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STACHYBOTRYS EXPOSURE AND BLEEDING LUNGS: THE EXPERIENCE OF ONE PHYSICIAN

The possible linkage between exposure to airborne concentrations of *Stachybotrys* mold spores and bleeding of the lungs (*i.e.* pulmonary hemosiderosis) is controversial. In the United States, this association between contaminant and symptoms was first postulated by doctors Dorr Dearborn and Ruth Etziel in relation to a number of infant deaths and near deaths in 1994. Since this study of health problems involved both the clinical pediatrician (Dearborn) and an investigator from the Centers for Disease Control and Prevention (Etziel), the CDC accepted their findings of *Stachybotrys* as the probable cause of the infant symptoms. However, a later panel set up by the CDC to review the work of Dearborn and Etziel concluded that the association of the mold to the babies' injuries could not be proven. Although the review did not conclude that *Stachybotrys* was ruled out as a cause and Dearborn/Etziel published a rebuttal to the review, the official position of most professionals in the mold control industry is that *Stachybotrys* has not been proven to cause bleeding from the lungs.

Despite these official pronouncements, doctors, consultants, and contractors continue to receive reports of significant symptoms, including coughing up blood from the lungs, from occupants of mold-contaminated buildings. This article presents information from one such case. Its credibility is enhanced by the fact that the impacted individual is a physician who compiled detailed charting of her symptoms and diagnostic/treatment experiences. It is further strengthened by the history of the situation which involved the doctor occupying a water-damaged environment and experiencing progressively worse symptoms for several years prior to her exploring a possible connection between mold exposure and her condition.

This paper is a summary of both the occupant's situation and the investigative and remediation efforts that took place. Observations of similarities with other cases investigated by Wonder Makers Environmental are also included. It concludes with a recommendation that all professionals involved in mold contamination situations look more conscientiously at anecdotal data as well as scientific when evaluating the possibility of *Stachybotrys* causing symptoms such as pulmonary hemosiderosis.

Case Study

Dr. X is an obstetrician/gynecologist who resides and practices in an upper Midwest state. At the time of the investigation, in late 2000, she was 44 years old. Dr. X had a private practice in rented office space where she employed a receptionist and a nurse/assistant. Her journey, which began as far back as 1995, is one that is fairly typical of what we hear from clients in our investigation processes. Often by the time they contact us about mold or indoor air quality investigations, they report suffering a whole series of health effects.

Initially, Dr. X assumed that she was especially susceptible to the winter colds that were going around; she was experiencing fatigue, muscle aches, and flu-like symptoms. But by 1996 her respiratory distress was increasing—coughing, burning airways, and a heavy feeling in her chest. We have seen support in

some medical data for this being symptomatic of *Stachybotrys* exposure. By 1997 Dr. X began documenting her symptoms of violent coughing in order to get help. She had graduated from the University of Michigan and this provided her with access to some of the best health care in the nation. She went back to her medical school and talked to many of her professors. When she developed bleeding of the lungs, she consulted the professor at Michigan who wrote the standard section on pulmonary hemosiderosis in the medical textbooks. None of the doctors she consulted could identify a cause of her bleeding lungs. She was, indeed, bleeding from her lungs, not from any aspect of her upper respiratory system such as a dry nose, which was later questioned.

By 1999, the episodes of bleeding from the lungs were recurring more frequently. Dr. X was “cycling” in terms of severe symptoms. She would get better for a short period of time, then as soon as she went back to work the symptoms would begin to increase again. By 2000 the symptoms had taken a toll on her and she was hospitalized many times. At one point her doctors did not think she was going to survive. Dr. X called her lawyers to her bedside, as well as her two young children and husband. A priest was called in to administer last rites. Fortunately, she survived. She recovered at home for several months, then went back to work. The symptoms started to worsen again.

Mold Awareness

At about the time Dr. X was trying to get back to normal following her near death episode, her father-in-law saw a news program that provided web sites about fungus and lung disease. Her symptoms seemed to him to be very similar to those on the news program. She started searching to see if fungal contamination could be a cause. This is when our organization got involved to investigate her office.

Based on her symptoms and subsequent confirmation of *Stachybotrys* mold contamination in both the air and dust in her office, Dr. X talked to a number of doctors at the CDC. The CDC told her that “the bleeding could not be caused by mold.” Because of her desperation, she did not stop there. At our suggestion, she contacted Dr. Dorr Dearborn at the Cleveland Clinic. Dr. Dearborn confirmed that fungus contamination could be a factor.

