



# Healthy Homes for Healthy Kids




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# What is a Healthy Home?


A **HEALTHY HOME** is a home designed, constructed, maintained, or rehabilitated in a manner that **supports** the **health of residents**.


# WHY DO WE CARE ABOUT HEALTHY HOMES?




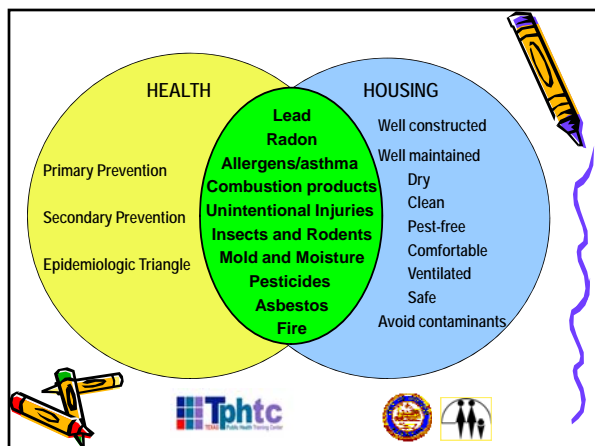
# WHY DO WE CARE ABOUT HEALTHY HOMES



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



Housing affects health both directly and indirectly:  
 Physical, chemical, biological exposures  
 Psychological

Summary of Two Key Institute of Medicine Reports Regarding Asthma, Indoor Air Quality, Damp Indoor Spaces, and Mold

Association Between Biological and Chemical Exposures in the Home and Development of Asthma in Sensitive Subpopulations		Exacerbation of Asthma in Sensitive Subpopulations	
Biological Agents	Chemical Agents	Biological Agents	Chemical Agents
Household mold	Household mold	Household mold	Household mold
Household dust	Household dust	Household dust	Household dust
Household pests	Household pests	Household pests	Household pests
Household cleaning products	Household cleaning products	Household cleaning products	Household cleaning products
Household pesticides	Household pesticides	Household pesticides	Household pesticides
Household asbestos	Household asbestos	Household asbestos	Household asbestos
Household radon	Household radon	Household radon	Household radon
Household lead	Household lead	Household lead	Household lead
Household mercury	Household mercury	Household mercury	Household mercury
Household volatile organic compounds (VOCs)	Household volatile organic compounds (VOCs)	Household volatile organic compounds (VOCs)	Household volatile organic compounds (VOCs)
Household formaldehyde	Household formaldehyde	Household formaldehyde	Household formaldehyde
Household carbon monoxide	Household carbon monoxide	Household carbon monoxide	Household carbon monoxide
Household nitrogen dioxide	Household nitrogen dioxide	Household nitrogen dioxide	Household nitrogen dioxide
Household sulfur dioxide	Household sulfur dioxide	Household sulfur dioxide	Household sulfur dioxide
Household ozone	Household ozone	Household ozone	Household ozone
Household particulate matter	Household particulate matter	Household particulate matter	Household particulate matter
Household carbon disulfide	Household carbon disulfide	Household carbon disulfide	Household carbon disulfide
Household hydrogen sulfide	Household hydrogen sulfide	Household hydrogen sulfide	Household hydrogen sulfide
Household ammonia	Household ammonia	Household ammonia	Household ammonia
Household hydrogen cyanide	Household hydrogen cyanide	Household hydrogen cyanide	Household hydrogen cyanide
Household phosphine	Household phosphine	Household phosphine	Household phosphine
Household cyanide	Household cyanide	Household cyanide	Household cyanide
Household arsine	Household arsine	Household arsine	Household arsine
Household silane	Household silane	Household silane	Household silane
Household borane	Household borane	Household borane	Household borane
Household methane	Household methane	Household methane	Household methane
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Householdnonacosane	Householdnonacosane	Householdnonacosane	Householdnonacosane
Householdtriacontane	Householdtriacontane	Householdtriacontane	Householdtriacontane

Source: National Academies Press, 2000. Cleaning the Air: Asthma and Indoor Air Exposures. Executive Summary. Institute of Medicine. <http://www.nap.edu/catalog/52000.html>

Prepared by National Center for Healthy Housing - [www.nchh.org](http://www.nchh.org) Page 1 of 2

