
The Principles of Healthy Housing and how housing can impact the health of a child



Serving Alaska, Hawaii, Idaho, Montana, Oregon, Washington and Wyoming

Aileen Gagney MArch, MFA, GA-C, HH-S. DST, CLR
Environmental and Lung Health Program Manager

Special thanks to the National Center for Healthy Housing, The National Healthy Housing Training Center & Network, and the UW Northwest Center for Public Health Practice for the use of some of their concepts and materials in this presentation.

The 7 Principles of Healthy Housing

From the National Healthy Homes Training Center and
Network

- Keep it Dry
 - Keep it Clean
 - Keep it Pest Free
 - Keep it Ventilated
 - Keep it Safe
 - Keep it Contaminant Free
 - Keep it Maintained
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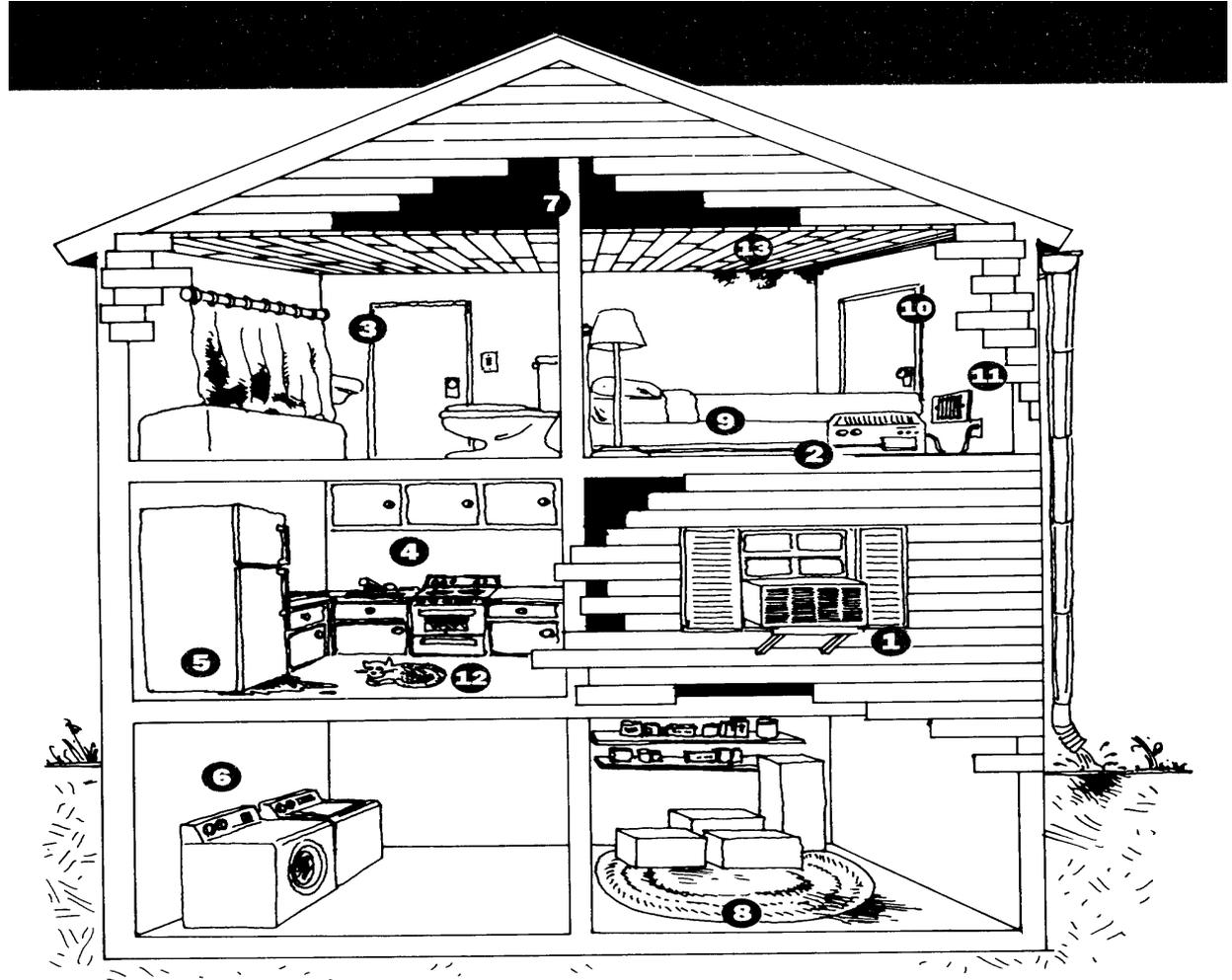
Keep it Dry – Institute of Medicine report on mold and moisture and related health effects

- Upper respiratory tract symptoms
- Coughing
- Wheezing
- Asthma symptoms
- Hypersensitivity
- Pneumonitis



Keep it Dry

- Where do we find problems?



