

Healthy Housing

What Everyone Should Know

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What is Healthy Housing?

Healthy Housing is

- Designed,
- Constructed,
- Maintained, and
- Rehabilitated

in a manner that is conducive to good occupant health.



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The Link Between Housing & Health



“The connection between health and the dwelling of the population is one of the most important that exists”.

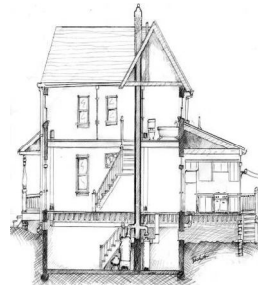
Florence Nightingale

Cited in Lowry, S. BML 1991, 303, 838-840



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7 Healthy Homes Principles



Keep It:

1. Dry
2. Clean
3. Ventilated
4. Pest-Free
5. Safe
6. Contaminant-Free
7. Maintained

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Why Do We Care About Healthy Homes?



Young children spend **nearly 80%-90%** of their time inside.

Housing affects health both directly and indirectly:

- Physical, chemical, biological exposures
- Psychological



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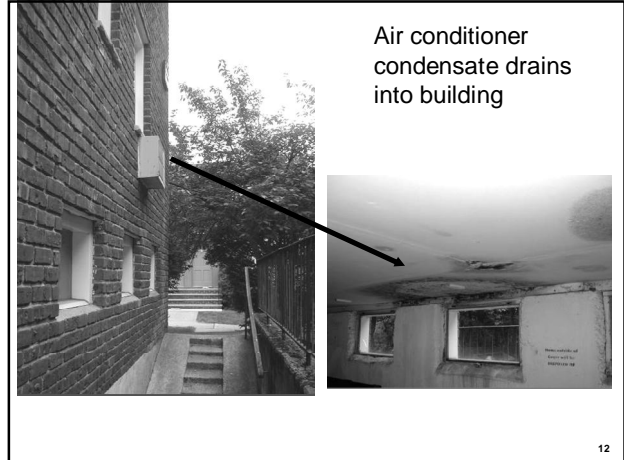
Keep It Dry

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Keep It Dry

- Poorly managed rainwater/groundwater
 - Poor roof, wall, window & foundation drainage
 - Defects in rain barriers
- Plumbing leaks
- Condensation on surface
 - Surfaces chilled by mechanical equipment, earth contact, outdoor air contact
- Construction moisture
 - Concrete, wet spray cellulose, gypsum mud
 - Damp earth in crawlspace

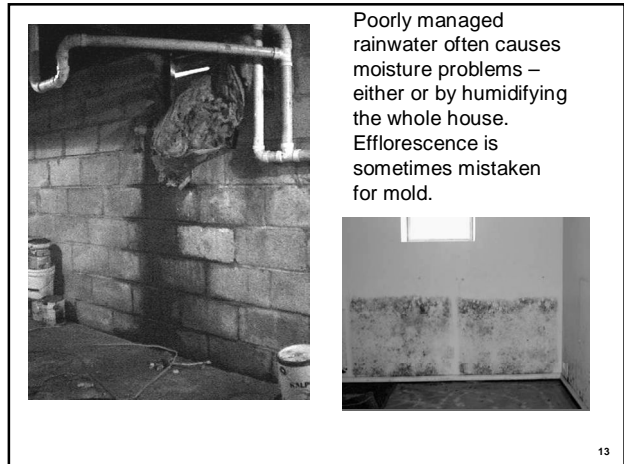
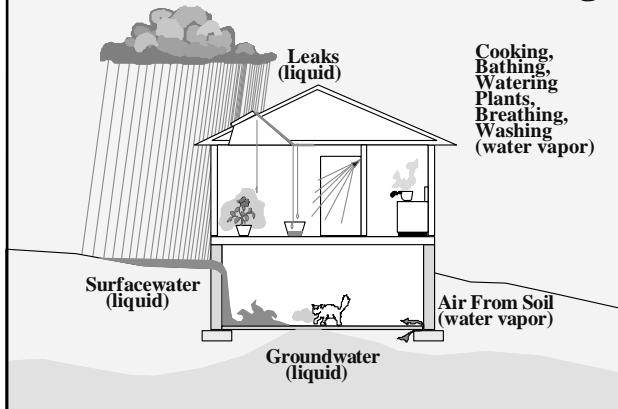
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Air conditioner condensate drains into building

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How Water Enters a Building



Poorly managed rainwater often causes moisture problems – either or by humidifying the whole house. Efflorescence is sometimes mistaken for mold.