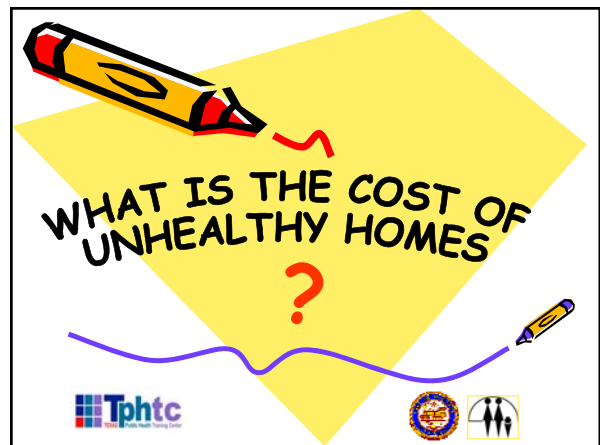
## Known / Suspected Health Effects Associated with Housing Conditions

- Respiratory infections
- Asthma
- Injuries and burns
- Reactions to extreme cold and extreme heat
- Irritations, allergy, rashes
- Poisonings, asphyxiation
- Neurotoxic exposures
- Cancer
- Death



## Health Hazards

- Lead
- Mercury
- Tobacco smoke
- Carbon monoxide
- Food contaminants
- Water pollution
- Pesticides
- Air pollution
- Dust Mites
- Mold
- Pests & Rodents
- Pets
- Chemicals
- Radon
- Asbestos



## The Cost of Unhealthy Homes

- Annual costs for environmentally attributable childhood diseases in the U.S: \$54.9 billion.
- \$43.9 Billion from Lead Poisoning
- \$ 9.2 Billion from Neurobehavioral Disorders
- \$ 3.2Billion from Asthma
- \$ 0.3 Billion from Childhood Cancer



## Categorical vs Holistic Approach

- Allergens/asthma
    - Asbestos
  - Combustion products
    - Lead
  - Mold and Moisture
  - Insects and Rodents
  - Weatherization
- Integrated approach
  - People living in the home
    - The structure
    - Potential health hazards



## The House as a System What's a house?



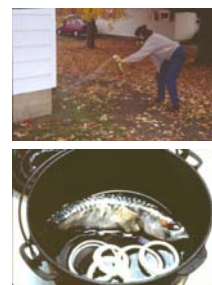
## Seven Principles of Healthy Homes

- Start with People
- Keep It Dry
- Keep It Clean
- Keep It Pest-Free
- Keep It Ventilated
- Keep It Safe
- Avoid Contaminants
- Maintain the House



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## Start With People







Why do we want homes that are clean and easily cleanable?

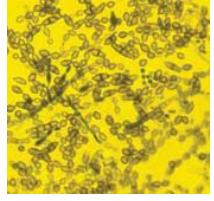



- Reduced exposure to:
  - Chemical contaminants
  - Allergens
  - Pest droppings and urine
  - Pesticides and consumer chemicals
  - Heavy metals such as lead and arsenic
- Reduced harborage for pests





Environmental Allergens

- Animals
- Dust Mites
- Molds
- Tree Pollen
- Grass Pollen
- Weed Pollen
- Latex
- Foods
- Stinging Insects
- Medications



Humid buildings may be colonized by dust mites. In dry climates dust mites are limited to porous materials that get humidified.





## Isolate Problems






Keep pets off beds and out of bedroom.






## What cleaning measures are problematic?

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




### Why Pest Free?



- Between 1980 and 1994, the prevalence of asthma increased 75% overall.
- Some pests are associated with asthma or asthma symptoms:
  - Dust mites
  - Cockroaches
  - Mice dander


Tphtc







### More Pesticide Information




- The method that we use to treat such pests may create human health hazards.
- 75% of US households have **used at least one pesticide indoors** during the last year.
- **Measurable levels of up to 12 pesticides** have been found in the air inside US homes.

Up to 80% of human exposure to pesticides in the US occurs indoors.

