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HOME IAQ REMEDIES: A LOGICAL PROGRESSION OF CHOICES

Indoor air quality is an issue that has captured a lot of attention over the last few years. As a nation we are doing more and more to control our environment in the workplace, our vehicles, and our home. Indeed, the Environmental Protection Agency (EPA) estimates that many individuals spend over 90 percent of their time in conditioned environments. Although controlled spaces protect us from the extremes of weather and temperature they can also serve to trap pollutants around us. Another EPA study graphically illustrates this with measurements that prove that indoor pollution levels can be a thousand times greater than outdoor levels of similar contaminants. Interestingly, however, despite the fact that people spend a much greater percentage of their time indoors at home than they do at work, the primary indoor air quality education and remediation efforts have been directed to the workplace.

The emphasis of IAQ in the workplace is prompted by the fact that a large number of people are gathered in a single location, which makes it easier to document the common complaints and symptoms. However, by its very nature of being a workplace, such locations are gathering places for the fittest members of our society (with the exceptions of schools, nursing homes, and hospitals which serve as workplaces for the staff but have contact with a broad spectrum of our population). It is the home where groups that can be more easily and severely impacted by indoor air quality spend most of their time. It is at home where we find important subgroups of our population that are more susceptible to illnesses exacerbated by indoor air quality problems, including infants, children, the elderly, and individuals recovering from significant injuries or illnesses.

Proper Identification Leads to Appropriate Control

One of the difficulties with indoor air quality situations is that a large number of problems are all grouped under the same heading. Dirt, chemicals, mold, dust mites, bacteria/viruses, radon, pesticide residue, and hazardous building components such as asbestos insulation and lead paint are all possible contaminants that can fall under the IAQ heading. All of these items have been shown to negatively impact the health of building occupants and, therefore, should be considered during the IAQ investigations. A comprehensive investigation also has to look beyond contaminant sources to other environmental factors such as temperature, relative humidity, and airflow. Even the quality of light in a building may have to be evaluated to find answers for IAQ complaints or illnesses.

With all these possible problem sources the most common mistake that we have observed with IAQ situations, in both homes and businesses, is that people want to move immediately to the corrective action stage before they have a good understanding of the situation. This frequently leads to a hit or miss approach where considerable resources are expended, oftentimes with marginal results. Such

shortsighted corrective attempts serve to frustrate both the occupants that are suffering the symptoms and the individuals trying to correct the “problem”.

This tendency to fix things before you know what you are fixing is enhanced not only by the wide range of potential problems incorporated into indoor air quality issues but also by the diffuse symptoms that such situations produce. In one dramatic case our organization was contacted by a homeowner who had spent four years bouncing between doctors, specialists, alternative care providers, and health food stores in an effort to deal with her problems. She was diagnosed at various points in time with fibromyalgia, chronic fatigue syndrome, sinusitis, recurring bronchitis, and asthma. In her desperation to feel better she spent over \$50,000 on doctors and even went so far as to have the mercury amalgam fillings in her teeth removed and replaced. Based on a telephone conversation and description of her symptoms we suggested that mold contamination, particularly stachybotrys, could easily explain the variety of her symptoms. When a screening check of her home with a do-it-yourself kit turned up elevated spore levels, the specific detective work began. Incredible numbers of active mold colonies were discovered under her carpets and in the wall cavities from subslab moisture penetration. Within weeks of her home being properly cleaned, her symptoms diminished.

In that particular case, and many others in both the residential and commercial sector, figuring out what the problem was turned out to be more difficult than actually fixing the problem. There are, however, a number of tips that are useful in identifying indoor air quality issues promptly and effectively. The first of these is to treat complaints seriously. If one member of the family has frequent headaches, constant sniffles, or recurring bouts with asthma-like symptoms, don't just assume that it's a cold or whatever happens to be “going around”. Observe and question other family members to see if the problem/symptoms are isolated to a single individual or are more widespread but just haven't made it to the conscious level. An expansion of this tip about treating complaints seriously is to collect detailed information on the symptoms from each individual and write them down in columns so that an easy comparison can be made.

Another positive aspect of writing down complaints and symptoms is that specific patterns of behaviors that trigger the symptoms and/or long term trends may become visible. Symptoms related to seasons, weather patterns, use of air conditioning, etc. may show up if complaints are tracked in written form.

Another technique that is helpful in correctly identifying IAQ problems is a thorough investigation. Oftentimes we become too complacent, particularly in our own homes, about environmental factors that could be affecting our health. We know the roof leaks a little bit, but put off making a repair or replacement. While such a leak may not be enough to cause severe structural damage to the house, it can provide a moisture source to allow a significant colony of mold to get started in the attic or wall cavity. Ultimately, procrastination over such minor repairs may result in extensive renovation and cleaning being necessary. Other times our complacency is such that we don't even recognize the source of a problem. Many pipe leaks in wall cavities or under cabinets go undetected for long periods of time until substantial damage has already occurred. In a similar fashion, homeowners may not look closely enough at shower or bathtub caulking or window glazing to notice that a gap has formed and a water leak is underway. A thorough annual inspection of the entire house is a good preventive measure, just as an annual medical check-up or car tune-up avoids problems in the long run. Checklists available from home improvement stores and internet sites help a homeowner break through the veneer of

complacency to look at their dwelling with a critical eye for preventing structural and indoor air quality problems.