Dr. X got more aggressive in trying to help herself. She became one of only three adult patients that Dr. Dearborn looked at in the last few years for continuing episodes of pulmonary hemosiderosis. Dr. Dearborn suggested that Dr. X have a bronchial lavage: a procedure where a tube is inserted into the lungs and each lobe is flushed with water and suctioned out at the same time. In the water that was flushed out of Dr. X's lungs, Dr. Dearborn cultured a fair amount of *Stachybotrys*, which was identified visually and by cultured analysis.

Despite the pain of the bronchial lavage, Dr. X reported feeling significantly better within hours of the completion of the procedure. The heaviness in her chest was gone and some of the respiratory symptoms were significantly better than before. Immediately after that, she stopped taking steroids and antibiotics. She was convinced that she had been suffering from ill health effects caused by *Stachybotrys* spores.

Building History

There was water intrusion into Dr. X's office building dating back to the early 1990s. Based on historical data that we were able to gather later, the gutters and downspouts on the back side of the building were ineffective at routing water away from the foundation, resulting in extensive mold growth on the interior drywall. Dr. X had requested that her landlord clean and repair the affected treatment room for a number of years, but it was not done. Later, we found out that there was a secondary moisture source as well.

By the spring of 2000, after Dr. X had complained repeatedly and started to get some information that her symptoms might be related to mold exposure, the landlord hurriedly reacted. A contractor was brought in who ripped out a number of pieces of mold-contaminated drywall without any engineering controls. This, in our opinion, made the situation much worse by contaminating the rest of her office. Fortunately, when the landlord conducted the uncontrolled tear-out of the water-impacted materials, Dr. X held back several samples of drywall material with fungal contamination. The samples were sent to Dr. Yang's lab at P&K Microbiology (see Figure 1). The counts were into the millions of *Stachybotrys* spores per gram of the materials. Obviously there was contamination on the drywall pieces.

As was noted earlier, this was about the time that Wonder Makers became involved in the investigation. We conducted sampling and confirmed *Stachybotrys* contamination of the air and dust in Dr. X's office. We proceeded with developing a work plan, and conducting oversight of the cleaning. Based on the initial airborne and dust sampling, we recommended that Dr. X not enter the building (which was her primary office) until the problem was resolved. We put an additional burden on her by suggesting that she not take any records or materials from her office until they were cleaned. We identified a qualified contractor to do the cleaning. We were called back in early 2001 and found the secondary water source.

Dr. X's Office Environment

Dr. X's office was in a modest office building of approximately 2,000 square feet with 15 small areas. There was known long-term water intrusion in the back treatment room because of poor gutters and downspouts. As stated earlier, the landlord had removed about 35 square feet of black moldy drywall. Dr. X would retreat to her office when she was feeling poorly. As it turned out, there was moisture damage in her office wall as well, due to an automatic sprinkler head that had most likely been knocked askew by a lawnmower.

Because the wall in the treatment room had been torn out incorrectly, we felt that it was important to remediate the area again. So the mold remediation contractor pulled out the new drywall and cleaned all the interstitial space. This was the simplest part of the project. Dr. X had thousands of open medical files, and dust sampling indicated a significant amount of mold spore deposition on the files and office furnishings. As a result, we felt it was better to have the contractor clean all the files and furnishings rather than try to identify which individual items needed cleaning.

Remediation Procedures

Using the New York City and EPA guidelines, as well as the information in the ACGIH (American Conference of Governmental Industrial Hygienists) manual, we set up standard procedures as follows:

1. Seal off the HVAC system
2. Install barriers at the entry to each room or area (Figure 2 shows the building layout with isolation barriers.)
3. Begin work from one end and move progressively toward the decontamination unit at the exterior door
4. Clean each room in a specific pattern:
 - A. Dispose of all unnecessary items as decided by Dr. X
 - B. Clean all items in drawers or files using a "HEPA Sandwich" process:
 - i. HEPA vacuum
 - ii. Wet wipe with a disinfectant
 - iii. HEPA vacuum again

- C. HEPA vacuum all ceiling tiles
 - D. Wet wipe all walls and fixtures, including furniture, moving from back to front
 - E. Thoroughly clean floor or carpet, moving from back to front
5. Thoroughly "air wash" all medical records:
- A. Set up large and small negative air machines so that the filtered exhaust from the small machine is directed into the face of the large machine
 - B. Individually HEPA vacuum each file on the exposed surfaces/edges
 - C. Hold the file in the exhaust air stream just in front of the large negative air machine and slowly flip as if thumbing through a book
 - D. Store the records in small crates until released by testing
 - i. Any random sample that shows spore residue as part of the invisible dust left on the file means that the whole crate of files must be re-cleaned.
6. Re-isolated each room after cleaning
7. Utilize negative pressure throughout the cleaning process both as an overall engineering control and for local exhaust at the cleaning location
8. Use air scrubbing throughout the process to lower airborne spore concentrations
9. Have the air ducts professionally cleaned
10. Collect post-remediation cultured and non-cultured samples