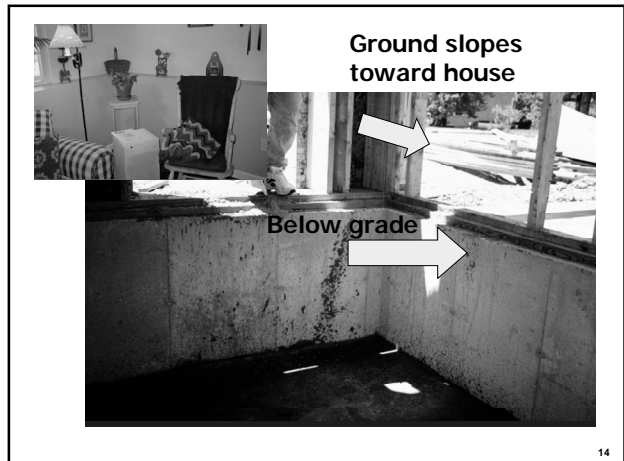
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Overhangs Work



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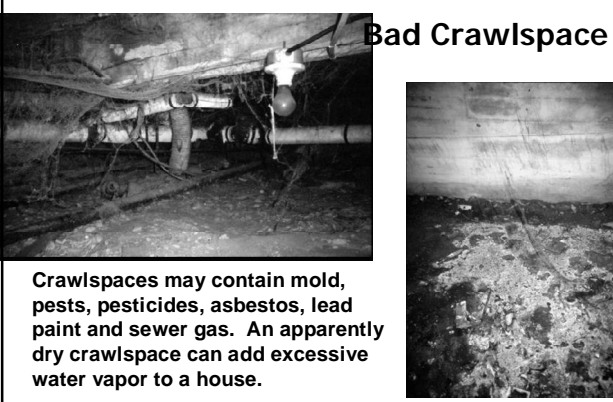
Ground slopes toward house



Below grade

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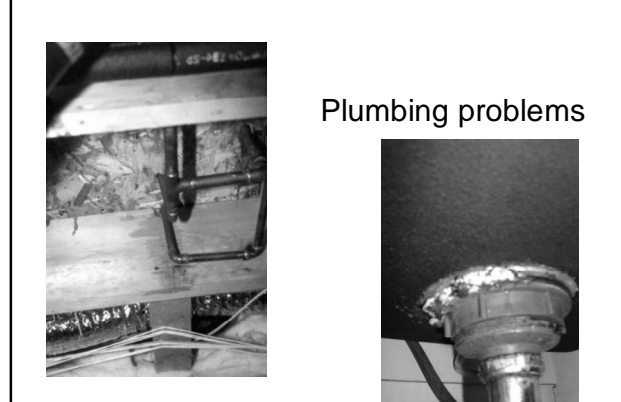
Bad Crawlspace



Crawlspaces may contain mold, pests, pesticides, asbestos, lead paint and sewer gas. An apparently dry crawlspace can add excessive water vapor to a house.

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Plumbing problems



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Good Crawlspace




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Leaky refrigerator drip pan causes mold



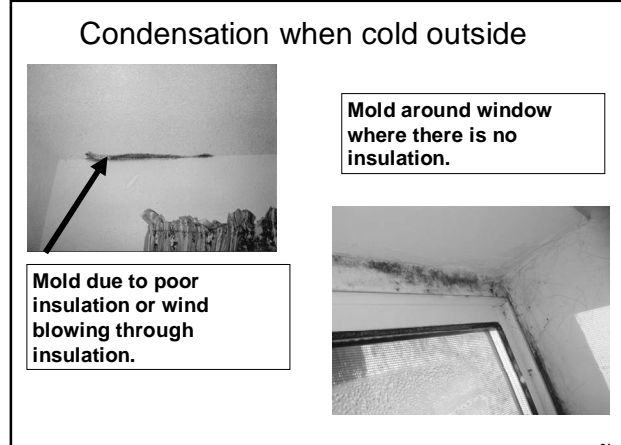
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Good Crawlspace



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Condensation when cold outside



Mold around window where there is no insulation.

Mold due to poor insulation or wind blowing through insulation.

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Keep It Clean

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Where does house dust come from?

