

A hand holding a paintbrush is shown in the upper left corner, painting a blue sky with white clouds. The paintbrush has a wooden handle and a black ferrule with white bristles. The background is a bright blue sky with soft, white clouds. The text is overlaid on this background.

Home Sweet Home or Home Sick Home: What are You Leaving Your Clients?

Cindy Ojczyk, LEED AP
Simply Green Design

BulletinboardForum.com

Healthy Homes in the News

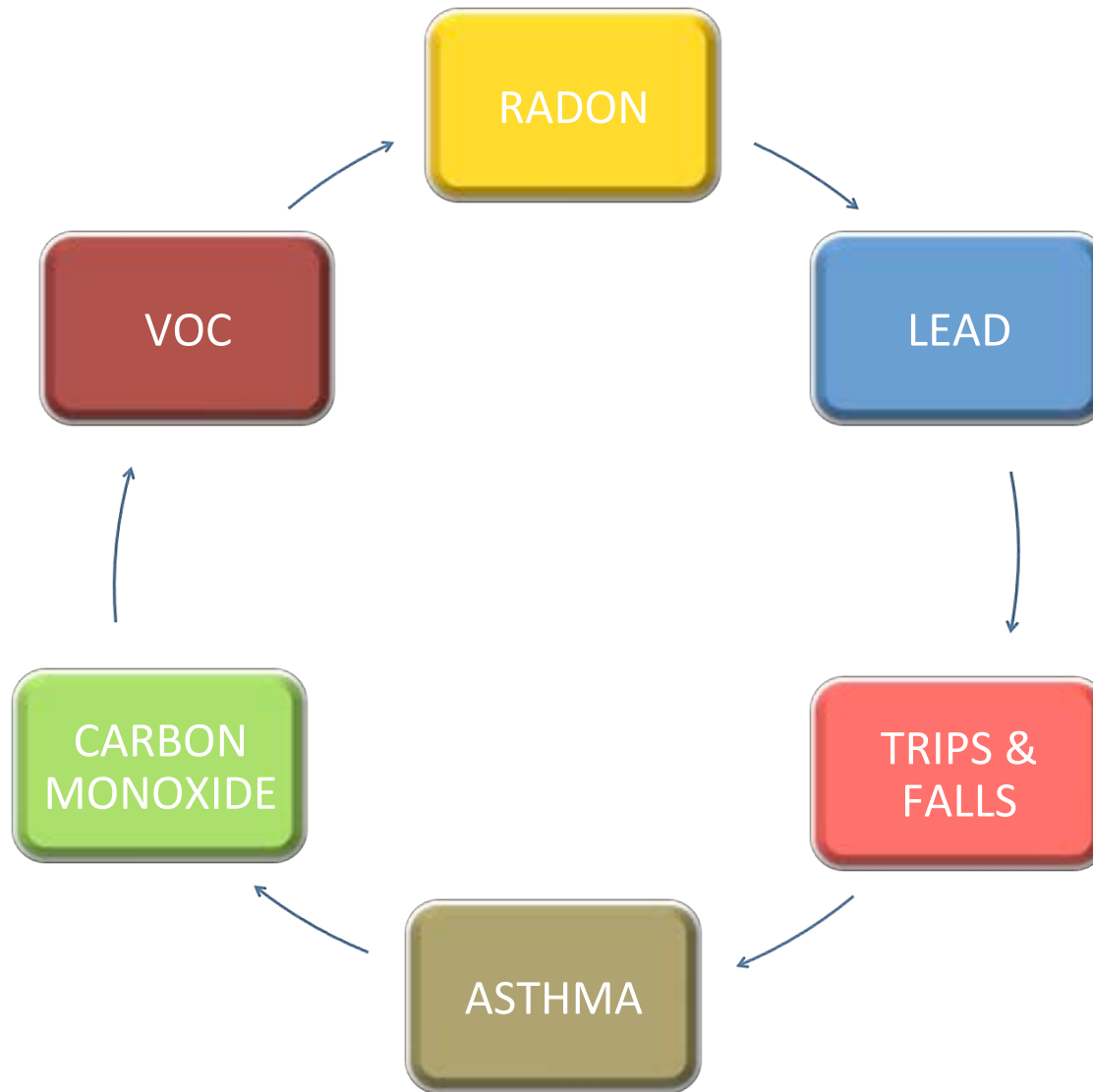


- ✓ Cleaning supplies and recipes to make your own
- ✓ Products: cabinets, paints/stains,