Keep it Dry - Exterior

- Check all downspouts and gutters for proper drainage
- Keep gutters clean and free of debris
- Repair all leaks
- Repair all basement and/or crawlspace moisture penetration



Keep it Dry - Interior

- Locate all leaks and repair
- Install dehumidifier if needed
- Cover crawlspace dirt with 6 mil black plastic



Keep it Dry - Interior

Humidity levels in the home should be between 30% - 50%



Keep it Dry

- Molds require sufficient moisture, temperature and a food source to grow
- Molds can grow on cloth, carpet, leather, wood, sheet rock, insulation and on food



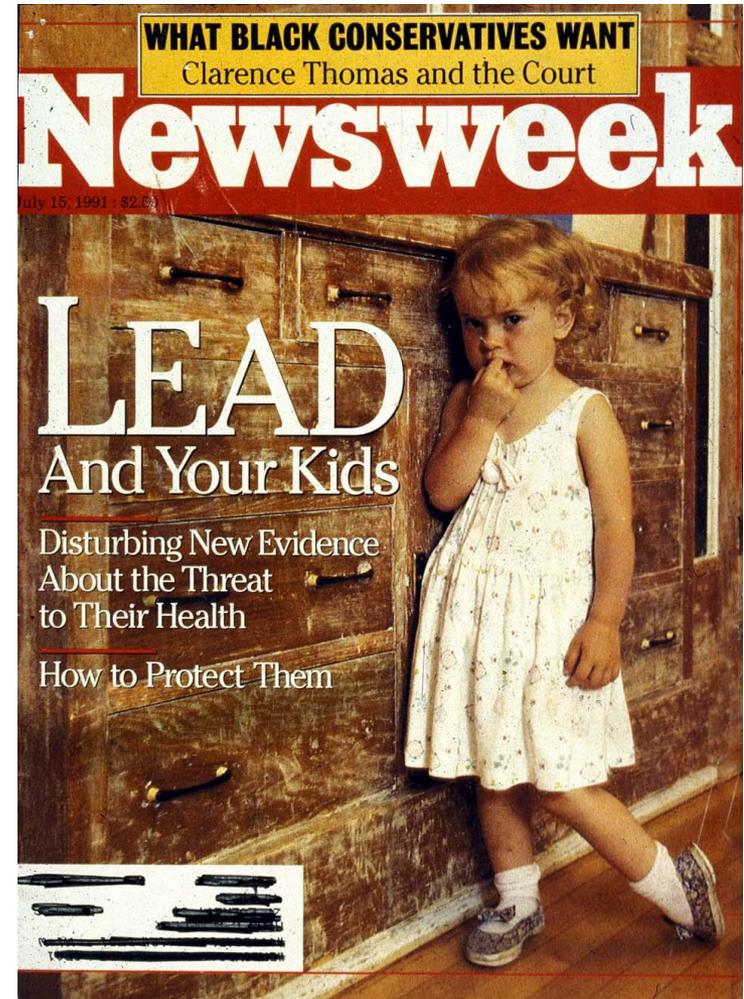
Keep it Dry

- Do not test for mold
- Clean the affected area with a soap and water solution
- Do Not Use BLEACH
- If the affected area is larger than 2 square feet, consider having it professionally removed and remediated



Healthy Housing - Keep it Clean

- Dust in the home can be inhaled and it can also be eaten after it falls on food, hands or on anything that can be put in the mouth
- The infant is most susceptible to pollutant exposure because it inhales 2 ½ times more than adults



Keep it Clean

- A lot of the same factors that can contribute to allergic reactions, asthma episodes or poor indoor air quality can be caused by dust



Keep it Clean

- Dust has been found to contain industrial chemicals, flame retardants and pesticides such as DDT (banned in the 1970's and 1980's)



Keep it Clean - What's in house dust?

Amorphous (tiny pieces of everything around us)

Minerals from soil

Skin flakes

Soot, fly ash, charred wood (fuel combustion)

Tire fragments

Paper & cotton fibers

Glass fibers (insulation)

Paint spheres

Pesticides

Lead

Cadmium

Gypsum

Fiberglass

Carpet fibers

Dust mite parts and feces

Mold spores

Rug dyes

Fire retardants

Dander

Insect hair

Keep it Clean

It is far easier to **prevent** track in of pollutants than to remove them

- Use a high quality walk off mat at all doors
- Remove shoes at the door



Keep it Clean

- Damp dust and change water frequently
- Using a vacuum cleaner with a rotating brush reduces lead by 3 times
- Vacuums with a power head are two to six times as effective at picking up dust
- Vacuum weekly using a high quality vacuum with a HEPA filter and a bag
- Have the vacuum serviced annually



Keep it Clean

- Use a dust mask while vacuuming if you are affected by dust
- Consider removing all carpeting or when installing carpeting, choose low pile or level loop
- Have the carpet hot water steam extracted twice yearly