- Brought-In
- Home-Grown
 - Lead Dust
 - Dust Mites
- Resident-Made
 - Garbage
 - Clutter



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Keep It Clean

- Reduces exposure to:
 - Chemical contaminants
 - Allergens
 - Pest droppings and urine
 - Pesticides and consumer chemicals
 - Heavy metals like lead and arsenic
- Reduces places for pests to live

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How can we make buildings more cleanable?

- Use mats at entryways
- Create dust away from people.
- Provide smooth, cleanable surfaces
- Reorganize - to help avoid clutter
- Choose flooring that is easy to clean
- Use vacuums that filter well and can be emptied quickly and thoroughly

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Humid buildings may be colonized by dust mites.

In dry climates dust mites are limited to porous materials that get humidified.



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Isolate Problems



Keep pets off beds and out of bedroom.

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Cleanable Flooring



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Keep It Ventilated

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What to look for in a vacuum?

- Beater Bar
- Vacuum Strength
- Filter Type
- Dirt Sensor



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Keep It Ventilated

- Pollutants can be found in concentrations 2 - 5 times higher indoors than outdoors.
- Good ventilation can reduce hazards of:
 - Volatile organic compounds
 - Moisture
 - Environmental tobacco smoke
 - Particulate matter
 - Allergens
 - Mold
 - Carbon monoxide
 - Radon

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What cleaning is a problem?

- Carpet cleaning
- Overuse of anti-microbials
- Sanitizers
- Air fresheners

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Combustion Contaminants?

- Carbon Monoxide
 - Fatigue, headaches, dizziness, confusion
 - The "Silent Killer"
- Nitrogen Dioxide
 - Eye, nose, and throat irritation
 - Shortness of breath
- Moisture
 - Leads to damp indoor environments

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Sources of Combustion Products

- Using oven as heater
- Spillage from furnace, water heater, fireplace
- Ventless heater or fireplace
- Car exhaust from attached garage



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Find the exterior exhaust



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Carbon Monoxide

Approximately 300 deaths plus more than 100,000 medical visits occur per year.



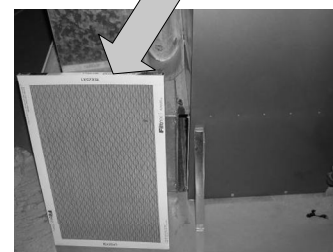
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Filter Heated and Cooled Air



Poorly sealed access panel

Well sealed panel



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Carbon Monoxide Alarms

- Protects Against Life-Threatening Conditions
- Where:
 - Near sleeping area
 - On every level of a home
 - Do not install above or beside fuel-burning appliances



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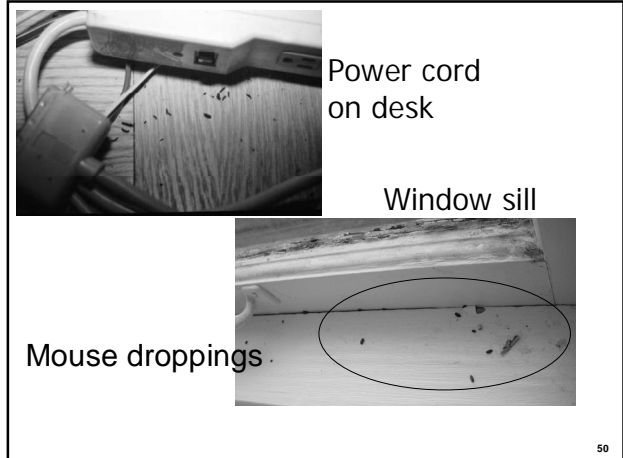
Keep It
Pest-Free

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Keep It Pest-Free

- Integrated Pest Management
 - Housekeeping
 - Maintenance
 - Exclusion
 - Ongoing Monitoring
 - Pesticides only when needed

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Why Pest Free?

Health effects associated with pesticides include:

- Eye, nose, throat irritation
- Skin rashes, stomach cramps, nausea
- Central nervous system damage
- Kidney damage
- Increased risk of cancers



Use of some pesticides associated with increased risk of childhood leukemia.