The testing showed that this was a very effective procedure for removing the spores. Anything that had visual growth on it was treated differently: controlled removal and disposal. The contractor disposed of whatever he could to save cleaning time. Primarily we used non-cultured Air-O-Cell cassettes for sample collection, although we did collect cultured samples for confirmation purposes. We set up criteria for post-remediation evaluation based on non-cultured samples so that we could get a quicker turnaround and feedback to the contractors. One of the primary keys for post-remediation was that we were going to allow no *Stachybotrys* spores either in the air or in any of the wipe samples. Initially, 3 of 15 areas didn't meet the work plan criteria and had to be re-cleaned. Negative air machines were run, we re-sampled, and the areas passed. We now felt that we were ready to have Dr. X check the facility.

Re-Occupancy of Dr. X's Office

We brought Dr. X back in with some concern since prior to the remediation she had exhibited symptoms that indicated she was sensitized to the building. She entered the building and said that everything was great except her office. When she walked into her office she said, "Your group hasn't cleaned this or something is wrong in here." Based on the cleaning procedure, we didn't feel that we had missed anything significant, so we started talking to people about other water intrusion incidents. Even though they didn't remember previously, when we pressed them they recalled that one sprinkler head sprayed against an outside wall of the building. That led us to start investigating there, even though it was dry (we had done moisture measurements earlier). At that point we conducted invasive sampling and found an additional source of *Stachybotrys* on the drywall. The contractor sealed the affected area again and followed the same work plan as before. They continued cleaning until the area met the post-remediation criteria established earlier.

Once Dr. X got back into her office she talked to Dr. Dearborn and followed up with a letter to him. Here is an excerpt from that letter:

I've had no further pulmonary hemorrhages, and am feeling the best I've felt in about 3 years. The daily headaches and sinusitis/scratchy throat feeling have been gone for a while. My head feels

clear! I'd been feeling so congested and headachy for so long, I'd just put up with it and the difference now is striking.

This dramatic sort of recovery is not unusual in our experience; people just learn to put up with a certain level of discomfort and feel that it's normal until they get it corrected and realize that it was not normal. Perhaps most important, Dr. X is not the only adult whom we found in this situation. But Dr. X is credible because she is in the medical community, she took good notes, and she went to great lengths to prove or disprove the source of her pulmonary hemosiderosis.

Anecdotal Data As Evidence

Is she just a single individual; an anomaly? Our belief is not. We have to be careful as professionals to give appropriate weight to anecdotal data in these situations, as well as scientific data, and share this information so that proper statistical analysis can be done. The CDC says that the association between *Stachybotrys* exposure and pulmonary hemosiderosis should not be considered proven. But we've seen enough evidence, and we are convinced.

