Why Mold Illness Goes Unrecognized

How cheap construction made so many buildings unsafe, why the illness they cause has been dismissed for decades, and the overlooked approaches that allow patients to recover

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Story at a Glance:

- **Mold illness is remarkably common, yet it is routinely missed, as its patients present with a bewildering array of symptoms that rarely fit a recognized diagnosis, and acknowledging it would expose builders, landlords, insurers and schools to almost unlimited liability.**
- **Much of this was avoidable. Modern buildings are sealed tightly, made from materials that feed mold the moment they get wet, and rushed to completion, while far safer alternatives cost only slightly more. Since the builder rarely pays for the mold that follows, a wave of lawsuits now shows this cost is routinely shifted onto the families who move in.**
- **Mold affects people very differently. Some become so sensitive that a brief visit to a moldy building incapacitates them for days, while most people in a damp building never become seriously ill, and the cell danger response explains much of why this happens and why the illness is so often reversible.**
- **Most attempts to remediate homes fail because the repair spreads contamination through the house, and while the most well-known protocol often works, it is too demanding and expensive for many patients.**
- **This article will review how to recognize mold illness, which tests are worth trusting (for both the body and the building), how to find a safe place to live, how to remediate a home in the order that actually works, and the more accessible and economical approaches we have found for addressing each facet of this complex illness (e.g., colonization and sensitization).**

On September 18, Robert F. Kennedy Jr. hosted a Mold Surveillance Roundtable at HHS with the CDC's director, researchers, clinicians and patients[1] where he shared that his family's 1920s farmhouse in Bedford, New York flooded in 2003 while they were on vacation and became overrun with black mold.[1] Almost all of his children were affected, his wife was badly affected in ways her doctors could not understand, and the house was eventually torn down.[1]



Note: the full HHS roundtable can be viewed here—much of which focused on the major shortcomings existing for invasive mold disease (which is different from the mold illness this article focuses on).

Kennedy's story is by no means unique to his family, and within the integrative medical field, it is extremely common to encounter individuals who have spent years going from doctor to doctor with fatigue, brain fog, pain, chronic sinus issues, perplexing neurological issues and a growing sensitivity to foods, chemicals and medications, only to be told their labs are normal and leave without a diagnosis.

Mold patients hence face the same struggles other patients with complex illnesses have as:

• Many of the symptoms appear so peculiar and inexplicable, physicians will frequently ascribe them to a catch-all condition (e.g., chronic fatigue syndrome) or psychiatric disorders.

• Many other complex disorders medicine struggles with have overlapping symptoms with mold toxicity (leading to the condition being over-diagnosed or under-diagnosed depending on the practitioner)—which is further compounded by the fact mold patients often also have another debilitating complex illness.

• The exact mix of symptoms each patient presents with varies, so even when physicians are aware of the possibility of this disorder, without a large volume of patients that makes the broader pattern visible, it can be challenging for them to spot it without a history that specifically explores this question.

All of this helps to explain why Kennedy's call for more physician education, better diagnostics, and new treatments for mold illness (along with research into why it is so frequently unrecognized) was so significant, as up until now, HHS had only acknowledged mold's effects on the lungs,[1] while patients with the broader illness were told the evidence did not support their condition,[1] and physicians were warned against the tests used to diagnose them.[1]

Mold patients also fall into a group I have long felt medicine fails the most: those who are more sensitive than the average person. Our medical system is built around the statistical average, so when a subset of patients reacts to something the majority tolerates (e.g., a medication, a vaccine or a building), rather than recognizing that sensitivity varies, the system typically concludes the reaction cannot be real (which I discussed further here). In the case of mold, this is compounded by the fact that the people around a mold patient (e.g., their family or coworkers) frequently feel fine in the same building, so the patient is often dismissed by the very people they are relying on for help, and many in turn come to wonder if they are simply losing their minds.

The cultural attitude toward these patients was best illustrated by Netflix's 2018 docuseries Afflicted,[1] which followed seven people with chronic illnesses, including a young woman who had become so sensitive to mold that she lived in a van in the desert to avoid it. Although the participants agreed to the series on the understanding it would compassionately portray their illnesses, it instead presented them as

curiosities whose conditions were likely psychosomatic, prompting more than 40 physicians, scientists and writers to ask Netflix to remove it[1] (while the skeptic establishment gleefully embraced it—with one blog proclaiming it "the tragedy of fake illnesses" and arguing the participants had been driven by the internet and charlatans to believe they had diseases that did not exist).[1] Four of the participants (including her) then sued Netflix for defamation, and remarkably, after a California appellate court found the show could reasonably be understood as falsely implying they were imagining their illnesses,[1] Netflix settled the suit in 2023.[1]

Note: mold-sensitive patients are frequently described as "canaries," after the birds coal miners once brought underground because they succumbed to toxic gases before the miners did. In many cases, these patients are simply the first to notice a problem that is also affecting everyone else in the building to a lesser degree.

Conversely, while mold is a major problem for some (e.g., I know more people than I can count who've experienced debilitating suffering from it), I feel too much fear is presented about it within parts of the integrative medical field, as not everyone is highly sensitive to mold, and in many cases, the extreme measures proposed are not necessary for that individual. For example, I am on the more sensitive end of the spectrum and frequently avoid environmental exposures (which my friends and family often gently tease me about). With mold, I notice I feel a bit worse in moldy buildings or when I sleep near mold (and if more is present, develop sinus issues that persist after the exposure), so I prioritize mitigating or eliminating it whenever that is feasible. However, I can still go into those buildings if I need to (or tolerate prolonged time in a slightly moldy environment), whereas many of the mold patients I know cannot, as they are far more sensitive than I am (e.g., we had to redo the air conditioning vents so the most sensitive ones could tolerate being there).

As such, my goal with this article is to give an accurate picture of what is known about mold, which in this case requires acknowledging that much of it is far less settled than it appears. Each of the leading figures in the mold field has developed their own model, tests and protocol, and while each has helped many patients, they frequently disagree, and since none of the tests for mold illness have been validated against a gold standard, there is currently no way to settle many of these disagreements. As a result,

much of what follows has required integrating perspectives that at first glance contradict one another.

Note: Dr. Ritchie Shoemaker (who has done more than anyone to establish that water-damaged buildings make people sick) and Dr. Neil Nathan, whom Shoemaker trained, both have decades of experience treating mold illness and are two of the most well-known voices in the field, so they are cited in this article. However, as interviews like this recent discussion between them showed, disagreements exist between the two of them in how mold illness should be managed (and likewise, our approach somewhat differs from theirs).

Why Mold Illness is Censored

Unlike most diseases, someone is always at fault for mold illness. Mold only grows indoors when water gets somewhere it should not be, so a builder, landlord, employer, school district or insurer is typically responsible for the conditions that made someone sick. Dr. Ritchie Shoemaker made this point in Mold Warriors, arguing that because there is a flaw, there is liability, and because so many buildings are damp, the amount of money potentially involved is staggering.[1] He in turn described how insurers leaned on official reports stating that mold had not been proven to cause chronic illness to deny the claims of people who had been sickened.

I independently reached the same conclusion, as mold is effectively a "too big to fail" problem. Since such a large portion of our buildings have water damage, acknowledging that they make people sick would expose builders, landlords, insurers and schools to an almost unlimited liability, so much like the institutions that mandated the COVID vaccines cannot admit how many people those vaccines injured, it is far easier to simply insist the illness does not exist and pay enough to ensure that is "the science."