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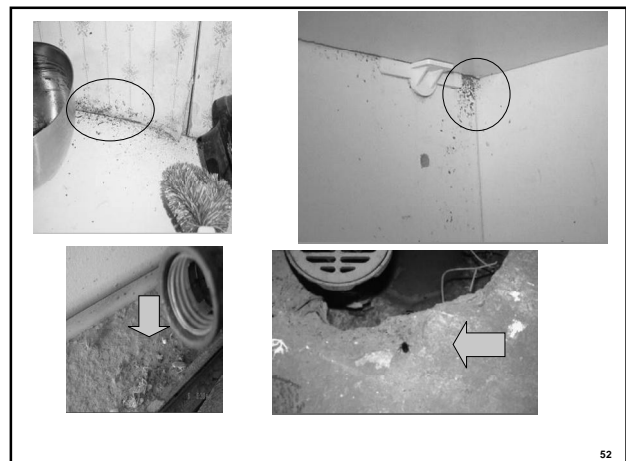


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Integrated Pest Management

- Keep them out and give them no place to hide
 - Change landscape
 - Block entries, passages, hiding places
- Reduce food availability
 - Proper food storage and disposal
 - No dirty dishes in the sink overnight
 - Clean crumbs, grease etc.
- Knock down population
 - Traps
 - Appropriate pesticides

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Holes in Wall



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Illegal and Risky Pesticides

- Pesticides that look like candy
- Insecticide chalk (aka Miraculous or Chinese chalk)
- “Tres Pasitos”



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Keep It Safe

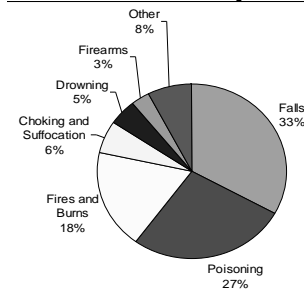
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Link to HUD’s IPM Guidance

- http://www.healthyhomestraining.org/ipm/ HUD_IPM_5-24-07_pih2007-12.pdf

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Keep It Safe



What are the most common causes of home injury deaths?

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There are many ways to be injured in the home



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Common Home Contaminants

- Lead and Lead-Based Paint
- Environmental Tobacco Smoke
- Radon
- Biologicals
- Combustion By-Products (see Keep It Ventilated)
- Pesticides
- Asbestos
- Volatile Organic Compounds (VOCs)
- Sewer Gas

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Which age groups are most susceptible?

Falls are leading cause of nonfatal home injury for children from birth through 14 and for older population.



Adults 80+ years of age are at **20** times higher risk for death from injury than younger individuals.

The highest rate of injury death for infants is from **choking and suffocation**.



Highest rate of injury death for 1-14 year olds is **fires and burns**.

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Health Effects of Lead - Children -

- Reduced IQ
- Learning disabilities
- Impaired hearing
- Reduced attention spans, behavior problems
- Anemia
- Kidney damage
- Damage to central nervous system
- Coma, convulsions, death

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Keep It Contaminant-Free

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Lead Sources

- Peeling, Chipping Paint / Deteriorated Paint
- Dust
- Soil
- Drinking water
- Consumer Products such Pottery, Cribs, Jewelry, Candle Wicks
- Cultural Items
- Contaminated Sites

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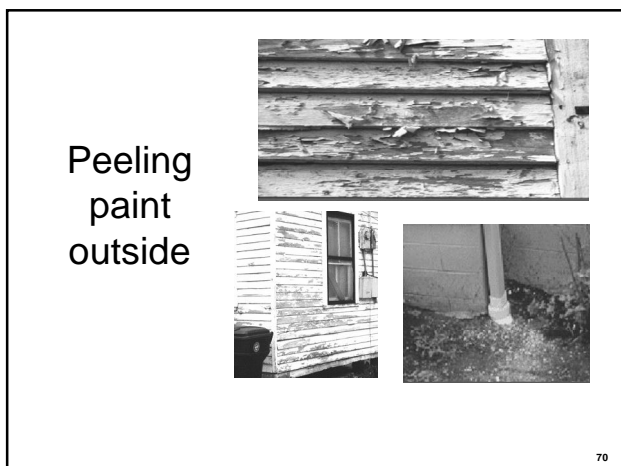
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LEAD EXPOSURE

- Swallowing or breathing lead dust is the most common way people are exposed
- Very small amounts are toxic
- Often there are no symptoms



There is no known safe level of lead in the body



Peeling
 paint
 outside

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Lead Safe Work Practices

- Worker Protection
- Set-up Containment
- Don't use Prohibited Practices
- Conduct thorough cleanup

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Age of House Matters

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All US Housing Stock	40 percent

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REDUCING HAZARDS IMMEDIATE ACTION

If you have a lead hazard and children under 6

- Clean the house
 Wet clean and HEPA vac
- Keep kids away from hazards
- Cover window sills
- Block Access



Lead and Gardening

- Do not allow children to play in soil unless it has been tested
- Plan your garden
- Test your soil
- Wash fruits and vegetables in a vinegar or dish soap solution

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Asbestos: Health Effects

- Lung Cancer
- Mesothelioma
- Asbestosis

Smokers are at greater risk!