- ✓ Water filtration
- ✓ mold



15,000 emergency room visits for carbon monoxide poisoning
\$7.2 Billion per year for asthma linked to the home
\$18.5 Billion per year for trips and falls at home in 45-64 year olds
\$43 Billion per year to treat children with lead poisoning
20,000 lung cancer deaths per year linked to radon

PATHWAY TO HEALTHIER HOMES

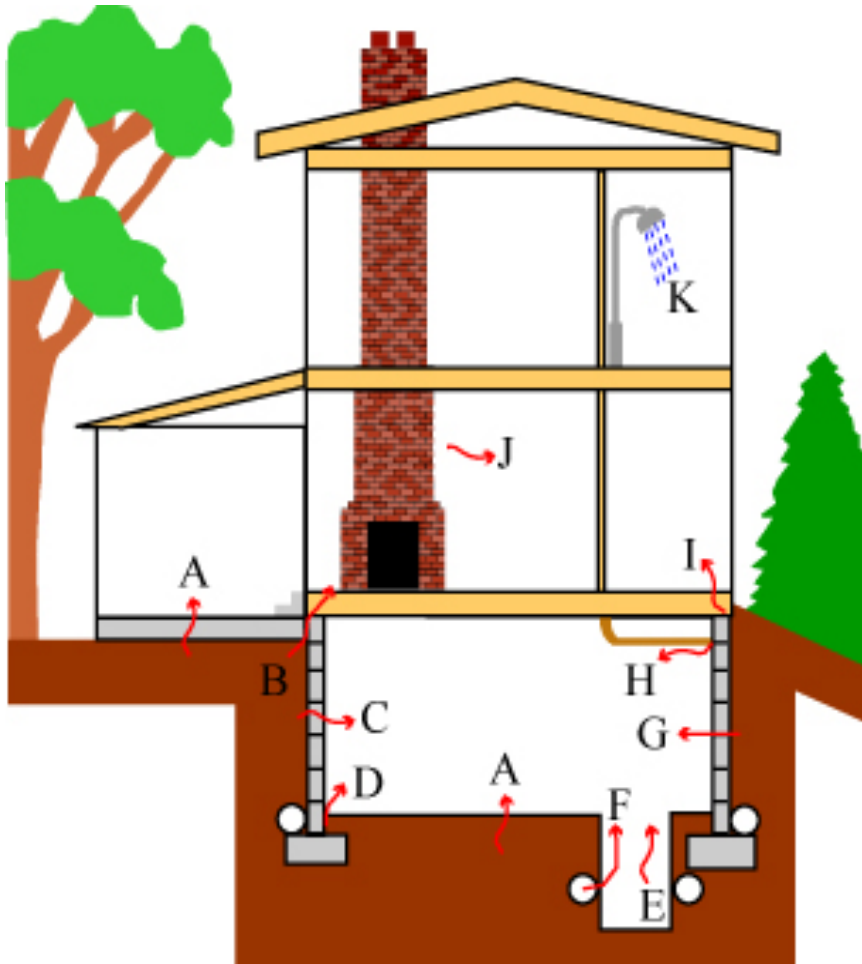




Radon

- Naturally occurring, odorless radioactive gas from minerals in soil
- # 1 cause lung cancer among non-smokers
- 1:3 homes in MN at elevated risk
- Mitigate at 4 pCi/L

