

# Mold Awareness



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# Economic Factors

- There are about 94.7 million households or units in the U.S.
- Of these homes, 47 million were built between 1959 and 1975.
- Median age of a home is 30 - 40 years old



# Economic Factors

- 60% of residential issues in post 1970 housing
- 20% from older (pre-1960) housing that has been substantially renovated
- 10% of issues in properties not yet occupied

# Water Infiltration

- Major cause of mold growth
- Present in app. 75% of all properties
- 70% of all homes show potential for mold growth
- Should be corrected immediately upon discovery or as caused (fires) – within 48 hours maximum

# When Is It A Problem?

- When:
  - Growing in large concentrations
  - Actively producing spores and gases that become airborne and are inhaled in large numbers

# How Mold Grows

- Finds suitable conditions
  - Water
  - Food
  - Temp (hot or cold)
- Grows
- Spreads

➔ **Creates toxic environment**

# Mold on Sheetrock



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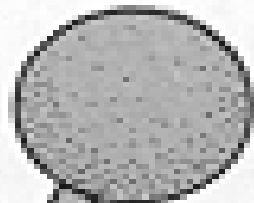
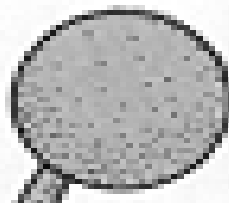
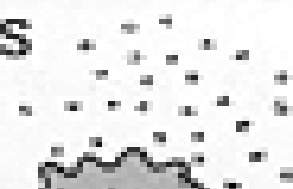
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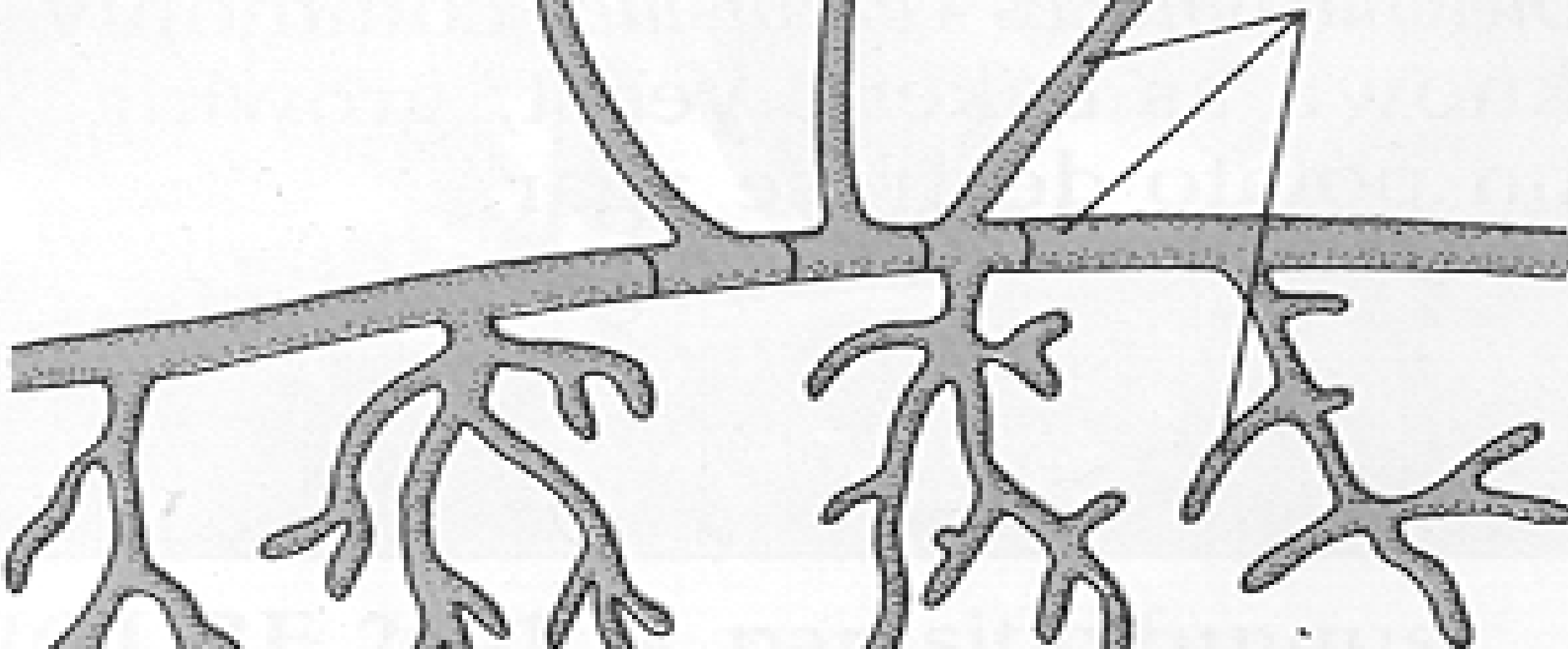
# What Is Mold?