However, much like the vaccine industry has gradually lost its monopoly on "safe and effective" (as increasingly harmful vaccines entered the market and social media made the resulting injuries far harder to suppress), awareness of mold has steadily grown. Unlike vaccine manufacturers, home builders are not shielded from liability by anything like the 1986 National Childhood Vaccine Injury Act, and as a result, a wave of lawsuits against the largest home builders in the country now alleges that

undersized HVAC systems, poorly sealed windows and badly ventilated attics are trapping moisture in new homes.

D.R. Horton, the nation's largest builder, for instance, saw its legal reserves rise 57% between 2022 and 2025 to $1.1 billion, much of it attributed to these suits, while the builders argue the claims rest on inconsistent testing and unreliable assessors.[1,2] In the Louisiana litigation, homes were found to be sitting at 70-80% indoor humidity, and a separate South Carolina settlement involving more than 200 homes reached $16.1 million.[1] The attorney leading the Louisiana case stated he had walked through hundreds of these homes and that there was mold everywhere.[1]

Most people never hear about these disputes because home purchase contracts typically contain arbitration clauses, so the cases are settled confidentially and the pattern of defects never becomes public.[1] Likewise, since physicians are trained to regard most mold claims as unproven, the patients in these homes are rarely given a diagnosis that could support a legal claim—so in effect, the system that would need to acknowledge the problem for anything to change is structured so that it never has to.

Incentives frequently drive outcomes, and the largest homebuilders have little incentive to build homes correctly. An engineer who has inspected thousands of new builds told Hunterbrook Media that there is no bonus for building a home to code or for quality, only for speed and volume, and estimated essentially every new build has multiple code violations.[1] In parallel, the builders told investors they would cut costs (e.g., D.R. Horton planned to replace high-quality fixtures with less expensive ones), a former D.R. Horton superintendent said the company "always used the cheapest subcontractor," and the two largest builders set aside only $2,348 and $3,602 per home for warranty costs, far less than the $5,000 to $20,000 in repairs a typical new home needs.[1] Likewise, their contracts often make buyers forfeit their deposits if they back out (even for mold), exclude mold from their warranties, waive the implied warranty of habitability, and force disputes into confidential arbitration,[1] so the cost of these defects is shifted almost entirely onto the families who move in. Since many of the most common defects (e.g., water intrusion, leaky roofs, inadequate ventilation and improperly sized HVAC systems) are exactly what allows mold to grow, it is not surprising that so many of these homes become moldy within a few years of being sold —as the Louisiana suit illustrates, where homeowners allege D.R. Horton knowingly

installed inadequate ventilation to cut costs (e.g., by omitting return air vents in master bedrooms).[1] Similarly, Lennar is being sued by the Seminole Tribe of Florida over more than 450 homes with improperly installed roofs and mold-ridden walls.[1]

In essence, mirroring the pattern seen with many other predatory industries, the cost of building these homes poorly is pushed onto someone else. Since the defects often take years to surface (frequently after the warranty has expired) and the builder bears almost no liability for them, a builder that saves a small amount on each home will always come out ahead of one that spends a little more to build it correctly, even though the family who buys that home ultimately pays many times what was saved. Sadly, this calculation is nothing new—in 1977, Mother Jones revealed an internal Ford analysis estimating that modifying the fuel tanks on its vehicles would cost $11 per car (roughly $121 million in total), while the 180 burn deaths, 180 serious burn injuries and 2,100 burned vehicles the change would prevent were "worth" only $49.5 million,[1] so Ford continued selling its Pinto without the fix. Much like that $11 part, the fixes for moldy construction cost almost nothing per home, yet as long as paying for the harm remains cheaper than preventing it, there is little reason to expect the industry to change on its own.

Note: the builders argue that many mold problems result from homeowners failing to maintain their homes, and that the testing used to document mold is inconsistent.[1]

In short, we again see the classic industry playbook (e.g., that used for decades with tobacco, asbestos and lead), where rather than admitting that a product or practice is harming people, it is far cheaper to deny the illness exists, fund science that casts doubt on it, and obstruct the research that would prove it. This makes Secretary Kennedy's decision to raise this issue commendable, as taking it on puts him at odds with the real estate and insurance industries (two of the major lobbying forces in Washington),[1] adding them to the many already working around the clock to obstruct and sabotage MAHA's policies.

Note: Kennedy has similarly begun drawing attention to the health effects of electromagnetic fields (e.g., last month, HHS put out a detailed request for the public to submit evidence on EMF exposure and health)—a critically important issue which pits him against an even larger lobby (as many sectors of our economy rely upon EMFs).

The Origin of Moldy Construction

There are three primary reasons mold has become so much more common in our buildings.

First, after the 1973 oil embargo, homes were insulated and sealed far more tightly to save energy, and without adequate ventilation, those homes trap moisture.[1]

Second, we now build almost everything out of cellulose. Standard drywall is a gypsum core wrapped in paper, and **paper is an ideal food for mold** (as one speaker at the HHS roundtable put it, we have put mold food on the back of every wall).[1] Wood framing, plywood, OSB, ceiling tiles and carpet padding all feed mold once they get wet, and lumber is frequently rained on during construction and then enclosed before it has dried.[1] Rain during framing is often unavoidable, and wood that gets wet is not a problem if it is given time to dry, as mold and rot begin once wood stays above roughly 19% moisture. However, verifying this simply requires checking the framing with a moisture meter before the walls are closed, and if it is too wet, holding off on drywall until it dries[1]—a delay that production builders racing to close homes are rarely willing to accept.

Third, mechanical systems are often sized and installed to minimize cost rather than to control humidity. Air conditioners remove moisture from the air as it condenses on their cold coils, but this only happens when they run long enough. A unit that is too large for the home cools it quickly and shuts off before much moisture is removed (leaving it cool but clammy), while one that is too small (a central allegation in the current lawsuits) cannot keep up during hot, humid weather. Likewise, since tightly sealed homes have no natural way to exhaust moisture, they depend upon mechanical ventilation, yet bathroom fans are frequently vented into attics rather than outdoors, and leaky ductwork running through hot attics can pull humid air into the home or cause condensation to form around the ducts—all of which creates a steady supply of water for the mold to grow on.

Sadly, **much of this could have been prevented at very little cost**. Paperless drywall (a gypsum core wrapped in fiberglass instead of paper), for example, removes the food source and costs roughly 10 to 15 cents more per square foot than standard board,[1]

which for a typical basement works out to about $500, a small fraction of what a single mold remediation costs.[1] Similarly, properly sized dehumidification, sealed ductwork, and letting materials dry before they are closed in add very little to the cost of a home, but since the builder rarely pays for the mold that develops later, there is little incentive to do them—and the people who end up paying for it are the families who move in.

Note: Dr. Shoemaker has also argued that benomyl, a fungicide widely used from the 1970s onward and later withdrawn,[1] selected for more resistant and toxic indoor molds, much as antibiotic overuse created resistant bacteria.[1]

Notably, like many other Forgotten Sides of Medicine, the dangers of damp buildings were recognized long before modern medicine. For example, the Roman architect Vitruvius advised that libraries face east because damp winds from the south and west ruin books,[1] and Leviticus gives detailed instructions for inspecting a house with a spreading growth on its walls, removing the affected stones, scraping the interior, and tearing the house down if the growth returned[1] (which remains a reasonable description of correct remediation).

Sick Building Syndrome

Sick building syndrome describes situations where occupants experience symptoms that appear to be linked to time spent in a building but (like complex illnesses) no specific illness or cause can be identified, while "building related illness" describes a diagnosable illness that can be traced to a specific contaminant in a building.[1] One of the hallmarks of sick building syndrome is that most people feel better soon after leaving the building, and in 1984, a World Health Organization committee estimated that up to 30% of new and remodeled buildings worldwide might be the subject of excessive indoor air complaints.[1]

While sick building syndrome has many causes (e.g., chemical off-gassing, inadequate ventilation or combustion products), water damage is one of the most common. For example, in an EPA survey of office buildings, 85% had experienced past water damage, and 45% had active leaks at the time of the survey,[1] while in Europe, 20-30% of households have dampness problems, which the World Health Organization

concluded was a risk to health.[1] That said, a single leak does not necessarily lead to mold if it is addressed promptly, as wet materials that are dried within 24 to 48 hours generally will not grow mold,[1] whereas chronic leaks and persistent humidity are what allow it to take hold.

