects into three categories: "sufficient," "limited or suggestive" or "inadequate." Table 1 shows the results of this review, systematically attributing symptoms associated with dampness based on research findings. In the full report, a separate table categorizes the evidence for mold and health effects.

The committee found sufficient evidence for a link between damp conditions with coughing, wheezing and other upper respiratory tract symptoms in otherwise healthy people. They also found that damp conditions were associated with asthma symptoms among those who are sensitive to mold. There is limited or suggestive evidence that damp conditions are associated with the development of asthma and shortness of breath in healthy children. Insufficient evidence was found to determine an association with a number of other reported health effects, including gastrointestinal problems, fatigue, neuro-psychiatric symptoms and skin problems.

Moisture and mold problems stem from building design, construction and maintenance practices and building materials that retain wetness. Technical information about controlling dampness exists, but architects, engineers, building contractors, facility managers and maintenance staff do not always apply this knowledge. The committee called for national strategies to avoid conflicting advice on preventing indoor dampness. They called for discussion and action on assessing and monitoring for dampness, modification of building codes and building contracts, public health research and broad based education for health professionals and people involved in the design, construction, management and maintenance of buildings to improve efforts to avoid or reduce dampness.

Resources on mold and dampness:
- CDC, NCEH, Mold Links
  www.cdc.gov/nceh/airpollution/mold/links.htm
- EPA Mold Remediation in Schools and Commercial Buildings
  www.epa.gov/mold/images/moldremediation.pdf
  www.epa.gov/mold/moldresources.html
- OSHA Issues Safety and Health Information Bulletin on Mold
  www.osha.gov/dts/shib/shib101003.html
- Mold: Worker Guideline for Handling Removal Being Developed; Scientific Questions Remain
  www.wetp.org/Wetp/public/dwloads/HASL_782dnlfile.PDF
- MDPH BEHA Methods to Prevent Mold in MA Schools
  www.mass.gov/dph/beha/iaq/mold/reduce_humidity.htm

MDPH CEH ER/IAQ can investigate mold in schools
- American Industrial Hygiene Association
  www.aiha.org/GovernmentAffairs-PR/html/prmoldsources.htm

Number of Work-Related Asthma Cases Reported to Massachusetts SENSOR

June	July	August	Total (3/92 – 8/04)
6	0	6	988