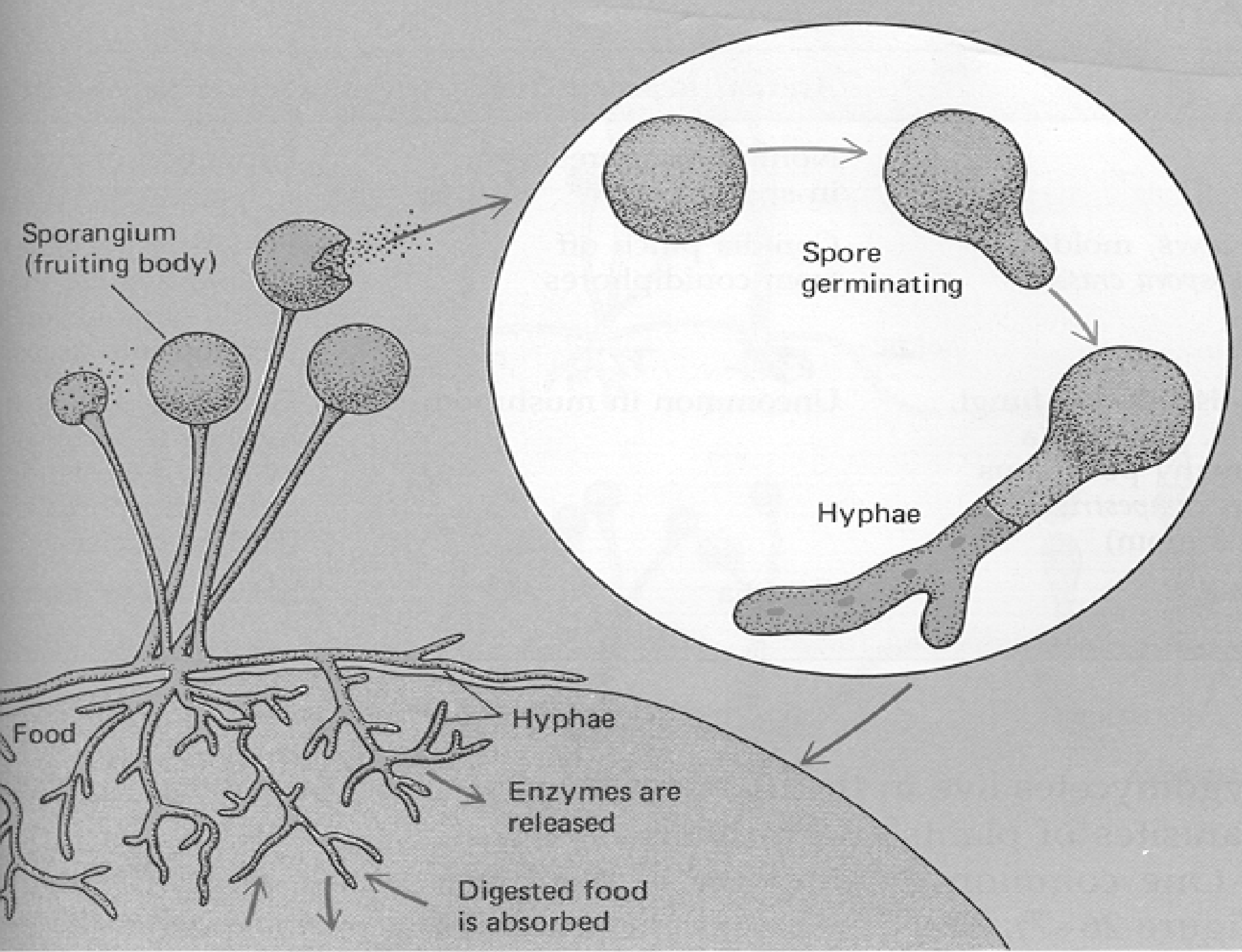
- Microscopic organisms whose purpose in the ecosystem is to break down dead materials
- Reproduce by airborne spores (Bioaerosols)
- Produce toxic gas
- Is everywhere