The effects of mold toxicity conventional medicine acknowledges are primarily respiratory. The WHO, for instance, concluded that damp buildings increase respiratory symptoms, allergies and asthma, and perturb the immune system.[1] Researchers at Lawrence Berkeley National Laboratory likewise found that dampness and mold raised the risk of a variety of respiratory outcomes by 30-50%,[1] and childhood mold exposure has been associated with a 1.4-fold higher risk of developing asthma,[1] while a subsequent EPA analysis estimated that 21% of current asthma cases in the United States (about 4.6 million) were attributable to dampness and mold in the home.[1]

Unfortunately, the part of mold illness that actually upends patients' lives (the multisystem illness Dr. Shoemaker termed chronic inflammatory response syndrome, or CIRS) is still largely regarded as unproven by the conventional literature.

Why Sensitivity Varies

One of the questions I have focused on for a long time is why two people can receive the exact same exposure, and one is devastated by it while the other is completely fine. Mold is one of the clearest examples of this, as it is very common for several people to live in the same damp house and only one of them to become sick, and those who become severely ill are the minority.

The people who react to mold fall into a few broad groups:

• **Allergy:** people who get headaches, congestion, and generally feel lousy around mold.

• **Mycotoxin illness:** people who develop far more severe symptoms, such as being unable to think, widespread body pain, and in some cases psychiatric symptoms.

• **Sensitization:** people whose immune systems (and mast cells in particular) have become so reactive that small exposures trigger severe flares. A few reach the point of reacting to mold the way someone with a peanut allergy reacts to peanuts, but they are relatively uncommon.

• **Colonization:** people in whom mold has taken up residence in the sinuses, gut or lungs, so the exposure continues even after they leave the building.
Note: chronic fungal sinusitis is often misdiagnosed as bacterial, and the antibiotics given for it can then disrupt the existing microbiome that keeps the fungi in check.

These groups overlap, and which one someone belongs to determines what will help them. Someone who is simply exposed often only needs to leave the exposure, while someone who is colonized will not fully recover until the colonization is treated.

As for why only some people become ill, there are two major schools of thought:

Genetics: Dr. Shoemaker first noticed this in 1996, when of ten people who were water skiing in a river during a toxic Pfiesteria bloom, seven became sick and three did not. He later linked susceptibility to specific HLA-DR genotypes, and has consistently found that about 24% of people in a water-damaged building become ill, a figure he attributes to the roughly one quarter of the population carrying susceptible genes.[1]

Immune resilience: Dr. Neil Nathan initially tested HLA-DR on all of his patients but stopped, because he saw no correlation between genotype and how patients responded to treatment, and because being told they carried a "dreaded" genotype frightened patients into believing they could not recover.[1] His view is that a robust immune system can tolerate a moldy environment with minimal illness until something hits the immune system (e.g., COVID, a serious infection, surgery or an emotional upheaval), at which point it loses containment.

Both lead to the same practical conclusion: a damp building is a risk factor, not a sentence, and whether it makes you sick depends heavily on what else your body is dealing with. Likewise, both report that patients with the supposedly worst genotypes still recover.

Note: since the susceptible HLA genotypes are found in roughly a quarter of the population, yet nowhere near a quarter of people have mold illness, many physicians question how much

weight the test deserves.[1]

As such, before deciding they need to move or gut their house, people should figure out where they fall on this spectrum, as for most, the right first step is far less drastic.

Mold Toxicity Research

Mycotoxins (the toxic compounds molds produce to fend off competing organisms) disrupt mitochondria, generate oxidative stress, and can in turn trigger a sustained cell danger response (discussed further below). In parallel, they also appear to create fluid congestion in the body, which (as I discussed in an article on the physiologic importance of physiologic zeta potential) has a variety of significant consequences, including making patients much more sensitive to treatments (as without circulatory and lymphatic support, the body cannot tolerate the shifts therapeutic agents create or effectively drain what is released). Mycotoxins can also damage the gut lining[1] (contributing to intestinal permeability and the food sensitivities so many mold patients develop). Likewise, the immune system responds to the many fungal and bacterial fragments present in damp buildings, which can create chronic inflammation even when no mycotoxins are present. A substantial body of data, in turn, corroborates these effects.

Note: from our own observations, many of the neurological symptoms of mold toxicity appear to arise from impaired venous and lymphatic drainage from the head (something which—as discussed here and here, we also believe underlies many neurodegenerative disorders like Alzheimer's).

Neurologic: Employees of a water-damaged hospital had 6.6 times the risk of nervous system symptoms and 4.9 times the risk of brain fog compared to controls,[1] and neuropsychological testing of mold-exposed patients has found deficits in learning, memory and psychomotor speed falling below the 10th percentile.[1] In mice, inhaled Stachybotrys triggered brain inflammation, impaired memory and increased anxiety-like behavior,[1] and since mycotoxins can cross the blood-brain barrier,[1] some (e.g., gliotoxin) have also been shown to damage myelin[1] (the hallmark of conditions like multiple sclerosis). Similarly, in a large Chinese survey of older adults, musty smells

and mold in the home were associated with a 40% higher risk of cognitive impairment.[1]

Autism: Two studies have found that autistic children had higher levels of mycotoxins in their urine[1] (and serum)[1] than healthy controls (which given the urine test issues discussed below should be interpreted with caution, but nonetheless is quite concerning given the rapid rise in autism).

Autoimmune: In a Finnish study of workers in seven water-damaged buildings, physician-diagnosed autoimmune diseases were 8-10 times more common than in the general population.[1] A 20-year follow-up of students and teachers from a water-damaged Finnish school found that over a third had developed an autoimmune condition, roughly four times the national rate.[1] Likewise, mold-exposed patients have been found to have autoantibodies against myelin, nerves and smooth muscle,[1] and in one study of autoimmune inner ear disease, patients had high levels of anti-mold antibodies that appeared to cross-react with a protein in the inner ear.[1]

Fatigue: A NIOSH study comparing employees of a heavily water-damaged school in New Orleans with a minimally damaged school in Cincinnati found significantly more fatigue in the damaged school,[1] and in one study, 93% of 112 chronic fatigue syndrome patients had mycotoxins in their urine.[1] Similarly, one integrative clinic found that 21% of its mold-exposed patients had fibromyalgia, compared to 3.8% of its general patients.[1]

Mood: A study of 5,882 adults across eight European cities found that those living in damp or moldy homes had a 34-44% higher risk of depression,[1] while a study of 9,243 older adults in China found that mold exposure more than doubled their odds of depression.[1] Psychiatrists familiar with mold have also reported cases of severe depression and psychosis to me that did not respond to standard medications and were associated with water-damaged buildings—which is particularly concerning given how many of these patients are simply placed on psychiatric medications and never asked about their homes.

Note: since damp housing frequently goes hand in hand with poverty and stress, that could have potentially confounded the above results. However, I doubt this explains the above data

as the findings are consistent across countries and study designs, and many patients' symptoms resolve once they leave a damp building.