Healthy Housing - Keep it Pest Free

- Pests are animals or plants that cause annoyance, damage or disease
 - Rats and Mice
 - Cockroaches
 - Fleas
 - Dust Mites
 - Termites
 - Carpenter Ants
 - Bed bugs



Keep it Pest Free

Health Effects

associated with pests:

- Asthma
- Hantavirus
- Plague

Health effects of pesticides
used to **treat** pests:

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

Keep it Pest Free – What to look for

- Creature droppings
- Nests and burrows
- Food – under sinks, in kitchens and trash bins
- Hidden places – inside walls, behind cabinets, basements
- Near entry holes



Keep it Pest Free – How to treat

Habitat Modification

- Reduce food and water sources
- Store food in pest-resistant containers
- Reduce clutter
- Eliminate easy access
- Seal access routes



Keep it Pest Free – How to treat

- Use traps, baits and gels
- Use pesticides **only** as a last resort



Healthy Housing – Keep it Ventilated

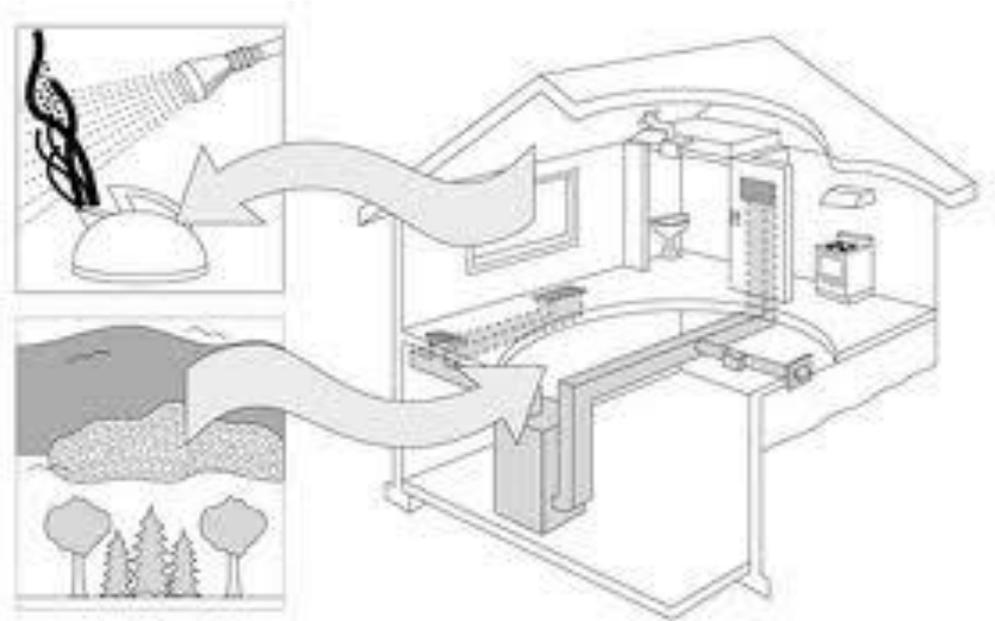
- According to the EPA, we spend over 90% of our time indoors
- Our indoor air can be five times as polluted as the outdoor air



Keep it Ventilated

Indoor air quality in buildings depends upon many factors:

- ❑ Sources of pollution within the building
- ❑ Sources of pollution outside the building
- ❑ The exchange of air between inside and outside the building



Keep it Ventilated

- Leakage through exterior surfaces:
 - Doors, windows, cracks/gaps in structure
- Exhaust Fans
 - Bathroom and kitchen exhaust fans, clothes dryers, central vacuum systems, whole house cooling fans, air conditioners

- Combustion Appliances
 - Furnaces, woodstoves, fireplaces



Keep it Ventilated

- Combustion Air Supply
 - The air supplied to the stove or furnace used to burn the fuel (wood, coal, natural gas or propane)
- Forced Air Ductwork
- Attics, Crawlspace and Walls



Keep it Ventilated – Issues?