Spores

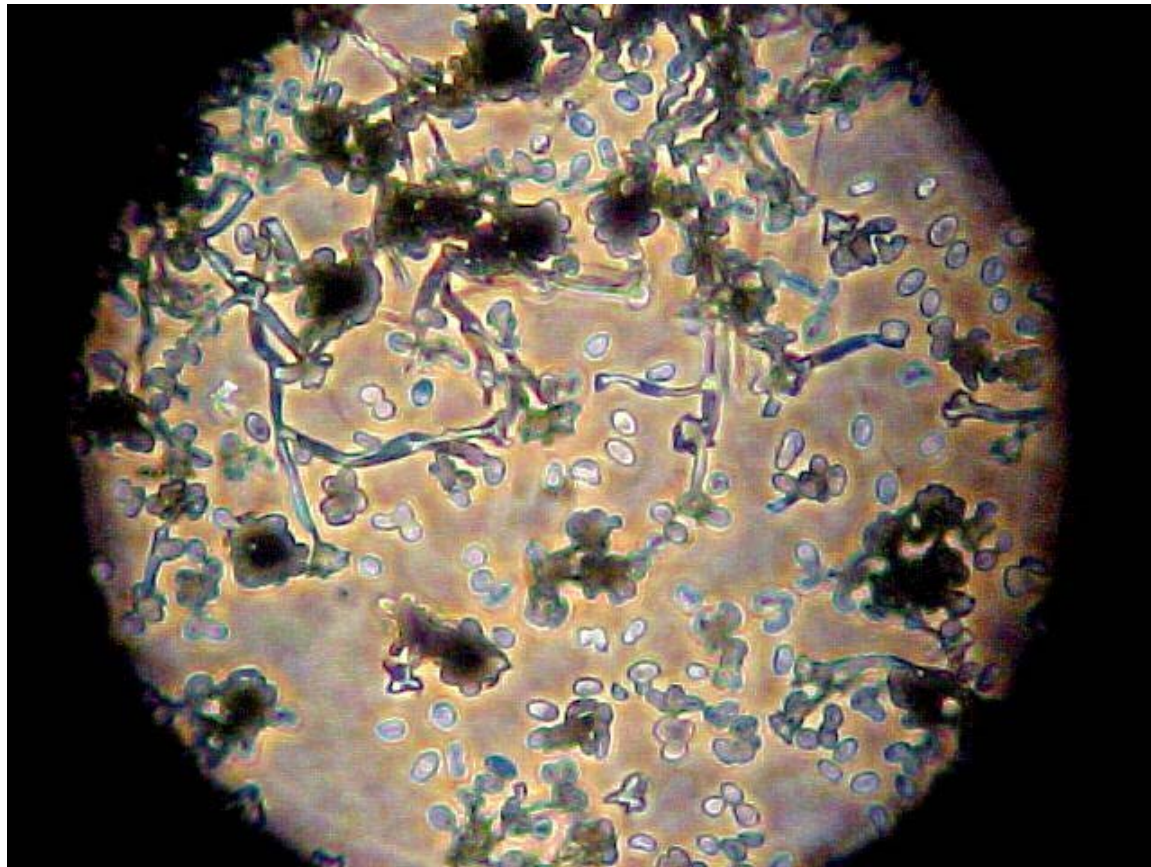


Hyphae

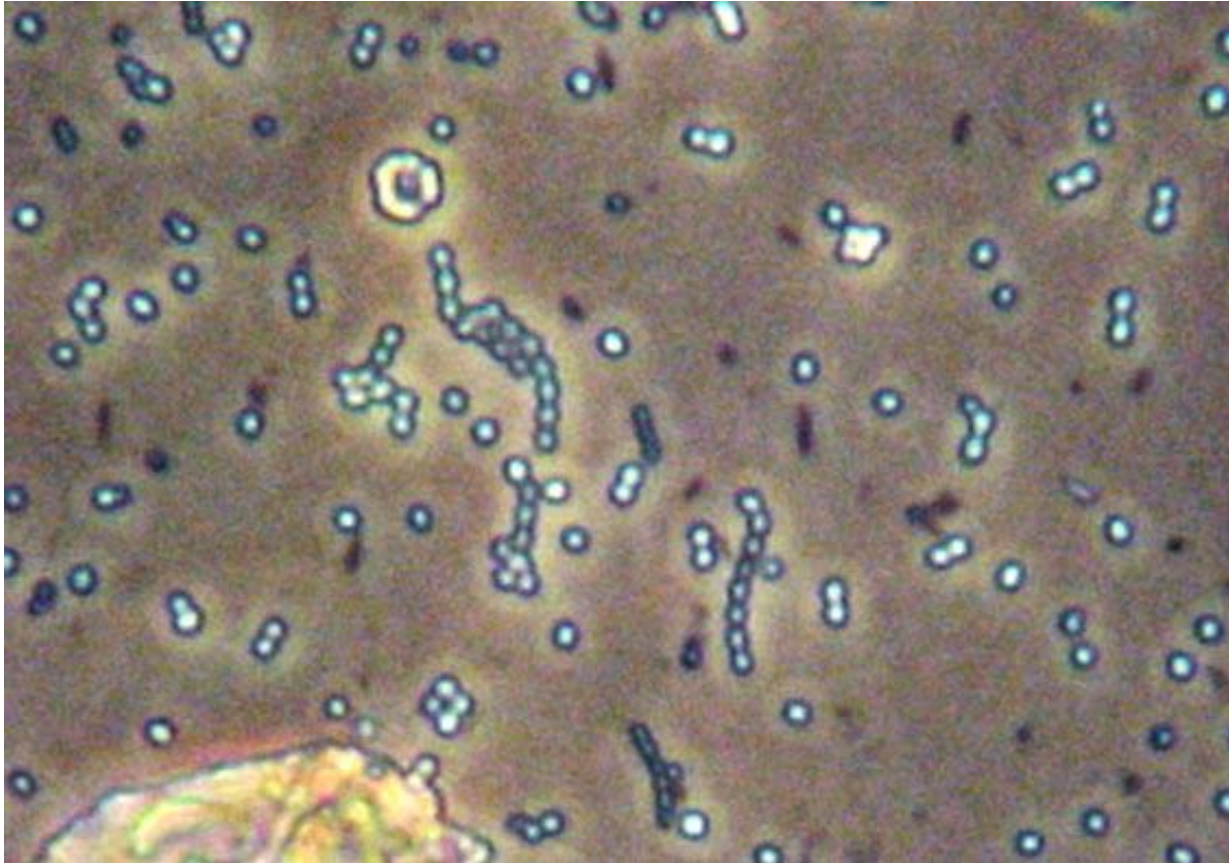




# Stachy Polarized Light Microscope



# Aspergillus



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# Mold Exposure

- Inhalation – most common
  - Respiratory disease
  - Allergic reaction
  - CNS dysfunction
- Dermal – irritation/infection
- Ingestion - infection
  - Direct via contact
  - Indirect via foods/objects



## CASE STUDY

# IMPROVED ASTHMA CONTROL AFTER REMEDIATION OF ENVIRONMENTAL *STACHYBOTRYS* CONTAMINATION

Christopher D. Miller, MD; Susan M. Flappan, MS, CIH; Jay M. Portnoy, MD

### INTRODUCTION

Fungal mycoses have been implicated in human and animal disease. In this case report, we propose that a non-IgE-mediated mechanism, and probably fungal mycotoxins, were responsible for a worsening of asthma symptoms in a toddler. We also demonstrate the importance of environmental assessment and the effects of environmental remediation.

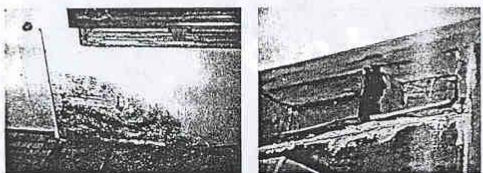


Figure 1. Walls contaminated with a black, slimy fungus later identified as *Stachybotrys*.

pad was removed and the original carpet was reinstalled.