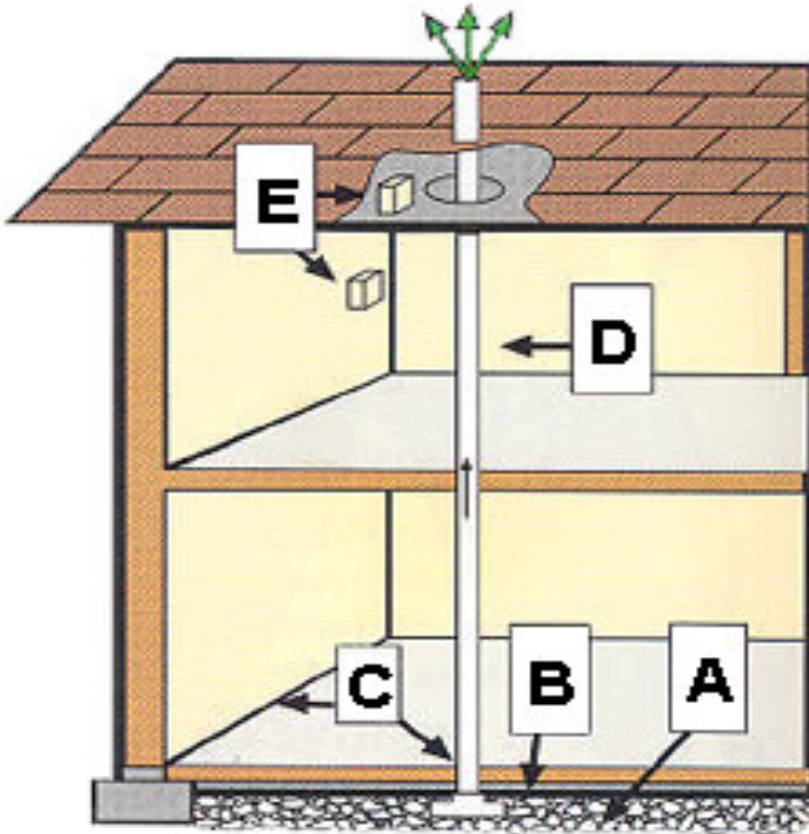
Radon: How It Gets into a Home



- A. Cracks in concrete slabs.
- B. Spaces behind brick veneer walls that rest on uncapped hollow-block foundations.
- C. Pores and cracks in concrete blocks.
- D. Floor-wall joints.
- E. Exposed soil, as in a sump or crawl space.
- F. Weeping (drain) tile, if drained to an open sump.
- G. Mortar joints.
- H. Loose fitting pipe penetrations.
- I. Open tops of block walls.
- J. Building materials, such as brick, concrete, rock.