Figure 1. Bulk sample results from drywall pieces

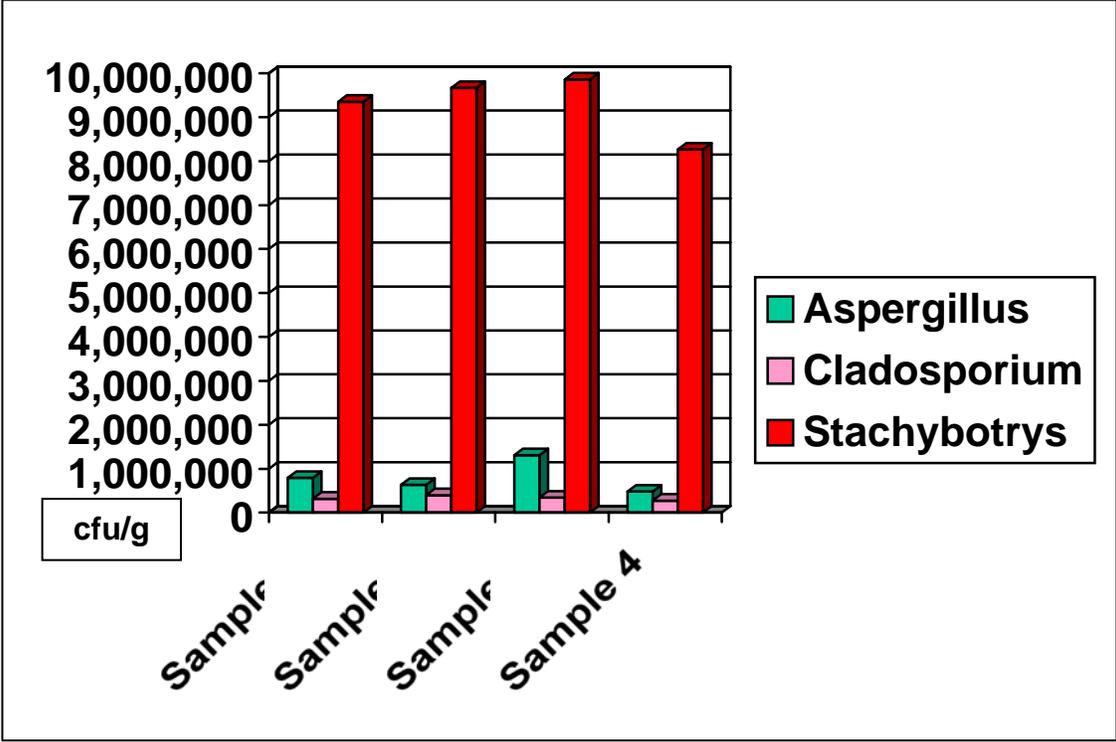
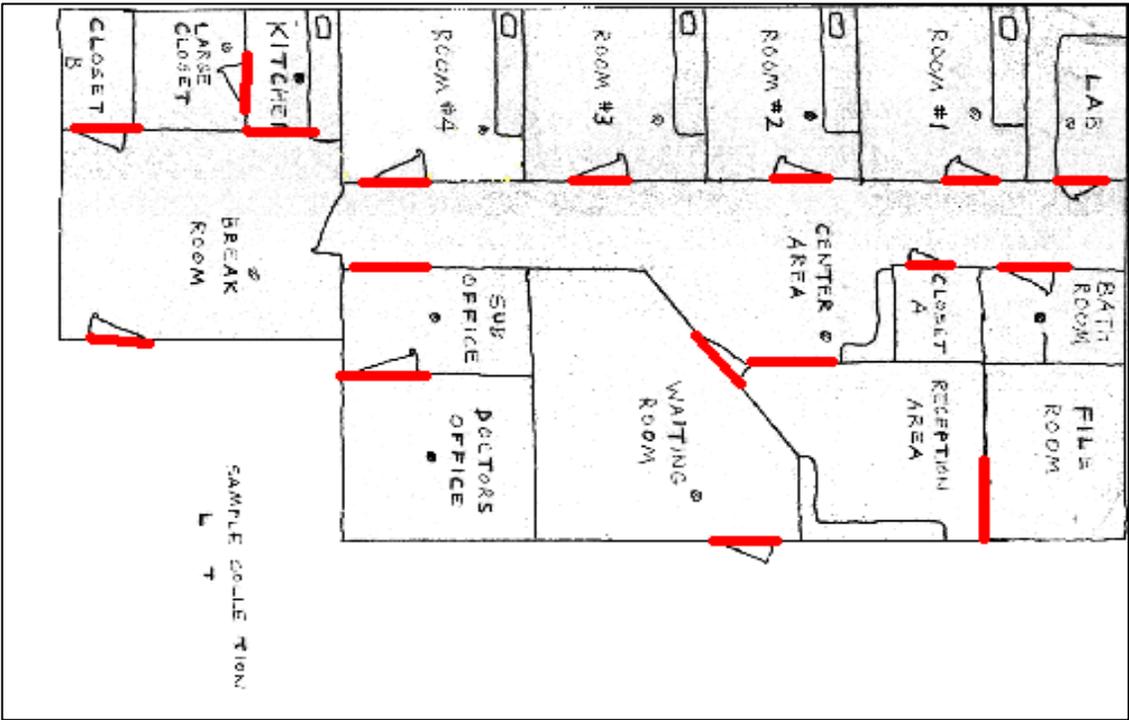


Figure 2. Room barriers



About the authors

Michael A. Pinto currently serves as Chief Executive Officer of Wonder Makers Environmental, Inc. He is a nationally recognized expert in the areas of indoor air quality and biological contamination. His educational background includes a Bachelor of Science degree in philosophy and a Masters Degree in public administration. Michael holds numerous other certifications including Certified Safety Professional (CSP) and Certified Mold Professional (CMP). His expertise in the IAQ area has been recognized by the legal system through his appearance in a variety of cases as an expert witness. He has made presentations regarding the intricacies of indoor investigations at numerous seminars and conferences around the country, and he is an instructor of three levels of RIA-certified mold remediation training that is conducted around the country and in Canada. Michael is the author of three books, including *Fungal Contamination: A Comprehensive Guide for Remediation*, over 114 technical articles, and 18 commercial training programs. He can be reached at 269-382-4154 or map@wondermakers.com.

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