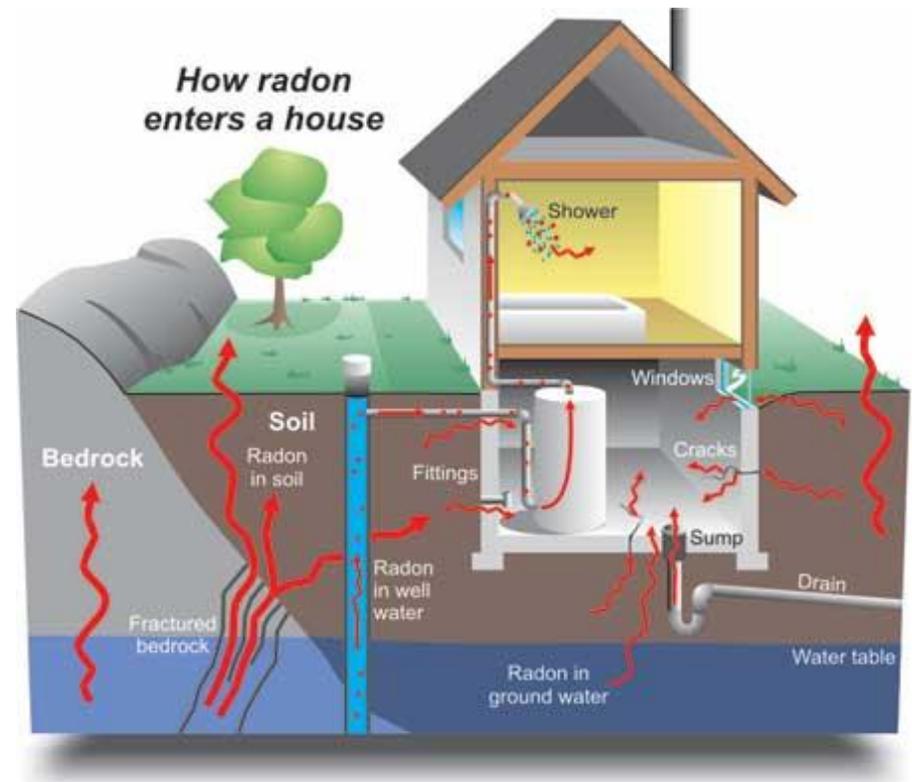
- Is there excessive moisture or odors?
- Is the house drafty?
- Is there a combustion appliance? And does it have an adequate air supply?
- Can you smell fuel odors?
- Does the pilot light go out frequently?



Keep it Ventilated

Proper ventilation can reduce:

- Volatile Organic Compounds (VOCs)
- Radon
- Moisture
- ETS
- Particulate matter
- Allergens
- Carbon Monoxide



Keep it Ventilated - Health effects of pollutants

- Radon – second leading cause of lung cancer
 - Combustion appliances- Carbon Monoxide (the silent killer), Nitrogen Dioxide and Sulphur Dioxide
 - VOC's - These chemicals can have short term or long term effects (nose, throat discomfort, headache, nausea, allergic skin reaction, nausea, fatigue, dizziness) and some can cause cancer (formaldehyde)
-

Keep it Ventilated – Other sources of pollution

Oil, Gas, Kerosene, Coal
or Wood

Tobacco Products
Building Materials

Furnishings and
Cabinetry

Personal Care Products
Pesticides

Household Cleaning
Products

Paints Space Heaters
Dry Erase Markers, etc.

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Keep it Ventilated

A well ventilated building provides:

- Local Exhaust to remove pollutants at the source
 - Whole House by supplying fresh air to reduce contaminants
 - Control of airflow so that airflow coming through the building can't carry contaminants into and around the house
-

Keep it Ventilated – Key Concepts

- If any portion of air leaves a house, the same amount must enter
 - Air like water, seeks the path of least resistance
 - Heated air rises
 - Cooled air falls
 - Air can be hot, cold, wet, dry or polluted when it enters or exits a house
-

Keep it Ventilated

Things that need
exhaust ventilation:

- Bathrooms
- Clothes dryers
- Kitchen ranges
- Boilers, furnaces,
water heaters
- Fireplaces and wood
burning stoves



Keep it Ventilated

- Bathrooms:

Install a 60 min timer on fan and clean the cover yearly

- Clothes dryers:

Use metal ductwork and vent to exterior

- Kitchen:

