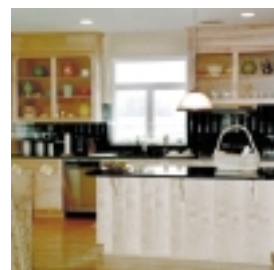
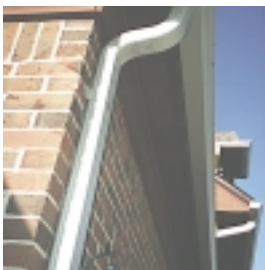


Healthy and Affordable Housing: Practical Recommendations for Building, Renovating and Maintaining Housing

READ THIS

BEFORE YOU MOVE IN



Asthma Regional Coordinating Council
of New England

U.S. Department of Energy



Program Partner

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DISCLAIMER

This document and the recommendations within do not represent federal or state government policy. They are the opinions of the authors.

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The Building Connection

Housing and Asthma

Asthma is a serious disease that affects millions of Americans, particularly children. Asthma is also increasing at an alarming rate. Many air pollutants are found at higher levels indoors than outdoors. Among them are the most common asthma triggers: particles from molds, dust mites, mice, rats, roaches and pets.

Indoor air contains other pollutants such as carbon monoxide, volatile organic compounds (chemicals released from materials), nitrogen dioxide, sulfur dioxide, radon and other particles that can make people sick or make asthma worse.

Some indoor air pollutants come from outside. These include ozone, sulfur dioxide, carbon monoxide, pollens and other particles that can also make people sick or make asthma worse.

What you bring into your home, how you live in your home and how you clean and maintain your home affect the quality of air in your home. You can control many of these sources of pollution that otherwise can make you sick or make your asthma worse.



Asthma affects millions of Americans, especially children

The Seven Steps to a Healthy Home

There are seven steps to a healthy home. A healthy home is:

- Dry
- Clean
- Well Ventilated
- Combustion Product Free
- Pest Free
- Toxic Chemical Free
- Comfortable

How you live in your home affects each of the seven steps. Water, clutter and dust provide the conditions and ingredients for mold, insects, mice, rats, roaches and dust mites to make their home in your home. Pests inside your home can lead to allergic reactions; pests lead to the use of pesticides that are not good for people to breathe or ingest (eat). Food and water are an invitation for pests to live in your home. If you keep your home clean and dry you will have a home that is healthy and comfortable for you at the same time that it is not a friendly place for these unwelcome pests.

Ventilation removes stale air from your home and brings fresh air inside. This helps to remove some of the pollution that builds up inside your home. But you have to use the fans or ventilation system to keep your home from becoming stale and unhealthy. If ventilation is inadequate, moisture can build up increasing the humidity in your home. High humidity levels make the air feel sticky and uncomfortable for most people. Mold and dust mites, however, love high humidity. So comfort, no pests and good indoor air quality go hand in hand.

Burning gas or oil produces combustion products such as carbon monoxide — these should never be present in a healthy home. Smoking is a form of combustion; so don't let anyone smoke inside your home. Keep your home a healthy home.

What people bring into homes and store inside can often lead to problems. The containers that store toxic chemical cleaning compounds, solvents and oil-based paints slowly release the chemicals into the indoor air. Don't bring these products into your home. When in doubt, get them out by disposing of them properly.

Living in Your Healthy Home

Getting Started

The first thing is to do is to learn about your home. Familiarize yourself with the operation of all appliances and equipment. Learn where the main water and gas shut off valves are. Learn where the electrical panel is and which switch turns off the electrical power. Learn how to turn off the water to the clothes washer and to the hot water tank in case a hose bursts or they begin to leak.

Probably the most important thing to learn about your home is how to report problems and to report them right away. If a leaky pipe leaks a little bit for a long time major problems can occur.



Sealed combustion

Dry

Too much water in your home is bad. Too much water results in mold, insects, rodents and mites. Remember that a healthy home is a dry home.

One of the worst things you can do is use a humidifier. Humidifiers add uncontrolled amounts of water to indoor air. They also have to be cleaned each week.

If you must use a humidifier – don't – use a vaporizer.

If you must use a vaporizer, if we can't convince you not to use one, keep the interior relative humidity below 30 percent in the winter. To monitor humidity you need a measuring device called a hygrometer. Clean the vaporizer regularly if you use it.

If you have bathroom fans use them when you are in the bathroom, especially when showering. They remove water from bathrooms.

If you have a kitchen fan use the fan when you are cooking. Especially when you are cooking with water. Boiling water is a humidifier. And you already know how we feel about humidifiers.



Kitchen exhaust hood

If you have a clothes dryer, make sure it is vented to the outside. If you vent it inside it is a humidifier...and you already know how we feel...