An inspection of the basement identified two areas of wallboard and wood structure with what appeared to be fungal contamination (Figure 1). Surface samples of these areas later revealed numerous fungal species, including *Stachybotrys*, *Chaetomium*, and *Cladosporium* (Figure 2). Air samples, collected with a volumetric grab sampler, revealed elevated spore counts throughout the house (Table 1). In particular, the spore counts were highest in the patient's bedroom and in the playroom located in the basement. *Stachybotrys* spores were also identified in the basement air samples.

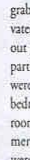


Figure 2. Photomicrographs of *Stachybotrys* isolated from a contaminated surface.

### CASE REPORT

A 2-year-old white male with a previous history of asthma was brought to our allergy clinic with asthma symptoms that were not well controlled by his current medical therapy of a  $\beta_2$ -agonist. The patient's symptoms of cough, rhinorrhea, sneezing, ocular irritation, and wheezing first arose when he was 8 months old. His symptoms were perennial and more prevalent in the morning and evening. His family history was negative for atopic disease.

On physical examination, the patient appeared to be an active 2-year-old in no apparent distress. He was in the 20th percentile for height and weight and, according to his parents, his growth and development were normal. Physical examination was unremarkable except for pale nasal mucosa. Respiratory wheezing was documented during prior visits to his primary care physician.

Initial workup included prick skin testing, which yielded negative results for molds, cat, dog, dust, cockroach, and dust mite. The patient had appropriate positive and negative controls. His serum IgE was 27

IU/mL, with normal being 0 to 99 IU/mL.

Daily anti-inflammatory treatment consisting of fluticasone delivered through a spacer and mask was started. Long- and short-acting  $\beta_2$ -agonists were also prescribed for worsening or breakthrough symptoms.

Despite these interventions, the patient's symptoms persisted. Because the initial history revealed water leakage in the basement of his home, it was decided to perform a home environmental assessment—some-

thing for which his parents expressed a great deal of enthusiasm.

The patient's home was a 12-year-old, detached, bi-level house in an upper-middle-class suburb. It had a wood-burning fireplace, a central gas forced-air heating system, central air conditioning, and a finished walkout basement with carpeting. Severe water leakage in the basement occurred on two occasions after heavy rainfall. After the first event, the wet carpet

TABLE 1  
RESULTS OF AIR SAMPLE TESTS (SPORES/M<sup>3</sup>)\*

	Sample Dates		
	11/13/97	12/11/97	2/12/98
Kitchen	10,000	800	0
Patient's room	11,200	1,600	100
Basement	12,200*	3,600	100

\*Spores identified as *Stachybotrys*.

Dr. Miller is an allergy fellow, Dr. Portnoy is Program Director, and Ms. Flappan is an indoor air quality specialist, all at The Children's Allergy Hospital, Section of Allergy, Asthma and Immunology, Kansas City, Mo.

The patient's quality of life, assessed with a tool described by Juniper et al,<sup>1</sup> improved dramatically with home remediation (Figure 3). In addition, he was weaned from his anti-inflammatory medications and has remained asymptomatic, with no further wheezing exacerbations and a significant decrease in rhinitis symptoms. Follow-up air

# Health Effects

- **Flu symptoms/headaches**
- **Allergic Reactions**
- **Respiratory failure/asthma**
- **Nose bleeds/bleeding lungs**
- **Neurological disorders**

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says Ob-Gyn David Campbell Walters, author of "Just Take It Out!" He says the evolution of the human head has made it too big to fit comfortably into the birth canal. A 1997 study found that 31 percent of female British obstetricians would prefer to deliver their own babies by cesarean.

Vaginal delivery can have serious—and costly—medical consequences. Especially if doctors use mechanical interventions, such as forceps, vacuum extraction or episiotomy, vaginal delivery can increase the risk of lasting problems like gas and urinary incontinence. And long labors—particularly when followed by unplanned C-sections (and lawsuits)—can add thousands to the overall price tag.

Vaginal births after cesareans (VBAC) can be dangerous. Many women with prior cesareans don't want to risk rupturing the uterus during labor, so they often reject the medical establishment's encouragement to undergo a VBAC. "If a woman ruptures her uterus, you have about 17 minutes to have the baby out before you begin to have [brain] damage," says Dr. Roger Freeman, chair of the American College of Obstetricians and Gynecologists task force on cesarean-delivery rates. ACOG said in August of 1999 that a physician should be "immediately" available, not just "readily available," during VBACs. That's not always possible, especially in rural areas. If a clinic isn't equipped to perform VBAC safely, cesarean delivery isn't just a convenience but a practical necessity.