Recognizing Mold Illness

Most physicians receive almost no training on this (e.g., a soon-to-graduate medical resident recently shared with me that his entire medical education on water-damaged buildings was a single slide in a fungal pathogens lecture, which (like many critical medical concepts) the lecturer spent about thirty seconds on). As a result, patients with mold illness typically go through years of normal lab results before anyone thinks to ask about their home.

Since there is no widely available reliable test, the diagnosis of mold illness is often made by history. The features that most commonly point toward it include:

• Fatigue (particularly an exaggerated crash after exertion), brain fog and poor sleep that began after moving into a building, a leak or renovation work.

• Symptoms that improve substantially when away from home (e.g., on vacation) and return shortly after coming back.

• A musty smell, visible mold or a known history of water damage.

• Symptoms in many organ systems at once (e.g., headaches, body pain, frequent urination, light and sound sensitivity, digestive problems, food sensitivities, persistent dark circles under the eyes, and anxiety or irritability).

• Increasing sensitivity to smells, chemicals and medications.

• Mood changes that are out of character for the person (e.g., anxiety, rumination, paranoia, disproportionate anger, indecisiveness, obsessive tendencies or social withdrawal).

Note: mold illness also frequently causes symptoms that rarely appear together outside of it, such as constant thirst with frequent urination (often mistaken for a bladder infection),[1] static shocks, stabbing "ice-pick" pains and headaches, night sweats and difficulty regulating body

temperature, numbness and tingling that does not follow nerve pathways, vertigo, a metallic taste, light sensitivity, red or tearing eyes, blurred vision that comes and goes, morning stiffness, difficulty finding words,[1,2] ringing in the ears, tremors and muscle twitches, intense sugar cravings, and symptoms that worsen on rainy days or with changes in barometric pressure.

The simplest diagnostic test is to leave, as people with mold illness who spend a few days somewhere relatively mold-free will often feel noticeably better. Cars should not be overlooked either, as air conditioning systems in cars whose filters are never changed (or that have small leaks) frequently become moldy, and the same is true of workplaces.

Note: once the illness has become established, leaving alone is often not enough. In one of Dr. Shoemaker's studies, for instance, the participants reported that time away from their buildings (e.g., on vacation) had produced little or no relief prior to treatment.[1]

Other causes also need to be considered, as many of the symptoms on the mold checklists are nonspecific. Babesia and Bartonella (tick-borne infections commonly found alongside Lyme) in particular can produce the same waxing and waning symptoms, and mold, Lyme with its co-infections, long COVID and COVID vaccine injuries frequently produce similar pictures. Likewise, the additional stress created by COVID spike protein toxicity (either from an infection or vaccine) "unmasked" mold illness in many people who had been tolerating a damp environment, so a decline that began after COVID does not rule out a building as the underlying cause.

In time, these patients gradually realize they increasingly react to moldy buildings—which can result in being ill for days afterwards. Dr. Shoemaker, for example, termed this "sicker, quicker,"[1] and repeatedly found that visiting a moldy building would cause recovered patients to have their symptoms return,[1] while another doctor found roughly half of the thousand people he treated eventually developed sensitivities to perfumes, cleaning products, exhaust and other common chemicals, and that many developed such a heightened sense of smell that they could detect mold on another person's clothing.[1]

Mold Illness and the Cell Danger Response

One of the most perplexing things about mold illness is how much more sensitive patients become over time. Someone who initially just felt a bit off in their home can, a few years later, be unable to walk into a store without being knocked out for days, while also reacting to perfumes, foods and supplements they used to tolerate without any issue. Since this makes little sense within the conventional model of disease (where a fixed dose of a toxin should produce a fixed effect), it is a major reason these patients are dismissed as simply having anxiety (or something similar).

In my eyes, the best framework for understanding this is the cell danger response (CDR), which I recently discussed in a three-part series. To briefly summarize, when cells sense a threat, their mitochondria shift from powering the cell to defending it, the cell partially "turns off," and it signals the cells around it (and ultimately the nervous system) that danger is present. In health, the cell then goes through a healing cycle and returns to normal once the body signals it is safe, but in chronic illness, cells get stuck in the CDR and stop functioning as they should.

This is why a persistent CDR is thought to underlie many complex illnesses such as chronic fatigue syndrome (whose metabolic profile Naviaux found resembles a hypometabolic survival state),[1] and why many of the conditions that trigger the CDR (e.g., viral infections, Lyme disease and mold toxicity) are also commonly linked to chronic fatigue syndrome.

Naviaux's original description of the CDR, in turn, lists fungi among its microbial triggers and notes that chemical threats (e.g., toxins) can also activate it,[1] and mold exposure frequently delivers both at once. As a result, many of the physicians who treat mold illness now consider a persistent CDR to be one of the main reasons patients remain ill, and much of what makes mold patients so challenging to treat makes sense once you view it through this lens:

• Each activation of the CDR makes the next one easier to trigger, as the CDR effectively learns from each threat it encounters and becomes progressively easier to trap the body in (which is exactly what "sicker, quicker" describes).

• In the hypometabolic survival state many chronic CDR patients enter, behavioral responses become "brittle," so small stimuli produce disproportionately large reactions[1]—mirroring the mold patient who reacts severely to an exposure no one else around them notices.

• The ATP cells release to signal danger is one of the primary regulators of mast cell degranulation,[1] and blocking that signal inhibits it,[1] which helps to explain why so many mold patients develop a mast cell activation disorder that makes them react to everything.

• A CDR can persist long after its trigger is gone. In one study, for example, the CDR an HHV-6 infection triggered persisted even once the virus was almost undetectable, and serum from chronic fatigue patients could induce the CDR in healthy cells.[1] This is likely a key reason why many mold patients do not recover simply by leaving the building (particularly if mold colonization keeps signaling that a danger is still present).

• The CDR is terminated by safety signals from the body (e.g., via the vagus nerve and restorative sleep), but an active CDR disrupts sleep and keeps the nervous system in a sympathetic "fight or flight" state, so the body never receives the signal that it is safe to exit—which I believe is why the limbic and vagal dysfunction so many clinicians observe in mold patients is so central to their illness.

• Since fluid stagnation is itself a trigger for the CDR (and the two reinforce one another), mold's effects on zeta potential create yet another way for the CDR to become entrenched.

Likewise, the CDR model also accounts for why some people become ill in a damp building while others do not. In many complex illnesses, patients pass a threshold where the collective weight of their stressors flips the CDR to being chronically activated, which fits closely with the observation that many mold patients tolerated their environment until something else hit their system (e.g., COVID, a surgery or a major emotional loss). Similarly, I find the mold-sensitive patients I encounter frequently have a more extensive history of past trauma and illness.

Note: this also explains why so many mold patients react to supplements and therapies that "should" help them, as attempting to increase the output of mitochondria that have deliberately reduced it to protect the cell (while the danger is still present) frequently makes patients feel worse. Likewise, as mentioned before, I have found that the fluid stagnation frequently accompanying these diseases (e.g., mold, Lyme and spikeopathy), once resolved, allows patients to tolerate closer to normal therapeutic doses, which I attribute to a restoration of lymphatic drainage.

Most importantly, this framework explains why mold illness, despite how frightening it can be, is so often reversible. The CDR is a protective response rather than permanent damage, and once the danger is removed and the body receives enough signals that it is safe, the cells can complete their healing cycle—at which point they are frequently healthier than they were before the CDR began.

Ritchie Shoemaker's Discovery

Dr. Ritchie Shoemaker, a family physician in Pocomoke, Maryland, began working on mold illness at a time when almost no one else did, and most practitioners in the field today either trained under him or under someone who did.