Vent fan to exterior and clean filter regularly

- Boilers, furnaces, water heaters

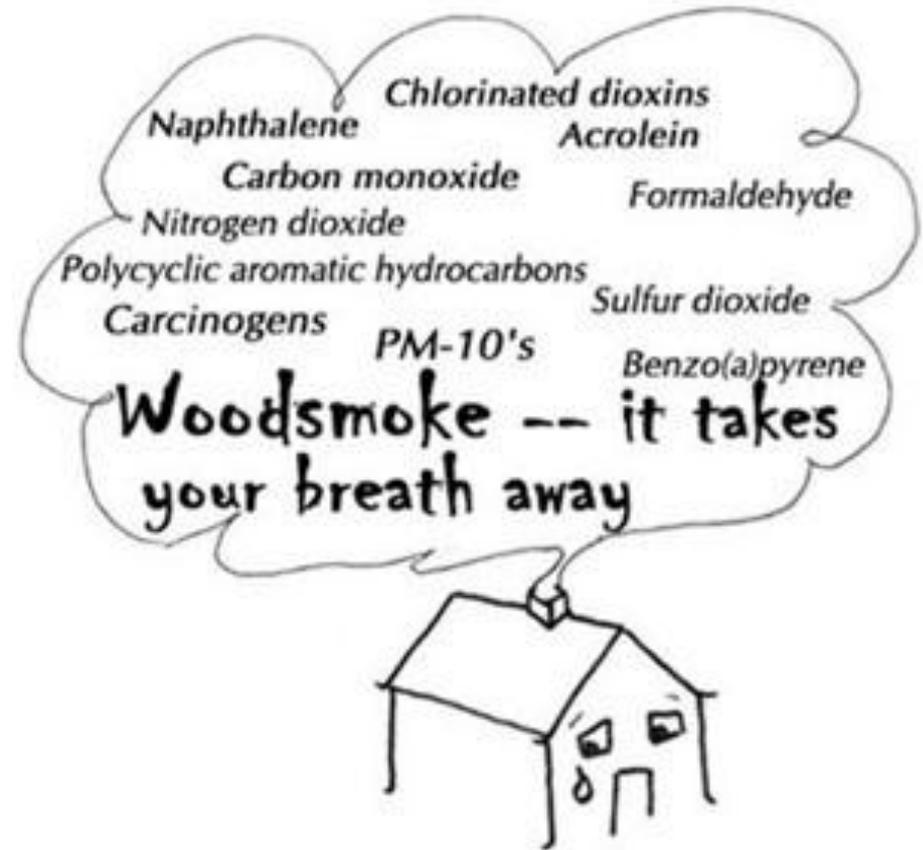
Have all combustion appliances serviced annually

- Fireplaces and wood burning stoves

Replace with gas or electric inserts – if you must burn, please burn responsibly!

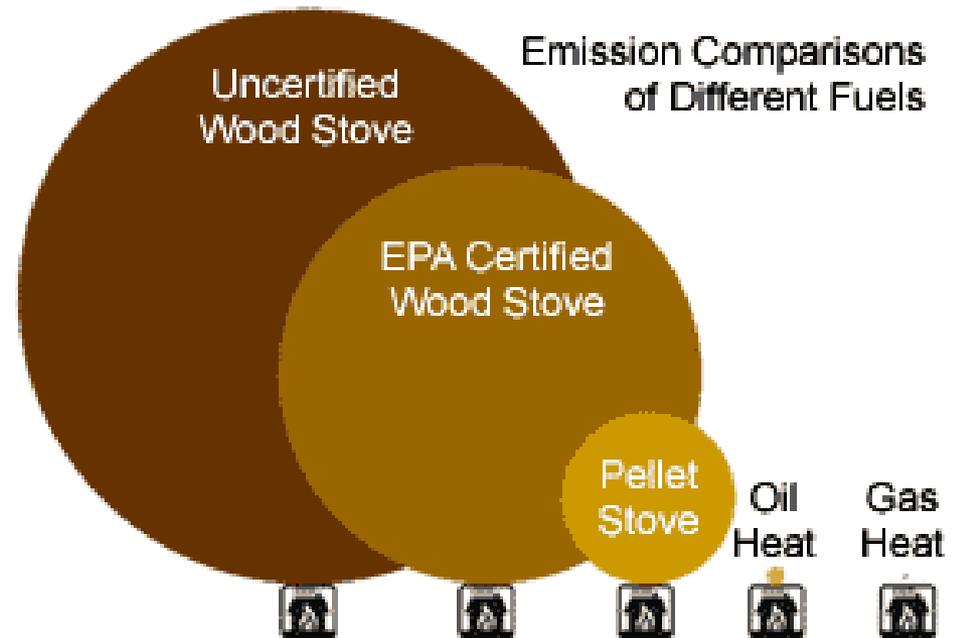
Keep it Ventilated - Wood Smoke

- Chemicals and tiny smoke particles are one of the biggest concerns as they are inhaled deep into the lungs where they can become lodged. They can cause structural damage and chemical changes to the lung tissue