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Recommendations for Contaminated Soil

- Barriers
- Soil removal
- Raised Beds
- Cover soil

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Environmental Tobacco Smoke

Contains over 4,000 substances including more than 50 compounds known to cause cancer.



Health effects include:

- In non smoking adults: lung cancer, heart disease.
- In children: asthma, sudden infant death syndrome, bronchitis, pneumonia, ear infections.

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Asbestos:
What is it?



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What Can You Do About Tobacco Smoke in Homes and Cars?

- Quit, if you're ready there's help
- Don't smoke around children
- Smoke outside
- Exhaust vent the places where people smoke

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Volatile Organic Compounds

- Environmental Tobacco Smoke
- Paints
- Cleaning chemicals
- Carpets
- Pressed wood furniture
- Air fresheners
- Vinyl floors



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VOC Solutions

- Control the source
 - Avoid using products that contain VOCs
 - Use lower VOC options (i.e. paints)
 - Keep containers sealed
 - Store away from air draw sources
 - Remove unwanted products from home
- Ventilate
 - Open doors and windows
- Don't use what you don't have to

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- VOC concentrations are 2-5 times greater in the home.
- During or immediately after paint stripping activities, VOC levels can be 1,000 times higher than outdoors.

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Sewer Gas

- A mix of gases made by bacteria and fungi wastes
- Comes from dried out traps in sinks and toilets, public sewers, septic systems, swamps, and ponds
- Contains methane, hydrogen sulfide, ammonia, carbon dioxide, and carbon monoxide
- Causes asphyxiation, leading to unconsciousness, brain damage, and death.



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Why Avoid VOCs?

Potential Health Effects:

- Eye, nose, throat irritation
- Headache, nausea, loss of coordination
- Liver, kidney, and brain damage
- Cancer
- Child developmental problems



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Keep It Maintained

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Keep It Maintained

- Inspect
- Clean
- Lubricate
- Replace
- Repair
- Organize

Healthy Homes Maintenance Checklist

This checklist is designed to help you identify and address common health and safety hazards in your home. It is organized into sections based on the type of hazard or maintenance task. Check off the items that you have inspected and found to be in good condition. If you find a problem, check the appropriate box to indicate the status of the problem and the action you plan to take.

Check & Repair

Check for lead-based paint					
Check for radon					
Check for mold					
Check for asbestos					
Check for carbon monoxide					
Check for radon					
Check for mold					
Check for asbestos					
Check for radon					
Check for mold					
Check for asbestos					

Check & Clean

Check for dust					
Check for dirt					
Check for debris					
Check for clutter					
Check for clutter					
Check for clutter					
Check for clutter					
Check for clutter					
Check for clutter					
Check for clutter					
Check for clutter					

Check & Lubricate

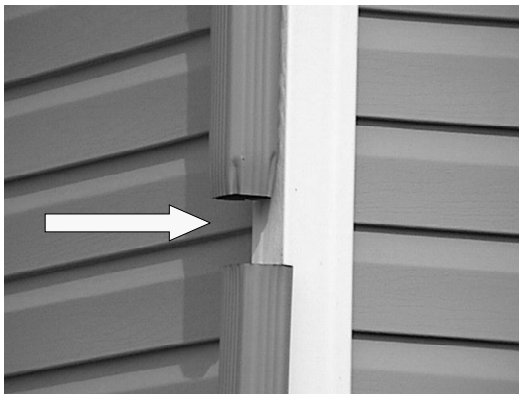
Check for lubrication					
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Check for lubrication					

Check & Replace

Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					
Check for replacement					

Check & Organize

Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					
Check for organization					



Earthquake Safety

- Check for hazards in the home
- Identify safe places indoors and outdoors
- Educate yourself and family members
- Have disaster supplies on hand