His work began with the Pfiesteria outbreaks in the Chesapeake Bay in the late 1990s, where a dinoflagellate toxin caused fish kills and a chronic illness in many local residents. He found that a drug that binds bile in the gut cleared this mysterious illness, and later noticed that patients sick from water-damaged buildings had the same symptoms, the same lab abnormalities and the same response to treatment.[1] In turn, wanting to see for himself what his patients were describing, he visited many of the homes and workplaces they told him had made them sick—and as a result of these repeated exposures, he eventually became sensitized himself, to the point that almost any exposure to a water-damaged building now causes him to bleed.[1]

In his model, the illness is fundamentally inflammatory rather than infectious. Fragments from fungi, bacteria and their toxins trigger the innate immune system, and in susceptible people, that inflammation never turns off. Over the years, he documented a series of lab abnormalities typically present together in these patients:[1]

• Low MSH (melanocyte stimulating hormone), a hormone that regulates inflammation, sleep, pain and the gut lining.

• Elevated MMP-9, C4a and TGF-β1, all markers of innate immune activation.

• Low VIP (vasoactive intestinal peptide) and abnormal VEGF.

• Low ADH (antidiuretic hormone) with high serum osmolality, which explains why so many patients urinate frequently and are constantly thirsty.

• Abnormal leptin, which contributes to the weight gain many patients experience.

• MARCoNS, a multiple-antibiotic-resistant staph that colonizes the deep nasal passages and which he believes further suppresses MSH.

Shoemaker also developed a visual contrast sensitivity test[1] (an inexpensive screening test for subtle neurologic impairment), used NeuroQuant MRI to document patterns of brain swelling and atrophy, and more recently has used gene expression testing to distinguish illness caused by fungi from illness caused by actinomycetes and endotoxins (bacterial products that also accumulate in damp buildings).

These markers are extremely useful for showing a patient (and their physician) that something real is wrong, **but they are nonspecific** (e.g., the same abnormalities frequently appear in Lyme, Bartonella and other infections).

Testing the Building

Dr. Shoemaker's most widely accepted contribution is how to test a building. Conventional mold inspections rely on air samples, which typically capture five to ten minutes of air from the middle of a room and miss the spores and fragments that settle along its edges (in one of his books, he noted that a landlord trying to hide a mold problem would use a single short air sample taken mid-room with the windows open).

Instead, he relies on ERMI, which measures the DNA of 36 mold species in settled dust,[1] and HERTSMI-2, a simpler score built from the five species he found most predictive of illness. In general, he considers an ERMI above 2 or a HERTSMI-2 above

10 elevated, and treats HERTSMI-2 as the better guide for whether a sick person can safely reoccupy a cleaned building. Dr. Nathan agrees, and both consider air sampling close to useless for this purpose.[1] Since many licensed mold inspectors have as little as ten hours of training, it is worth finding one who understands mold-sensitive patients. Likewise, who commissions the testing matters. In one suit against Lennar, for example, an assessment the homeowner commissioned deemed the home uninhabitable, with mold levels as high as 2.2 million spores per cubic meter, whereas an assessment Lennar had commissioned days earlier recorded about 500.[1]

Note: dust-based tests are inexpensive and can be done by the homeowner (e.g., with a Swiffer cloth), so they are the most cost-effective first step for anyone who suspects their home.

Existing Protocols

Shoemaker's treatment is a 12-step sequence that begins with removal from exposure, followed by a binder to remove toxins in the gut, eradicating MARCoNS, removing gluten if antigliadin antibodies are present, and then correcting each of the hormonal and immune abnormalities in turn, finishing with VIP nasal spray.

The protocol works, and Dr. Shoemaker estimates that about 95% of his patients recover to the point of being functional.[1] However, it has three significant drawbacks:

• It is expensive. Most of the testing is not covered by insurance, and a course of 20 doses of VIP costs roughly $10,000.

• It is demanding. It requires strict avoidance of any building that fails testing, and many patients cannot tolerate full doses of the binders (which are unpleasant and constipating).

• It is hard to access, as there are relatively few certified practitioners and most do not accept insurance.

As such, while it is an excellent option for those who can complete it, many patients either cannot, or are better served by a simpler approach.

Dr. Nathan, in contrast, now takes a substantially different approach. He uses urine mycotoxin tests to identify which toxins are present and selects binders specific to each, believes most of his patients are colonized with mold and will not recover without antifungals, and finds that most also have some degree of limbic, vagal or mast cell dysfunction that must be addressed before they can tolerate treatment. Conversely, Dr. Shoemaker believes only a small minority of cases are now caused by fungi (with actinomycetes and endotoxins accounting for most of the rest), opposes antifungals, and does not consider urine mycotoxin tests valid. Since patients choose physicians whose approach appeals to them, the two may well be seeing very different populations—as we have seen mold patients who fit into each of these approaches (along with others where neither approach was appropriate).

Note: one of the most common problems in medicine is that physicians will have a specific therapeutic box ("if you have a hammer everything looks like a nail"), and incorrectly superimpose that box onto patients where it is not correct for the case at hand, as what they saw help one person could very well not help the next (especially when done excessively).

Finally, other popular protocols only focus on fighting the mold once everything else has been done first to ensure the body can tolerate the treatment without getting worse.

The Problems With Testing the Body

One of the primary hypotheses in the field is that the mycotoxins molds release are what cause mold illness, and as a result, many protocols are built around testing for them. Others, however (most notably Dr. Shoemaker), believe the illness is instead an inflammatory response to the many different microbial products found in damp buildings, and since no level of urinary mycotoxins has ever been shown to predict disease, the urine mycotoxin test has become one of the most contentious issues in the field.

Advocates point to studies like the one above where over 90% of chronic fatigue patients tested positive for urinary mycotoxins. Critics point out that mycotoxins are common in food, so they are routinely found in the urine of healthy people, and that

no level has ever been established that predicts disease. In 2015, for example, the CDC reported on an employee who ordered a direct-to-consumer urine test after searching her symptoms online, was diagnosed with mold toxicity and prescribed an antifungal despite no sign of mold in her office, after which her coworkers began attributing their own nonspecific symptoms to mold.[1] Those who use the test heavily acknowledge it was never properly validated, but find it clinically invaluable, and in one small pilot study, seven of eight mold patients had lower mycotoxin levels after ten days of eating foods typically considered moldy than after ten days of avoiding them, which argues against food being the main source in sick patients.[1]

In my eyes, the issue is not that the test is inaccurate, as the labs (which use mass spectrometry) are accurately measuring what is in the urine. Rather, it is that no one has paid (what would be a significant amount) to determine what those numbers mean clinically. Repeating the test on five consecutive days, for instance, will often produce five significantly different results, much of which reflects diet, and some people with very high levels feel fine. Some practitioners also have patients take glutathione or NAC beforehand to increase the amount excreted, which further complicates interpreting the results. As such, we feel results should only be given weight when they are around ten times the upper limit of normal in someone who is clearly symptomatic. A mildly elevated result means very little, and treating it as a diagnosis is one of the main ways mold gets overdiagnosed.
Note: a major problem with many of the non-standard tests used in integrative medicine is that they have been validated in relatively small populations, so it remains an open question exactly what their results mean. Pierre Kory, for example, has shared with me that his practice (which frequently treats COVID vaccine injuries and long COVID) discovered numerous tests used for evaluating spike protein pathologies had minimal clinical value, so they stopped using them.

Blood tests for mycotoxin antibodies have similar problems, but can still be useful (e.g., we've observed results tend to fall once patients leave the exposure and take an antifungal for a few months, and a high IgE suggests ongoing environmental exposure, while a high IgG suggests the problem is within the body). Dr. Shoemaker, however, argues these tests cannot be valid at all, because mycotoxins are too small to provoke an antibody response on their own.

As such, any of these tests should be treated as one piece of the picture, with the diagnosis resting primarily on history, dust testing of the building, and how the person responds to leaving it.