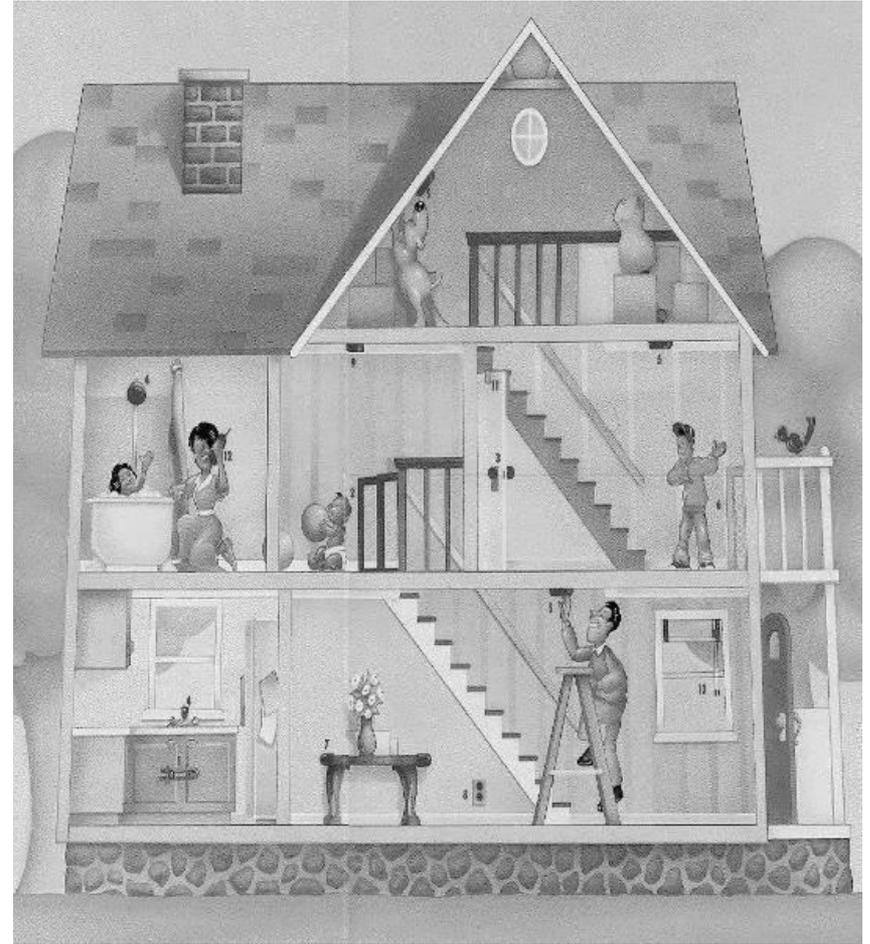
Keep it Ventilated - Wood Stoves

- In Washington State nearly half of all households have wood burning stoves, inserts or fireplaces.
- Wood smoke is the main source of air pollution in many residential areas in the winter
- Wood smoke pollution indoors can reach up to 70% of outdoor levels...even in homes that do not burn wood



Healthy Housing – Keep it Safe

- There are many ways to be injured in the home



Keep it Safe

Accidents are events that happen completely by chance, with no planning or deliberate intent.

Injuries are preventable: they do not occur at random



Injury is the leading cause of death and disability among children and young adults

Keep it Safe – 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 have a 20 times higher risk of death from injury than younger people



- 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**

Keep it Safe – Housing Features for children



Outlet covers



Door guards?



Safety Glass?



Window Safety Guard

Keep it Safe



Smoke detector



Fire extinguisher
and first aid kit



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CO detector

Keep it Safe - Labels



- Food, Drugs and Cosmetics
 - Food and Drug Administration
- Pesticides
 - Environmental Protection Agency

Keep it Safe - Labels



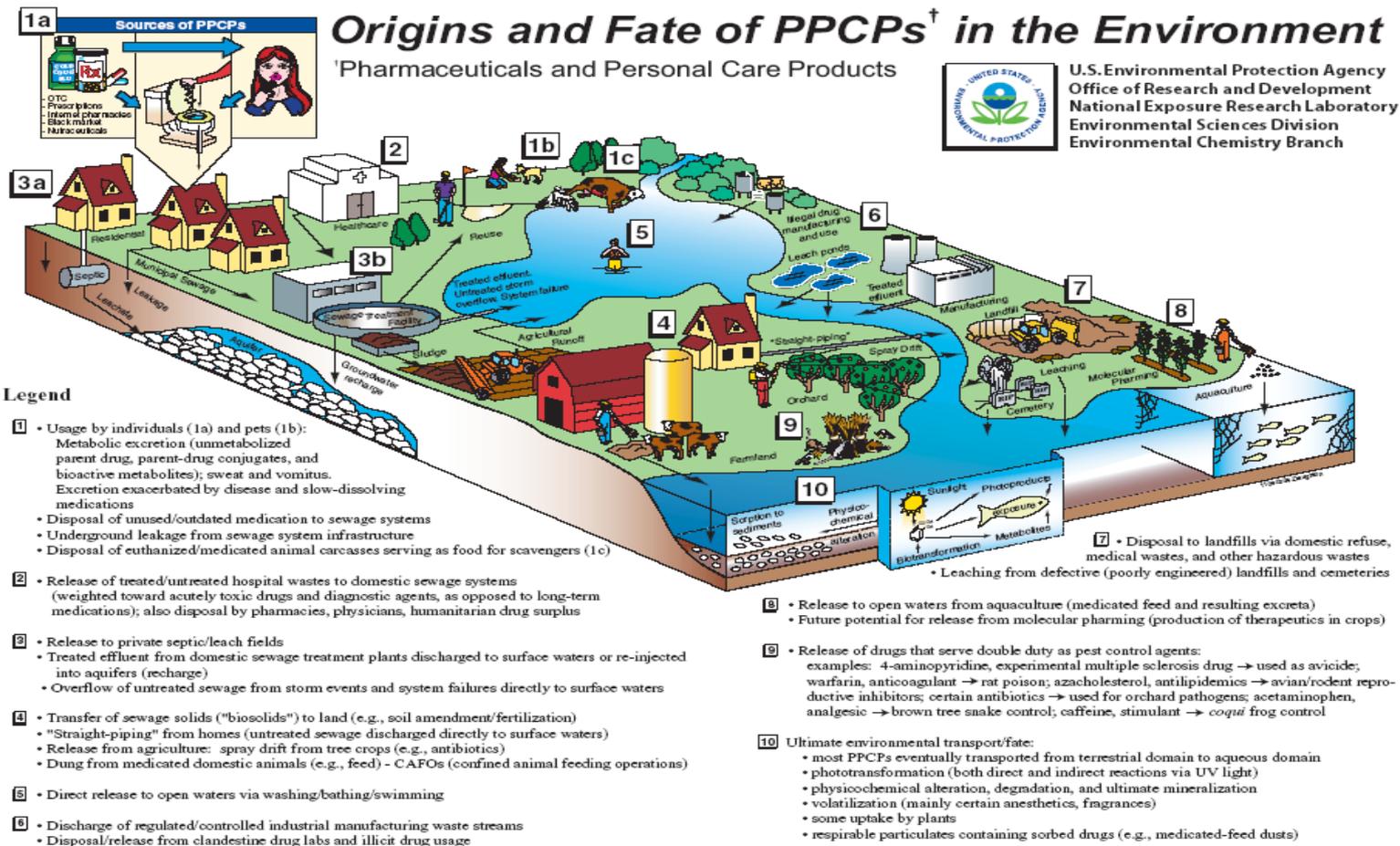
- Other Products Containing Hazardous Substances
 - Consumer Products Safety Commission (CPSC)
- Material Safety Data Sheets (MSDS)
 - Occupational Safety and Health Administration