The collection of samples is the last investigative technique that we recommend for homeowners. This recommendation of deferred sampling is at odds with many of our professional colleagues who encourage testing as a first step. A symptoms survey and critical visual inspection usually are enough to pinpoint problem areas which would allow more targeted sampling to be conducted if verification or quantification of a problem is necessary. At a minimum, enough investigation should be done so that a logical determination can be made about the sort of sampling that should be conducted: chemical, fungal, bacteriological, etc. In the complex cases where screening samples have to be collected we are fortunate that newer cost-effective techniques are now available for business and homeowners alike. Simple broad screen sampling for dust, mold, pollen, dust mites, and other particulates can be done with simple test kits (e.g. www.molddoctor.com and others). Several companies have chemical sampling devices that are as easy to use as radon canisters, but they collect more complex bacteria and virus samples from surfaces and ducts.

Prioritizing Corrective Actions

As noted earlier, the wide range of contaminants and conditions which fall under the general heading of indoor air quality problems makes it difficult to lay out an absolute list of corrective priorities that will work for every situation. Nevertheless, our experience with hundreds of homeowners shows that a number of trends are common and that certain activities have the best chance of having a positive impact on a family's home and health. These priorities are also arranged in an order that accommodates cost considerations, with the less expensive corrective activities listed first:

Do a thorough house cleaning. Use your survey to identify containers of old chemicals, pesticides, paints, fuels, deodorants, firewood, scrap lumber, and other materials that could harbor biological growth or become a source of chemical contaminants. Dispose of these items, but do it properly. Most communities have home hazardous waste collection places where unnecessary fuels, spray cans, and chemicals will be accepted for proper classification and disposal.

Identify and correct all water intrusion problems. This can run the entire gamut from a simple spot of tar around a leaking chimney or replacement of a sink drain gasket to regrouting of bathroom tile or replacement of corroded and dripping pipes. More extensive corrections for water intrusion into the house include repair of gutters and downspouts, regrading of landscapes so that the earth and surface water slope away from the house, repair of drain tile, injection of bentonite clay along the outside of the house, or installation of water collection systems and sump pumps.

Check appliances for proper functioning. Furnaces, stoves, fireplaces, water heaters, and other appliances, particularly gas or propane fired appliances, should be checked on a regular basis by a trained professional. These checks should include measurements for carbon monoxide and natural gas/propane to minimize the chance of explosion or asphyxiation. With a recent reduction in price, the installation of carbon monoxide detectors near such appliances could also go a long way toward improving the indoor air quality at a reasonable cost.

Improve filtration on furnace and air conditioning systems. Most standard furnaces use fiberglass filters that have a relatively low efficiency rating. Upgrading to pleated paper filters, combination paper and charcoal filters, or installing electronic air filters can dramatically improve air quality in a home. The improved filtration will not only stop particulate matters such as mold, dust, fibers, etc. but will also trap the bacteria and viruses that “hitch a ride” on such particles as they make their way through the air.

Replace standard vacuums with high efficiency filtration models. Many vacuum manufacturers now have models that have HEPA filters. These high efficiency filters trap the finest dust particles that normally are propelled out of a bag or canister style vacuum after the heavy debris is deposited inside. Such vacuums are only marginally more expensive than their standard counterparts but have a significant impact on the overall cleanliness of the home’s air.

Consider having your ductwork cleaned. The ductwork is the circulatory system for the home’s air. In new homes the ducts are often contaminated with debris from the construction process while older homes could suffer from buildup of contaminants over time. A duct cleaning does not have to be an annual event but if they haven’t been evaluated or cleaned in ten years, it’s time to look.

Utilize portable room air cleaners for individuals that have asthmatic symptoms or significant allergies. The use of room air cleaners, particularly in the bedroom, can create a zone of relief for individuals that are sensitive to indoor and outdoor pollutants. Eight to ten hours of exposure to clean air in the bedroom is often enough time for many people’s bodies to recover from the assaults that occur outside, in school, or in the workplace. A word of caution is necessary as not all air-cleaning devices are the same. The safest models are those that pass the air through pleated HEPA and/or charcoal filters. Air filtration devices that add the extra feature of a negative ion generator (often referred to as an ionizer) often have a higher efficiency of filtration but many individuals react poorly to the abundance of negatively charged particles that fill a room where such devices operate. In the eyes of many indoor air quality professionals an even worse choice is an air filtration device that has an *ozone generator* incorporated into it. The ozone emitted from such units is an irritant and a number of studies have shown that such devices reduce odors by breaking long chain hydrocarbons into smaller molecules. This process may actually increase the overall level of pollutants in an area, even if it seems to smell better.

Consider a professional inspection if symptoms persist and do-it-yourself measures are unsuccessful. Time and again it has been shown that people will spend whatever it takes to find the appropriate treatment for symptoms but are hesitant to spend any money investigating the potential cause of such symptoms. Part of this psyche may be a result of the lack of standardized credentials in the indoor air quality arena and the occasional history of unqualified or unscrupulous consultants preying on people’s fears. Great strides have been made in the field of indoor air quality investigations over the last few years. As a result, most inspections now provide cost-effective solutions to real problems.

Indoor air quality is a problem that affects us all. Discussion of this invisible aspect of our environment should not be limited to workplaces, schools, or hospitals. Families everywhere can benefit from the advancements made in this industry to improve their health and the quality of their free time.

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