Note: I have repeatedly found that the most clinically successful integrative physicians tend to order the fewest tests, as they rely far more on patient history, response to treatment and what they perceive in the patient in front of them (e.g., from a comprehensive physical exam—which sadly is becoming a lost art in medicine).

Mold Remediation Pitfalls

Since people understandably wish to avoid needing to vacate their living space, many instead attempt to remediate their homes. Unfortunately, most people who try to remediate their homes fail, and as a result, many spend tens of thousands of dollars on a home they still cannot live in. Surviving Mold, for instance, has a chapter on what can go wrong with remediation, which answers its own question with a single word: everything.[1]

The usual reason is **that the repair spreads the problem**. A kitchen or bathroom leak is fixed and the moldy section is cut out, but in the process mold and mycotoxins are dispersed throughout the house, and no one cleans them up. Mycotoxins are microscopic and lodge in every crevice of painted surfaces, so unless the walls and ceilings are actually wiped down, the house remains contaminated. Likewise, the people doing the work often have no idea how sensitive their client is, so a job that would be perfectly adequate for most occupants leaves the person who actually needed it just as sick as before.

Fortunately, most people do not have to move or tear their house down, as remediation can work when it is done in the right order.

Mold-Free Housing

One of the most common obstacles in treating mold illness is that patients cannot find somewhere safe to live. Searching for housing while exhausted and foggy is grueling,

every showing is a potential exposure, and testing each prospective home quickly becomes expensive, so many patients spend months or years stuck—which is particularly unfortunate, as for many of them, finding a clean place to live is the single most important thing that can be done for their recovery, yet housing of any type is increasingly expensive and difficult to procure.

A few general principles help to narrow down the options:

• Basements, homes in low-lying areas that flood, and buildings with a known history of leaks are the most likely to be problematic.

• Damp climates make mold far more common, whether from heat and humidity (e.g., the Gulf Coast and the Southeast) or from persistent fog and rain (e.g., San Francisco and Seattle), particularly in older housing (e.g., in many Northeastern cities), although the condition of the specific building ultimately matters more than the region.

• New construction is not necessarily safer, as many of the current lawsuits involve homes that are only a few years old.

• Asking the landlord or seller directly about past water damage (and noting any musty smell, staining, fresh paint over isolated patches or dehumidifiers running in a basement) can rule out many homes before testing is needed.

• Dust testing a home before signing a lease or closing on a purchase is far cheaper than discovering a problem afterwards.

• Since furniture, mattresses and other porous belongings can carry mold from a previous home, many patients find they need to leave some of them behind (or clean them thoroughly) when they move.

In the second half of this article, I will cover how to remediate a home in the order that actually works and discuss commonly used remediation approaches (e.g., ozone) along with highlighting some of the rarely discussed mold treatment approaches we have found to be quite helpful for economically addressing each facet of this complex illness (e.g., mold colonization and sensitization).

Proper Mold Remediation

Since the way remediation is typically done so often fails, it is important to understand both the order it needs to be done in and the specific points where it tends to go wrong.

1. Stop the water. Nothing else matters if moisture keeps entering the building, so the first step is always to find out where the water is coming from (e.g., a roof leak, plumbing, a foundation that lets in groundwater, a crawlspace, condensation around ductwork, or an air conditioner's drain pan) and fix it. Indoor humidity should then be kept between 30 and 50%,[1] which in many homes requires a dehumidifier (or dehumidifiers).

2. Separate the testing from the remediation. Since a company that is paid to remediate a home has an incentive to find (or not find) whatever produces the most business, the person assessing the building should ideally be independent of the person fixing it—and as the Lennar case above illustrates, who commissions the testing can completely change the result.

3. Cut out what is contaminated. Moldy drywall, insulation, carpet padding and similar porous materials need to be removed rather than sprayed, as spraying them kills some of the surface mold but leaves the rest (and its toxins) in place. This must be done under containment (e.g., sealing the area off with plastic sheeting and keeping it under negative air pressure so debris is pulled out of the house rather than into the rest of it), which is the step most frequently skipped and the primary reason repairs spread contamination.

4. Clean everything. Once the source is removed, the walls, ceilings, floors and other hard surfaces throughout the house need to be HEPA vacuumed and wiped down, and HEPA air filtration should run throughout the process. Most hard belongings can be cleaned the same way, and many fabrics can be washed, although carpets, rugs and heavily upholstered items usually need to go.

5. Address the HVAC system. Mold within ductwork, air handlers and drip pans gets circulated throughout the house every time the system runs, so it needs to be inspected (and cleaned or replaced if contaminated) as part of any remediation. Likewise, the cabin air filter in cars should be replaced, as it is frequently overlooked.

6. Start small. Rather than gutting the house, it is often better to clean the problem area, the air and the surfaces, and then see whether symptoms improve before doing anything more drastic. Many people find this is all they needed, and since much more extensive remediation is expensive and itself carries a risk of spreading contamination, it should be reserved for when it is actually necessary.

7. Retest. A HERTSMI-2 test after cleaning is the most objective indication of whether a sensitive person can return.

Since many remediation companies are not used to working with sensitive patients, it is worth confirming beforehand that they will set up proper containment and that the sensitive person will not be in the home while the work is done (ideally staying elsewhere until the post-remediation testing comes back).

Air purifiers can also help, particularly for sensitive patients, although which type works best varies from person to person (e.g., some do better with HEPA filters while others benefit more from technologies that break down airborne toxins). That said, purifiers that produce ozone should be avoided, and no purifier will help much if the source of the mold has not been dealt with.

For those seeking help, the International Society for Environmentally Acquired Illness (ISEAI) maintains a directory of both physicians who treat mold illness and indoor environmental professionals familiar with mold-sensitive patients, while those wishing to pursue Shoemaker's protocol can find a practitioner through his certified practitioner list. Since many professionals with general indoor air certifications have little experience with sensitive patients, it is worth asking any inspector or remediator directly how many mold-sensitive clients they have worked with before hiring them.

Ozone and Chlorine Dioxide

Once the water has been stopped and the contaminated material removed, many people treat the building with an oxidizing gas to eliminate whatever mold remains.

Ozone is the most commonly used, and while I was initially a fan of it for this purpose, we eventually found it only works temporarily. Beyond not addressing the water that allowed the mold to grow, it frequently fails to penetrate porous materials, so the mold

within them survives. Additionally, it reacts with many other things in the house (e.g., rubber, plastics, and the terpenes found in cleaning products, air fresheners and some woods) creating chemicals that sensitive patients can react to even after the room has been aired out.

Note: no one should be in a room while it is being treated with significant concentrations of ozone, as the lungs are the tissue in the body most sensitive to ozone toxicity.

After Hurricane Katrina (due to the need to remediate flooded homes), I learned of a compelling alternative—chlorine dioxide vapor (what comes off of CDS). While ozone reacts with essentially anything that can be oxidized, chlorine dioxide reacts mainly with sulfur compounds, amines and a few other highly reactive organic compounds, and unlike ozone, it does not generate large amounts of aldehydes and ketones when it reacts with organic material.[1] Because of this, it is able to penetrate much deeper into materials (whereas ozone does not due to it reacting near the surface).