Keep it Safe



- Almost half of all households with children under 5 stored pesticides within reach of children
- In 2003, Poison Control Centers reported 113,000 cases of pesticide poisoning

Keep it Safe - Origins and Fate of Pharmaceuticals and Personal Care Products



U.S. Environmental Protection Agency
 Office of Research and Development
 National Exposure Research Laboratory
 Environmental Sciences Division
 Environmental Chemistry Branch

Keep it Contaminant Free - Sources

Bring It In:

- Construction
- Everyday
- Soil

Building Structure:

- Off-Gassing
- Decay

Building System:

- Furnace
- Mold

Living Things:

- Plants
 - Pets
 - Dust Mites
-

Keep it Contaminant Free - Priorities

- Lead and Lead-Based Paint
 - Environmental Tobacco Smoke
 - Radon
 - Biological's (see Keep It Dry)
 - Combustion By-Products (see Keep It Ventilated)
 - Pesticides (see Keep It Pest-Free)
 - Asbestos
 - VOCs
 - Sewer Gas
-

Keep it Contaminant Free - Lead



Keep it Contaminant Free - Asbestos



- Health Effects:
- Lung Cancer
 - Mesothelioma
 - Asbestosis



Keep it Contaminant Free - ETS

- Reduced lung function growth
- Asthma and exacerbation of asthma
- Acute respiratory illness
- Chronic respiratory symptoms
- Acute and chronic ear disease
- Sudden Infant Death Syndrome



Keep it Contaminant Free - ETS

- Increases the number of episodes and severity of symptoms for children with asthma
 - Risk factor for new cases of asthma in children
 - Responsible for 150,000 to 300,000 lower respiratory tract infections in infants and children less than 18 months of age
 - 60% of US population has biological evidence of exposure to second hand smoke
-

Keep it Contaminant Free – VOC's

- Paints
- Cleaning chemicals
- Carpets
- Pressed wood furniture
- Air fresheners
- Vinyl floors
- Candles
- Dryer sheets



Keep it Contaminant Free – VOC's

Potential Health effects of VOCs:

- Eye, nose, throat irritation
- Headaches, nausea, coordination
- Liver, kidney, and brain damage
- Some can cause cancers
- Child development

