

## MAY INDOOR AIR INVESTIGATIONS LLC

### Spring Newsletter, 2016: *The Hidden Wonders of Basements* ©2016 Jeffrey C. May

You may not think of your basement as part of your home, but a third or more of the air in a house rises up from the basement, especially when the heat is on.

And why? Because hot air rises and leaks out of the attic, and air from the basement then takes its place. In the heating season, this flow can be especially strong indoors when the windows are closed. Indoor-air-quality (IAQ) problems in your basement can therefore affect the air quality in the rest of your house.

Warm weather is approaching, so you won't be needing the heat in your house much longer; still, you can take steps this spring and summer to improve conditions in your basement.

Mold is a common problem in basements.



*Mold-growth spots on a foundation wall and vacuum*  
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Please note: Sometimes people mistake soot patterns for mold growth. Diluted bleach (one part bleach to five parts water) will decolorize mold; if you apply diluted bleach to soot stains, though, the stains will not disappear.

If you see soot stains, call a technician to check your boiler or furnace. Combustion products that are back-drafting into a house can contain carbon

monoxide as well as soot. Jar candles also produce a lot of soot.



*Soot streaks on foundation wall and ceiling from oil burner spillage*  
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Efflorescence patterns are sometimes mistaken for mold growth. When moisture migrates from the exterior through concrete, it dissolves some minerals in the concrete. When the moisture evaporates on the inner side of the concrete wall, the minerals crystallize and remain behind, sometimes looking like clumps or lines of fuzzy growth. This material is made of minerals and is not mold, but still, the presence of efflorescence indicates a moisture-intrusion problem in a basement.



*Efflorescence on a foundation wall*  
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Mold requires moisture for growth, so you want to keep water out of your basement. One of the main causes of water-intrusion problems in basements is poor control of roof water at the exterior.

It's therefore important to keep your gutters and downspouts clean. Check to be sure downspouts are connected properly and are directing water away from the foundation. If needed, add splash blocks or insert the downspouts into underground piping (4-inch solid PVC piping buried about two inches below the soil, and extended to daylight downhill from the house or to the edge of a landscape furrow).

An easy way to test for drainage problems is to run water from a hose at the end of a downspout and see if water enters the basement.



*Basement water near the bulkhead*  
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Even if you are vigilant about maintaining your gutter system, if your basement has ever experienced water intrusion from the exterior, you may have a high water table in your neighborhood. If this is the case, you may have to install a sump pump in your basement.

There are also other ways to direct water away from the house. Confer with a landscape professional to see if the land outside your house needs to be regraded so that it slopes away from the foundation.

You can also consider installing a foundation “skirt”: impervious material that is attached to the exterior of the foundation and that slopes down and away from the house about a foot below the surface and to a distance of about two and a half feet. If your home is located next to a hill, you can have a berm (or swale) built to direct water away from your house.

Adjustments to the grading outside your house, and/or installation of a foundation “skirt” or berm can be done when the ground has thawed in the spring.

Mold can also grow in basements that haven’t had water intrusion.

Basements are naturally cool and damp. As air cools, its relative humidity (RH) rises. Some mold species can flourish when the RH exceeds 80%, even in the absence of liquid water from water intrusion or pipe leaks.

All below-grade (below ground-level) spaces must be dehumidified in the humid season (in a four-season climate, that means approximately mid-April to mid-October). Use a dehumidifier that’s adequate

for the space. Attach the machine to a condensate pump, so that it can drain directly to the exterior; or support the dehumidifier over a sink; that way, the machine won’t turn off the way it does when the bucket is full. Measure the RH separately with a thermo-hygrometer, available in many home supply stores. In an unfinished basement, the RH should be no more than 50%.

In finished basement spaces, the RH should be at or below 60% in the humid season. Air conditioning can control the RH in a finished basement, but if your thermo-hygrometer confirms that the RH is over 60%, add dehumidification.

You do not need to dehumidify a basement (finished or unfinished) in the heating season, but you must heat a finished basement when you heat the rest of the house – whether you are using the space or not. Otherwise, the RH will likely rise high enough for mold growth to occur.

In a finished basement that has had water intrusion or elevated relative humidity conditions, mold growth can be barely visible white or yellow splotches on the bottom foot or so of walls (especially in exterior corners). Mold can grow on the bottoms or backs of furniture facing the cool floor or walls, in biodegradable dust captured in the carpeting laid on a cool, concrete floor, and even on the ceiling facing the cool floor.



*Mold growth on a paneled basement ceiling*  
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In an unfinished basement, mold can grow on foundation walls and on stored goods. Believe it or not, mold can also subsist on the dust captured in exposed fiberglass insulation, which is often installed below-grade. That’s one of the reasons it’s not a great idea to saw wood in a basement; biodegradable sawdust can collect on walls, ceilings, the floor, and even in exposed fiberglass.

Mice love to nest in exposed fiberglass.



*Mouse burrows and droppings in fiberglass insulation*  
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Mice can be the source of unpleasant odors, especially if they die inside wall and/or ceiling cavities. And a recent study correlated elevated levels of mouse urine indoor with exacerbated asthma symptoms.



*Mouse urine trails on a drain pipe*  
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*Mouse urine trails a drain pipe and on wires*  
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And where there are mice, there can be shrews. These animals look a little like mice but have longer snouts. They eat meat, including mice, and in the last few years, have begun to nest in the wall and ceiling cavities of homes and even businesses.



*A dead shrew inside a furnace*  
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You don't want shrews in your home, because like skunks, they emit a powerful musk that can make rooms or the whole house uninhabitable.

Pay attention to conditions in your basement. Your health and the health of other occupants in your home may depend on it!

**Do you have any questions about indoor air quality?**

I'd like to include some questions and answers in some of these newsletters. Send me a question ([jeff@mayindoorair.com](mailto:jeff@mayindoorair.com)), and if I choose your question to answer, you will receive a complimentary copy of my book *My House is Killing Me*.