Furthermore, while ozone is highly toxic to molds, chlorine dioxide also appears to be more lethal to microorganisms in gas form. In a study comparing the two gases against bacterial spores, chlorine dioxide was at least ten times more effective than ozone under similar conditions,[1] and against mold specifically, 24 hours of chlorine dioxide gas completely inactivated Stachybotrys, Penicillium and Cladosporium colonies along with 89% of Chaetomium colonies.[1] Likewise, an EPA laboratory study found a 99.99% reduction in viable Alternaria, Aspergillus versicolor and Stachybotrys on building materials, along with partial inactivation of mycotoxins and allergens.[1]
Note: after Hurricane Katrina, chlorine dioxide fumigation was offered as an alternative way to remediate flooded homes (which led the EPA to partner with the company providing it to test its efficacy).[1]

However, killing mold does not remove it, and in the study above, the Stachybotrys remained toxic after it had been inactivated.[1] Similarly, a field study found that fumigation did not change airborne endotoxin or beta-glucan levels,[1] and the spore study found that inactivation was impractical below 70% humidity.[1] At fumigation concentrations, chlorine dioxide is also corrosive and toxic to breathe, so the building needs to be vacated while it is used, and the vapor that comes off of CDS in a home is far less concentrated than what was used in these studies.

As such, both gases belong at the end of a remediation (after the water has been stopped and the contaminated material removed and cleaned) rather than in place of it, which unfortunately is how they are often marketed.

Treating Mold Illness

No treatment works while someone continues to live, work or drive in a contaminated environment, so getting out of the exposure comes first. If someone has the resources to leave, that is the best option, and if not, the steps above are the next best one.

Beyond that, no single protocol works for everyone, which is why so many exist (and why so many patients bounce between them). For those who wish to pursue Shoemaker's protocol, a certified practitioner network exists,[1] while another widely read approach orders treatment into five steps (avoidance, fundamentals such as sleep, diet and bowel movements, protection, repair, and only then fighting the mold) on the basis that starting antifungals before the body is prepared makes patients worse.

Many of the challenges these protocols face make much more sense when viewed through the lens of the CDR, as in patients with an active CDR who are also dealing with an active danger (e.g., colonization), the order of treatment becomes critical. Typically, one of the following is needed:

• Treating the CDR (if the danger is long gone).

• Treating the active danger and then the CDR.

• Treating the CDR, then the active danger, and then the CDR again (since in many patients, the CDR is so active that targeting the pathogen first triggers a severe flare).

Additionally, in many mold patients, detoxification first requires a much gentler preparatory phase (which a colleague termed "pretox"), and the existing fluid circulation must be improved (e.g., by restoring zeta potential or lymphatic drainage techniques done by an experienced practitioner) so that the toxins being mobilized can actually drain from the body rather than concentrating somewhere else. As mentioned before, I believe this is a major reason why so many mold patients have severe reactions to treatments that should help them, and why giving too strong a therapy for

where the body currently is (rather than the "best" therapy) so often sets these patients back.

Note: we have seen numerous cases where one approach for restoring zeta potential (low dose aluminum-free EDTA) has been very helpful for mold illness.

Oxidative Therapies

When certain oxidizing agents are given at low doses the body can tolerate, they provide a wide range of benefits, which is why many characterize them as umbrella therapies (e.g., I recently discussed chlorine dioxide here). The three most commonly used are hydrogen peroxide, chlorine dioxide and ozone, of which ozone has by far the most supporting scientific literature (which is why it has taken me over six months to compile it).

Ever since I first became aware of mold illness (along with fungal infections like candida), I have encountered people who significantly improved with an oxidative therapy (e.g., a prolonged course of drinking extremely dilute food-grade hydrogen peroxide), which I initially attributed to fungi being highly sensitive to oxidizing disinfectants. Later, I came across numerous people who significantly improved with ozone (typically through home insufflation or intravenous ozone autohemotherapy at a clinic, which an increasing number of practitioners have come to endorse), and most recently, with oral CDS regimens.

These therapies in turn provide one of the most economical options for improving mold illness, although like many things, they work in some cases but not all. Of them, I am the most familiar with ozone and hence most confident in it, but the smaller number of cases I've seen with CDS have been extremely encouraging, particularly since it is the cheapest and easiest of the three to use. Regardless of which is used, however, it is critical not to overdo the dose, especially if there are existing fluid circulation issues that have not been resolved (although oxidative therapies can often improve circulation as well).

Lastly, several other therapies are commonly classified as oxidative therapies, such as UVBI, IV vitamin C (which at high doses catalyzes the body's production of hydrogen peroxide) and hyperbaric oxygen (which, while not directly oxidative, hyperoxygenates the body). While I do not have firsthand knowledge of these being used for mold

illness, in one small study, ten sessions of hyperbaric oxygen improved attention span and reaction time in mold-exposed patients.[1]

The Binder Debate

A widely held view within the mold illness field is that many mycotoxins are excreted by the liver into bile, only to be reabsorbed by the intestines and returned to the circulation, which allows them to persist in the body long after the exposure has ended (which has been best demonstrated with ochratoxin A[1,2]). For this reason, mold illness is frequently treated with binders, which trap these toxins in the gut so they are excreted in the feces rather than reabsorbed.

The central treatment debate in the field, in turn, is whether to start with binders or with antifungals (which kill the mold). Binders such as cholestyramine, Welchol, charcoal, clay and chlorella work very well for some patients, while others take them for six months without benefit (and constipation is a common side effect). Conversely, some patients flare badly when antifungals are started without binders.

One way to resolve this is to start with a tiny dose of a gentle antifungal (e.g., nystatin or undecylenic acid, a derivative of castor oil) and observe the response. If the patient flares badly, they likely need binders first, whereas if they do not, they have been spared months of binders that may not have helped. Either way, treatment needs to be gentle, as aggressive treatment is one of the most common ways these patients are hurt.

Note: Dr. Shoemaker has largely shifted from cholestyramine to Welchol (which is better tolerated), while Dr. Nathan selects different binders depending on which mycotoxins a patient's urine test shows and recommends many patients continue taking light doses of binders after they recover to help their liver handle the toxins we are all now exposed to.[1]

Lastly, in many cases, phosphatidylcholine also helps the body detoxify mold (which requires working with an integrative practitioner familiar with the modality).

Supportive Therapies

Many other approaches are also commonly used to support recovery. These include saunas (as many toxins are excreted through sweat), which can be quite helpful but

need to be approached cautiously by those with heart conditions, those who are pregnant, and highly sensitive patients (who often need to start with very short sessions); anti-inflammatory elimination diets (e.g., removing gluten, which Shoemaker found many patients need to avoid, and foods prone to mycotoxin contamination such as dried fruit, aged cheese and some grains); and low dose naltrexone, which many practitioners use to reduce inflammation.[1] Antioxidants like glutathione are also widely recommended, although Shoemaker reported that he saw no change in his patients' inflammatory markers after using them.

Fungal Colonization

Patients whose history suggests the mold has colonized them (e.g., recurring sinus problems or gut symptoms that persist after leaving the exposure) often need the colonization cleared, and once it is, they typically become less reactive to mold in their environment.

Nystatin (which is poorly absorbed, so it acts locally in the gut or sinuses) is commonly used to treat mold illness, but many molds are resistant to it. Oral antifungals are used next (which can also be nebulized). Frequently, fluconazole is favored due to being the cheapest and most widely available, but we prefer itraconazole (Sporanox).
Note: one advantage Sporanox has over fluconazole is that it is not fluorinated (as some individuals have difficulty tolerating fluorinated medications). That said, it does carry an FDA boxed warning for heart failure and for dangerous interactions with many other drugs,[1] so it needs to be prescribed by someone familiar with it.

Alternately, oxidative therapies and sinus rinses (which I discussed here) can provide an economical and effective way to relieve or eliminate these infections (although if they are deep enough, oral antifungals are also needed). In the case of the sinuses, this is most commonly done by adding hydrogen peroxide or CDS to the neti pot mixture (being careful to stay below a concentration that is irritating—so ideally a very low concentration is started with and built up from). Finally, as the sinus article emphasized, an electric pulsating sinus irrigator works better, and adding xylitol often improves results (particularly when seeking to clear your head out after a mold exposure or to remove what is present within the sinuses).
Note: baking soda is commonly used in sinus irrigations when fungal colonization is present.