In the end, both sides are half right. Vaginal delivery is the cheaper method of childbirth—and, unlike a cesarean, is not major abdominal surgery. But from the perspective of some Ob-Gyns, restricting a woman's right to choose a form of childbirth makes no more sense than forcing her into the cheaper of two cancer therapies. "In natural childbirth," says Walters, "we don't even mention that there is an alternative. They're not told their bladder is likely to be negatively impacted. They're not told about the possibility of worse sexuality. We are keeping the advantages of cesarean delivery secret."

A cesarean isn't for everyone—and insurance may not cover it if you're doing it just for your own convenience. Talk to your doctor to decide whether a C-section is right for you. Wanting more peace of mind after a previous cesarean or being certain your own doctor is on hand may be reason enough. Just make sure you understand the risks as well as the benefits. ■

YOUR HOME

## A Hidden Health Hazard

Sneezing and sniffing? Maybe the problem isn't a cold but mold. It's more dangerous than you think.



David Sherris at the Mayo Clinic performed a study of 210 patients with chronic sinus infections and found that most had allergic fungal sinusitis. "The prevailing medical opinion has been that mold accounted for 6 to 7 percent of all chronic sinusitis," says Sherris. "We found that it was 93 percent—the exact reverse."

More rarely, molds appear to cause problems like Karabell's. These aren't just allergies but reactions to toxins. Certain molds produce poisons in order to kill off competing fungi and bacteria. Risks of toxicity increase with the amount of mold—and flooding and leaks can supply the moisture that molds need to thrive.

If you believe you have a mold-related illness, consult an allergist or an environmental-health specialist. (If you can see or smell mold, that's a good clue.) They will at least be able to confirm the diagnosis and proceed accordingly. The best remedy of all is simply to get rid of the mold. Small blooms on the surface of walls can be removed with a weak solution of chlorine bleach. Wear rubber gloves, open the windows for ventilation and throw out the sponge afterward. A face mask could also be a good idea. "Dead or alive, mold still contains the proteins that provoke allergies," says J. David Miller, a mold specialist at Carleton University in Canada.

If your home has more extensive water damage, remediation may be the only answer. Seek professional help. You need to fix leaks, replace moldy drywall and improve ventilation. Beware of built-in humidifiers in forced-air heating systems. "Molds and slime build up there and never get cleaned out," says Jack Spengler of Harvard. New York City has guidelines on remediation at [www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1.html](http://www.ci.nyc.ny.us/html/doh/html/epi/moldrpt1.html). California state also has fact sheets at [cal-iaq.org/iaqsheets.htm](http://cal-iaq.org/iaqsheets.htm) to help you to a healthier home environment. ■

BY ANNE UNDERWOOD  
DEENA KARABELL HAD LIVED in her New York City apartment for 15 years, so when she fell ill in 1983, she never suspected that her apartment itself could be to blame. Over the next 15 years she grew progressively weaker. Finally, in the spring of 1998, she lost 30 pounds and went into anaphylactic shock three times. She literally lay dying in her bedroom when a hired nurse noticed a strong odor of mold in the closet. Suddenly things clicked. Karabell's family moved her out immediately. Today— at a safe distance from the mold—she is almost back to normal. "People are amazed at my recovery," she says.

Molds have been an underrecognized health problem, but that is changing. Health-care professionals now know that molds can cause allergies, trigger asthma attacks and increase susceptibility to colds and flu. Anyone with a genetic predisposition can become allergic if exposed repeatedly to high enough levels. Last year Dr.

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# Agency Guidelines & Recommendations

- New York City Department of Health
  - Cleanup Standards
- USEPA
  - Info for Homeowners & Renters
  - Schools & Commercial Buildings
- NIOSH
  - IAQ Guidelines for Building Owners & Faculty Managers

# International Standards

- Environment Canada –  
recommendations for testing
  - Canadian Mortgage & Housing Corp. –  
standards for cleanup
- France, Germany, Italy, Japan, UK &  
Netherlands preparing legislation

# Texas Health Department

- Establishes accreditation, certification and licensing program.
- Identifies investigation and abatement disciplines
- Sets forth work practices and clearance standards
- Requires notification and disclosure

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