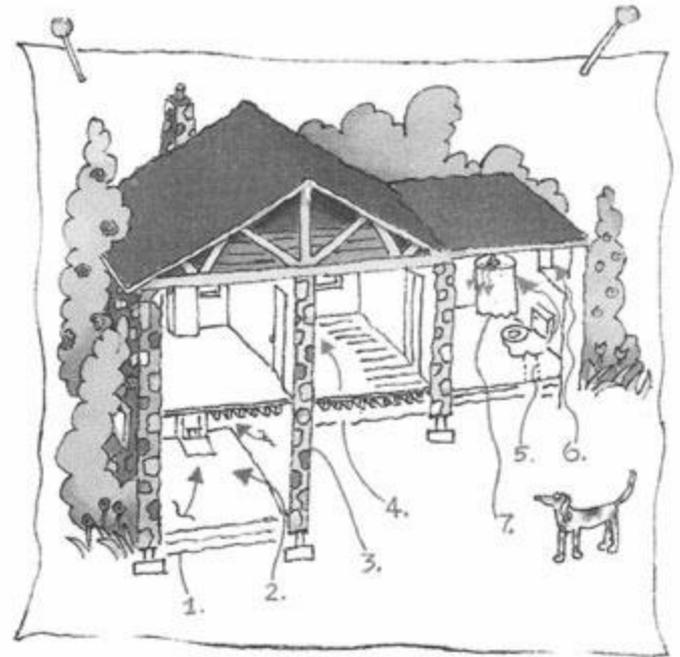


Keep it Contaminant Free – VOC's

- 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, Ventilate, Ventilate!
-

Keep it Contaminant Free - Radon

- Radon is a naturally occurring gas produced by the breakdown of uranium and radium in ground
- 2nd leading cause of lung cancer after smoking with more than 20,000 deaths annually
- Leading cause of lung cancer in nonsmokers and people who have never smoked



Keep it Contaminant Free – Radon tests

- Short Term

Minimum 48 hours - \$10-\$20

Useful results (home sales, rental, occupancy)

- Long Term

91 days to 1 yr - \$20-\$30

Better indicator of need to mitigate

If result is 4 pCi/L or higher take a follow-up test OR fix the home



Keep it Contaminant Free – Sewer Gas

A mixture of gases generated by bacteria and fungi while digesting wastes

- Often contains methane, hydrogen sulfide, ammonia, carbon dioxide, and carbon monoxide

- Source - Dried out traps in drains, especially in floor drains or homes that have been vacant for awhile



Healthy Homes - Keep it Maintained

Systems that require maintenance:

- Solid waste
 - Water supply
 - Sewer system
 - Heating/cooling
 - dehumidification/
humidification
 - Cooking
 - Ventilation
 - Rainwater
control/drainage
 - Structural integrity
 - Storage /
Organization
-

Keep it Maintained - Actions

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



Keep it Maintained

Checklists:

Weekly

Monthly

Seasonally

Yearly



National Center for Healthy Housing
National Healthy Home Training Center and Network

Healthy Homes Maintenance Checklist

The following checklist was developed for the Healthy Homes Training Center and Network as a tool for healthy home maintenance. A healthy home is one that is constructed, maintained, and rehabilitated in a manner that is conducive to good occupant health.

To maintain a healthy home, occupants should keep it dry, clean, and pest-free, and prevent injury and control chemical contaminants both indoors and outdoors. Good home maintenance can act to reduce allergens, prevent illness, and reduce injury from accidents. This checklist provides basic guidelines; items may need to be checked more often depending on local conditions and manufacturer suggestions.

Developed for the National Healthy Home Training Center by Terry Bravman, Contractor Association and Elain Toka, CRT Associates.

Yard & Exterior	Spring	Fall	Annual	As Needed	No. Needed?
Water drains away from house	✓				
No trip, fall, choking, sharp edge hazards	✓	✓			
Fence around pool intact	✓	✓			
Check for signs of rodents, bats, roaches, termites	✓	✓			
Drain outdoor faucets and hoses		✓			
Clean window wells and check drainage	✓	✓			
Clean gutters and downspouts	✓	✓			

Basement & Crawlspace	Spring	Fall	Annual	As Needed	No. Needed?
No wet surfaces, puddles	✓	✓			
Sump pump and check valve working	✓	✓			
Floor drain working	✓				
Vacuum basement surfaces	✓				
Check for signs of rodents, bats, roaches, termites		✓			

Exterior Roof, Walls, Windows - check for leaks	Spring	Fall	Annual	As Needed	No. Needed?
Shingles in good condition	✓				
Check chimney, valley, plumbing vent, skylight flashing	✓				
Make sure gutters discharge water away from building	✓				
Check attic vents		✓			
Check attic for signs of roof leaks	✓				
Check for icicles and ice dams			winter		
Look for peeling paint, efflorescence	✓				
Look for signs of leaks where deck attaches to house	✓				
Check below window & door that flashing intact	✓				
Repair broken, cracked glass			✓		
Look for signs of leaks at window and door sills	✓				
Clean dryer vent	✓	✓			
Check exhaust ducts are clear	✓	✓			

Maintenance Done Not Done or Not

Building a lead-safe and healthy home environment for all children • 10275 Incept Circle, Suite 100, Columbia, MD 21044 • www.centerforhealthyhousing.org

The 7 Principles of Healthy Housing

Questions?

Thank you!

Aileen Gagney

206.441.5100 x 14 agagney@alaw.org

American Lung Association