This approach has significantly more documented support than the oxidative approaches, and in practice tends to be less potent (but still helpful) and simultaneously less irritating.

Finally, one approach utilized within the ozone field to treat sinus fungal infections is to inject a syringe of ozone gas into the sinuses, hold it in, and then expel it (which can be fairly irritating). This approach has worked, but ideally should be done under a familiar practitioner (as numerous mistakes can be made with it), and I believe should be followed by properly flushing out the sinuses with a xylitol containing mixture.

Note: given the previously discussed data on chlorine dioxide gas, it could also be a viable option for sinus colonization. I am not aware of anyone injecting it into the sinuses the way ozone is used (or how viable it is to do). However, a patent filed by one of the pioneers of topical chlorine dioxide reported success treating chronic sinusitis (including allergic fungal sinusitis) with low concentrations of it delivered by nasal spray, steam vaporizer or neti pot,[1] and many have since reported benefit from nebulizing dilute CDS.[1]

In regards to bowel colonization (of either a mold or candida), oral courses of hydrogen peroxide, chlorine dioxide and ozonated water (the mildest of the three) have been reported to improve the illness—which I suspect is at least partly due to them reducing or eliminating fungal colonization in the gut. Additionally, many of the oral agents (e.g., these or itraconazole) have a greater effect on the small intestine (which they encounter first) than the colon, so in cases where significant colonization is present in the colon, rectal ozone can be helpful, and in some protocols, the two are hence combined.

Mold Hypersensitivity

For patients who have become hypersensitized, a few options exist. Generally, we find the best (and most reliable) option is to leave the moldy environment and eliminate any internal fungal colonization. After that, low dose immunotherapy (LDI) occasionally works but often does not, likely because the sickest patients are typically reacting to mycotoxins rather than to the mold itself. As such, LDI is best tried after the exposure has been removed and any colonization cleared.

Since mast cell activation frequently drives these reactions, mast cell stabilizers and limbic retraining programs (such as DNRS, the Gupta program or the Safe and Sound

Protocol) can also help someone who is in a clean environment and still reacting to everything.[1] Within the CDR model, these work because they send the safety signals the body needs to exit the CDR, and likewise, restoring deep sleep, time in nature, social connection and a less stressful life (what Naviaux terms salugenesis) are often essential parts of recovery rather than optional extras.

Note: it typically takes about three months for a new pattern to solidify within the body, and during that fragile period after an initial recovery, the CDR can be very easily reactivated. For this reason, avoiding re-exposure (and excessive stress) during the first few months of recovery is particularly important for mold patients.

Additionally, there are a variety of other options that sometimes work for mold sensitization, but they are so patient-dependent that I hesitate to recommend any specific ones.

Lastly, many patients with mold illness also have Lyme or its co-infections, and in those cases, the mold usually needs to be addressed first, as it upregulates the mast cells to such a degree that patients flare severely when the Lyme is treated. Once the mold is cleared, the response to Lyme treatment is typically far better.

Recovery

Despite their disagreements, the leading physicians in the field all report that the vast majority of their patients recover, and many are followed for years afterwards without relapsing, even when they stay in hotels and other buildings that are less than ideal.[1] Many who went through limbic and vagal retraining also found they were healthier after recovering than they had been before they became ill—which is precisely what would be expected once the CDR's healing cycle is allowed to complete.

This is ultimately the most important thing for readers to take away, as one of the cruelest parts of mold illness is how hopeless it can feel—patients are sick in ways no one around them can see, frequently disbelieved, and then confronted with a body of literature suggesting they may never be well again. In reality, most homes (at least those built prior to this new wave of cheap construction) can be fixed, most belongings can be cleaned, and most people who become ill from mold get better, so if you suspect

your home is affecting you, the first step is simply to find out whether it is (e.g., by testing the dust and seeing how you feel away from it).

Note: Andrew, a longtime reader who became seriously ill from mold in college and medical school and has since presented on mold illness at psychiatry conferences, assisted in writing this article. He is now finishing his psychiatry residency and focuses on helping people with mold illness, primarily by helping them find safe housing through his service (Home Harmony).

Conclusion

Many of the patients I have been the most drawn to are those the medical system gave up on because their condition (e.g., mold illness) did not fit into any of the boxes it recognized. More than anything else, I wish we would stop ignoring them, as again and again, they turn out to be the canaries of a much larger problem we all suffer from. The push to build homes as quickly and cheaply as possible (while leaving those who live in them to absorb the consequences) mirrors what has happened throughout our economy, and I suspect a great deal of the chronic illness that is never traced back to its source will eventually be recognized as a product of the environments we now spend our lives in—which is exactly where our society should be devoting its resources if we wish to make the country healthy again.

That said, I find it remarkable that mold toxicity is at last being discussed openly, as I had always assumed the economics at play would prevent that from ever happening. Much like other environmental toxins that were dismissed for decades until the evidence became impossible to ignore, I suspect the mounting lawsuits and public awareness will eventually force builders to stop treating mold as someone else's problem—particularly since so little would be needed to fix it, and if buyers simply knew to demand it, cutting these corners would no longer be worth it.

Lastly, much of what was touched upon here (e.g., ozone and chlorine dioxide) is part of a much larger body of work I am still compiling, and I sincerely appreciate each of you whose support has made it possible to explore subjects like this one in the depth they deserve.

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A Midwestern Doctor Oct 25

Author

Interesting email I got from a reader:

Mould: I've read lots of studies, and pure vitamin C works in many cases. Biologists and physiologists in the past considered it to be particularly effective. (The problem is the high level of contamination in vitamin C. If you request the COA, you'll find that 99.5 per cent of it contains lead, arsenic and many other substances.)

My own example: I suffered for two years; the doctors didn't know what was wrong with me. I live in Hungary, and during the socialist era there was proper medical science. If I was ill as a child, they would send every bodily fluid for culture and testing. (blood, urine, sputum, stool) They prescribed medication based on the results. After 1991, we became 'Americanised' and there are no longer any tests; just broad-spectrum antibiotics. In most cases, this is of no use whatsoever.

Whilst reading Tibetan healing books, I came across an old remedy that is still used today: inhaling salt water through the nose until it reaches the throat.

Doing this twice a day, combined with 5–6 grams of vitamin C daily, helped me a great deal.

I'm not saying it's a cure-all, but it worked for me, and it's really cheap. You just need to make sure you're using pure vitamin C.

regards (köszönettel)

Victor Kis

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1 reply

Chris Chris Oct 25

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I was a builder most of my life. Living in California since 1955, I have always built the wood, stick frame method. I have had units of studs delivered to the job site that the truck driver stated he picked them up the previous day from a mill that the wood had just come out of the mill pond the day before, were bundled and shipped. When the bands were busted , water would ooze out and in many cases white mold was sticking 2 or more studs together. Often there was black mold already on the studs. This was in the days before anything was questioned. As I worked as a building inspector the Building Codes of the day and time never addressed these things as an issue. I'm over 80 now and I enjoy watching new construction in my area and what I see is many of the same practices still going on. I see in local news law suits going on in larger complexes involving mold intrusion. Wood coming from the north west is never moisture checked. Then rapidly enclosed and traps moisture inside with all the necessary means to grow the mold. As a FEMA inspector I saw the results of flooding, like in Florida, where homes were completely submerged under water. Then the growth of mold was thought to be mitigated by drying the building then replacing interior walls with not addressing the mold that sprung up. It seems this problem is never properly addressed.

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