Plumbing leaks need to be fixed – right away. Find out how to shut off your water if you have a leak. Report the leak and insist that it get fixed. Be a pest. It's important.

Leaking clothes washers and leaking hot water tanks can be a major headache and need to be fixed right away.

Basements are often damp. Don't store anything in a damp basement.

Mold will probably grow on what you store in a damp basement. If your basement is damp run a dehumidifier.

Don't open your basement windows in the summertime, the basement will only get wetter. Outside air in the summertime is humid and the moisture in it will condense on cold basement walls the same way water condenses on the outside of a cold glass.

If you have a dry basement and you want to store stuff in it – don't. But if you must, use wire or plastic racks or shelving that elevates things above basement floor slabs and allows lots of air circulation. Don't let any paper or cardboard touch the floor or a wall. Better still, don't store any paper products or fabrics in your basement. Use sealable plastic containers.

While we are talking about storage, don't store things in attics either. This advice only applies to attics without floors. It's important that attics are well ventilated and storing things in attics interferes with air flow and also probably causes problems with attic insulation. The only thing that should be in your attic is air – and insulation.

If you have gutters or downspouts, keep them clean. Don't disconnect gutters and downspouts. Keeping water away from the walls helps keep your basement dry.

And finally don't install wallpaper in your home. Why? Wallpaper keeps walls from drying if they get wet – especially vinyl wallpaper. Trapped moisture allows mold to grow.



Gutters and downspouts

Clean

Dust is bad; it contains asthma triggers. Over two thirds of dust in homes originates outdoors, and is tracked in on feet. House dust is known to contain many hazardous materials. Stop the dust at the door. Take off your shoes and provide a space for your shoes at the door. Provide a welcome mat and keep it clean. Vacuum and filter the rest away. And make the home easy to clean. Don't clutter your home.

A good trick is to have a pair of inside shoes and a pair of outside shoes.

Use a vacuum regularly. If you can afford one, get a vacuum with high efficiency filtration and an embedded dirt detector (it indicates when the floor is clean). Check the bag regularly. Replace the bag when necessary.

When you use cleaners use mild cleaners and soaps. Don't turn the area under your sink into a toxic chemical dump by storing powerful chemical cleaners. Don't store pesticides there.

Change your furnace filter regularly – or insist that it be changed. Filters should be rated at MERV 6-8 (35 percent or better dust spot efficiency).

Don't use or purchase an ozone air cleaner. Ozone is a respiratory irritant and can trigger asthma attacks. And while we are at it, don't use air fresheners or room air deodorants. They are indoor air pollutants that mask problems and deaden the senses if they are not causing respiratory problems on their own.



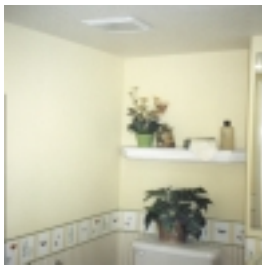
High efficiency furnace filter

Well Ventilated

Dilution is the solution to indoor pollution that cannot otherwise be prevented or removed.

Almost everything in your home gives off chemicals or moisture. If there are too many pollutants in the air that you breathe you have a problem. Since people love their possessions and we can't get rid of their possessions or find possessions that don't give off pollutants we have to ventilate the pollutants in the indoor air out.

Oh by the way, people also give off stuff – moisture, odors, carbon dioxide....we'll stop the list here because it can get pretty ugly. So even in a house without stuff, the people in the house need ventilation air to dilute the "bio- effluent" they themselves generate. People also cook – well some of them do – and generate more stuff. You get the picture.



Bathroom exhaust fan

Use your bathroom fans, when you are in the bathroom and after showering.

Use your kitchen fan when cooking.

Open your windows when it is not too cold (or when it is not too hot or humid if you have air conditioning).

When you are cleaning, especially with powerful cleaning agents (the stuff we told you not to store under your sink), open your windows and turn on an exhaust fan.

If you can, ventilate your dry cleaning before you hang it in your closet. Air it out outside if you can. Or on a porch, or in your garage. Or in a room with an open window. Better still buy clothes that don't need to be dry cleaned. Some "dry clean only" clothes can be washed – but be careful.

Combustion Free

When something is burned it produces products of combustion, particularly carbon monoxide and particles that are unhealthy. Products of combustion should never be found in the indoor air of a healthy home.

Don't smoke in a healthy home.

Don't burn candles in a healthy home – at least not the scented ones. The aromatic candles generate soot and other bad stuff (chemicals that are not good to breathe).

When you cook use the kitchen fan.

Don't ever use a gas oven or the stove top to heat your home.

Don't purchase or use ventless kerosene or gas space heaters.