### Why Pesticide 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

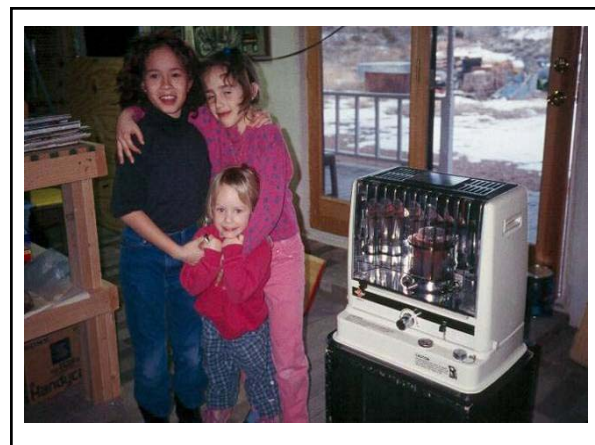
### Illegal and Risky Pesticides

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



## Integrated Pest Management (IPM)

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



## Sources of Combustion Contaminants

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



## Things that need exhaust ventilation

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









**AVOID CONTAMINANTS**








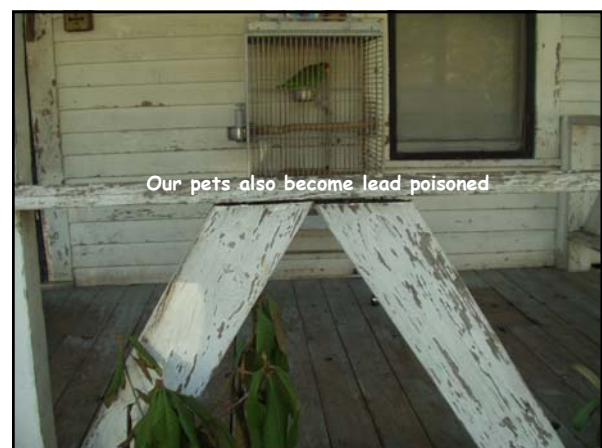
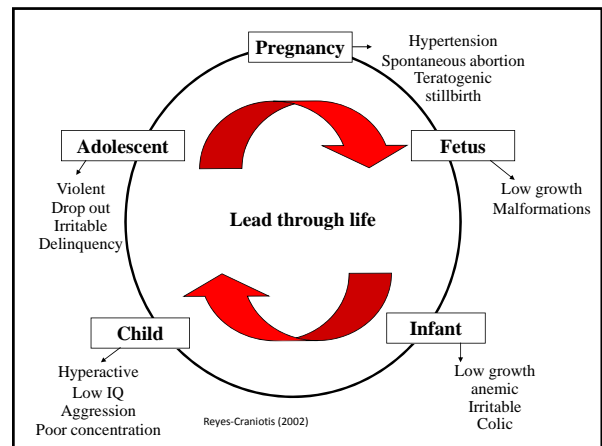
**Childhood lead poisoning**

A major preventable environmental health problem in the United States

Lead is a toxic metal that injures children starting even before birth



**75% OF US HOMES BUILT PRE 1978 CONTAIN SOME LEAD-BASED PAINT** HUD



## Lead Disclosure

- At property transfer, provide buyer/renter:
  - Lead warning statement
  - Summary of information on lead hazards (yes, no, don't know)
  - Documents on specific information about lead-based paint and lead hazards.
  - Tenant signature
- Rentals
  - Common Area results must be disclosed to all tenants.
  - At lease signing
  - Applies to oral leases.
  - Federal courses teach:



## Available Testing

- Paint chip
- Dust - Clearance testing
  - 40 micrograms of lead per square foot on floors
  - 250 micrograms of lead per square foot on window sills.
- Bare soil
  - 400 ppm in play areas
  - 1200 ppm in other areas
- Drinking water



## Asbestos



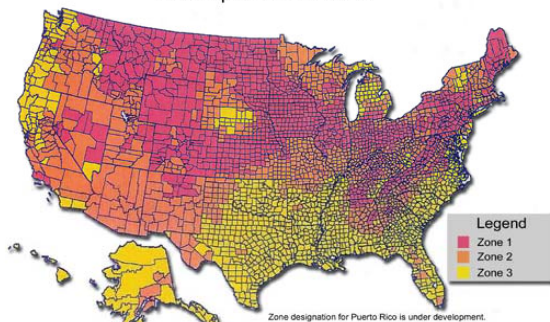
## Radon - A Serious Health Concern



- Radon is a naturally occurring gas produced by the breakdown of uranium and radium in ground.
- Radon
  - 2<sup>nd</sup> 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.



EPA Map of Radon Zones



Zone designation for Puerto Rico is under development.

Guam - Preliminary Zone Designation

IMPORTANT: Consult the EPA Map of Radon Zones document (EPA-402-R-93-011) before using this map. This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to better understand and predict the radon potential of a specific area.

## Volatile Organic Compounds

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



## Why Avoid ETS?

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.



## Non-smokers exposed to ETS have increase risk of acute & chronic disease



- Responsible for 150,000 to 300,000 lower respiratory tract infections in infants and children less than 18 months of age
- Asthma - cause and trigger
- Children affected by smoking caretaker
- 60% of US population has biological evidence of exposure to second hand smoke



## Maintain the House

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



On-going  
Seasonally  
Annually



## Check list for signs of possible indoor air quality problems

- **Observe** - cleanliness, mold, mildew, dirty central air conditioner, etc.
- **Smell** - mold, mildew, or chemical smell
- **Feel** - excessive humidity, drafts, uncomfortable temperatures
- **Listen** - concern of staff regarding indoor air quality, unusual noises



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National Healthy Homes Training Center

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