If you have a garage don't operate your car in the garage (except to get it in or out). Certainly don't warm it up in the garage. And never run your car in the garage with the door to the house open.

Pest Free

Infestations of cockroaches, mice and rats can all cause allergic reactions. Even after the pests are gone, their skin, hair and feces can remain and cause allergies.

Making a home pest resistant produces a healthier home two ways: it reduces exposure to allergens and asthma triggers released by the pests and it can reduce the amount of pesticides used.

Keep them out. Keep bushes and trees at least 3 feet from homes. Bushes and trees near a home provide food, a living place and sheltered passage for pests such as rats, mice, birds, roaches and ants. Don't store trash and clutter near buildings.

Block pest entries. Seal utility openings and joints between materials. Use corrosion proof materials such as copper or stainless steel mesh. Rodents can chew through many materials.

Reduce food and water availability. Keep kitchen waste in covered containers. Don't leave food out. Clean your dishes. Don't pour grease down drains.

Don't use moth balls. They release chemicals that are not good for people. If a pesticide is necessary get a professional who specializes in integrated pest management to apply it. Don't use wall injected pesticides – except boric acid.

In the Northeast, dust mites do not generally colonize buildings because buildings are too dry for much of the year. They colonize bedding, stuffed animals and favorite chairs because we humidify these things with our bodies. Control is by washing these items in hot water (greater than 130° Fahrenheit), which kills the mites and washes away allergens.

Toxic Chemical Free

Toxic cleaning compounds, pesticides, oil- or alkyd-based paints and solvents can contaminate the air. Many of the containers these products are stored in slowly release the chemicals into the indoor air. These products should not be stored inside the house. When in doubt, get them out and dispose of them properly.

Finally, don't do unusual things indoors like welding or stripping paint from furniture.



Improper storage of pesticides

Comfortable

If you are uncomfortably dry in the winter and you decide to use a humidifier, do not over humidify your home. Limit interior relative humidities to less than 30 percent in the winter. To measure the relative humidity you need a measuring device called a hygrometer.

In the winter keep you blinds open to capture solar gain.

In the summer keep your blinds drawn to reject solar gain. This is particularly important for west facing windows.

If you have removable storm windows, remember to install them for the winter.

If you have air conditioning do not over-cool your home. Temperatures below 75 degrees Fahrenheit can cause problems with summer sweating within walls (where you can't see it) and the condensation can promote mold growth.

Ten Do's and Don'ts for a Healthy Home

1. Keep your home dry

- a. Avoid humidifiers
- b. Run exhaust fans in bathrooms and kitchen
- c. Fix water leaks quickly and dry out what got wet
- d. Beware storing “things” in damp basements
- e. Drain rain water away from the building
- f. Beware wallpaper especially vinyl

2. Keep your home clean

- a. Stop outside dirt at the door
- b. Vacuum and clean thoroughly at least weekly
- c. Avoid toxic cleaning compounds
- d. Replace furnace filter regularly
- e. Don't use ozone air cleaners
- f. Don't use air fresheners and room air deodorants

3. Keep your home well ventilated

- a. Run exhaust fans or ventilation system
- b. Air out dry cleaned clothing

4. Keep your home free of combustion products

- a. Don't smoke inside
- b. Don't burn candles
- c. Don't heat with a gas oven or stove
- d. Don't heat with a ventless (unvented) kerosene or propane heater
- e. Don't warm up an automobile in an attached garage

5. Keep your home pest free

- a. No plants or litter within 3 feet of the building
- b. Block up pest entry holes in outside walls

6. Keep your home free of toxic chemicals

- a. Don't use or store toxic chemicals or pesticides inside

7. Keep your home comfortable

- a. In the winter keep your blinds open or shades up to capture heat from the sun
- b. In the summer shade your windows or lower blinds
- c. Remember to install your storm windows for the winter months

8. Know how to shut off the water supply, gas supply and electrical power

9. Know who to contact for plumbing leaks and flooding

10. Occasionally check for water leaks in the following places:

- a. Under sinks
- b. Around washing machines
- c. Under the hot water heater

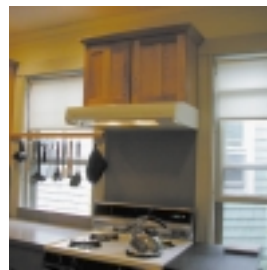
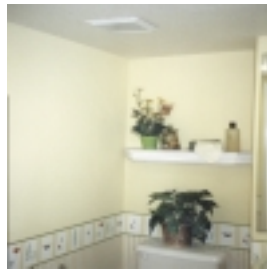
Notes

1. The water shut off valve is located:

2. The gas shut off valve is located:

3. The main electrical shut off switch is located:

4. For plumbing leaks or flooding call:



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