Source: MN Dept. of Health

Radon: How to Reduce Risk



A: Gas Permeable Layer

B: Plastic Sheeting

C: Sealing and Caulking

D: Vent Pipe

E: Junction Box

Source: MN Dept. of Health

Radon Testing

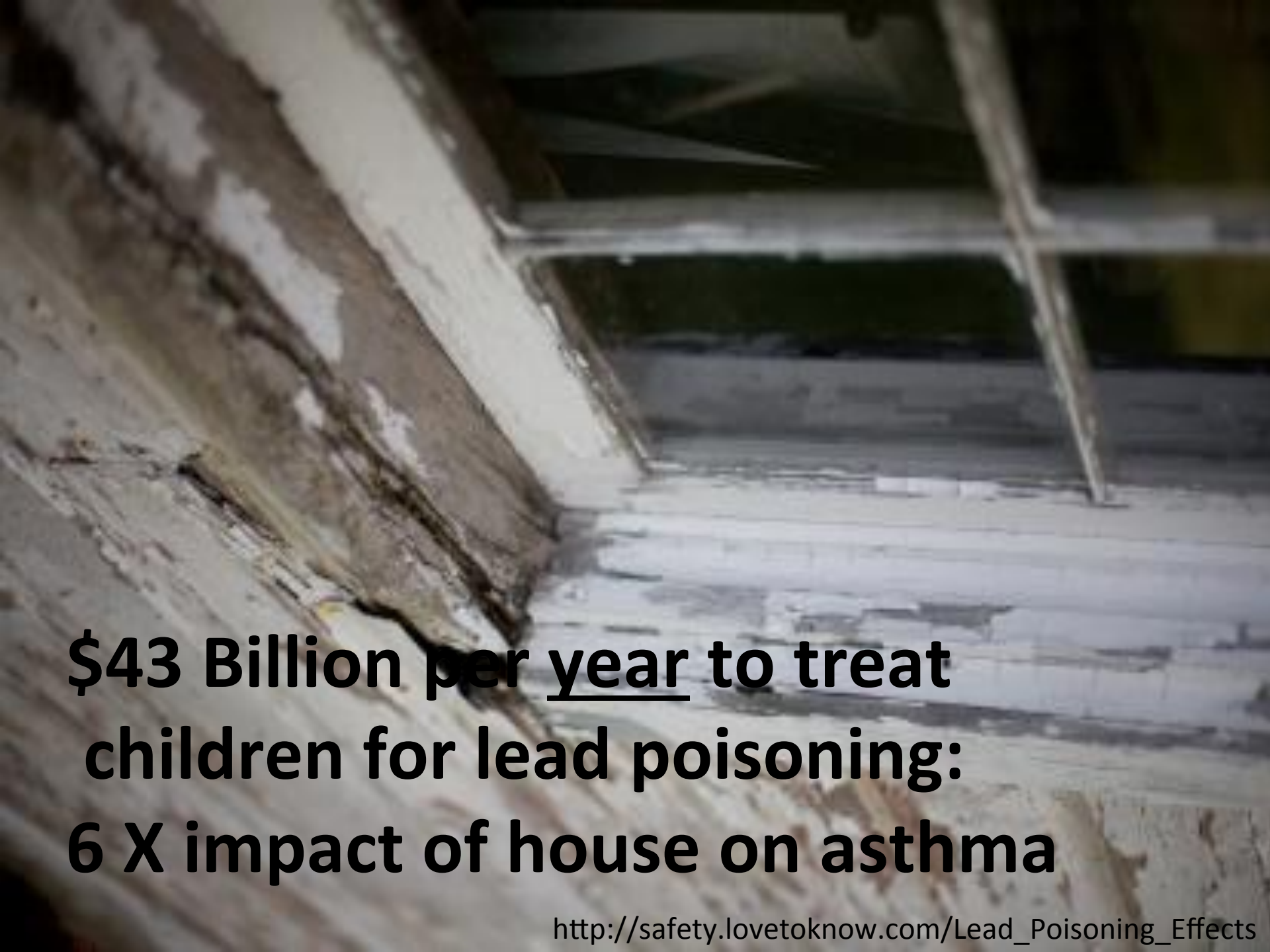
Radon Test Kit \$6.95

<http://www.radon.com/sub/mn>

Radon Mitigation

1. DIY (library reference materials)
2. DIY + Basic Assistance from Service Providers
(see MN Department of Health)
3. Certified Contractor (not state required)
 1. National Environmental Health Association
 2. National Radon Safety Board





**\$43 Billion per year to treat
children for lead poisoning:
6 X impact of house on asthma**

http://safety.lovetoknow.com/Lead_Poisoning_Effects



**Falls are leading cause
of home injury deaths
@ 33%**

**\$18.5 Billion annually
for falls/trips in 45-64
year olds (clients?)**

Safety Strategies

- ✓ Window safety guards
- ✓ Safety glass
- ✓ Hand rails
 - ✓ Bathroom
 - ✓ Stairs
- ✓ Proper stair tread/riser
- ✓ Lighting



Asthma

Development

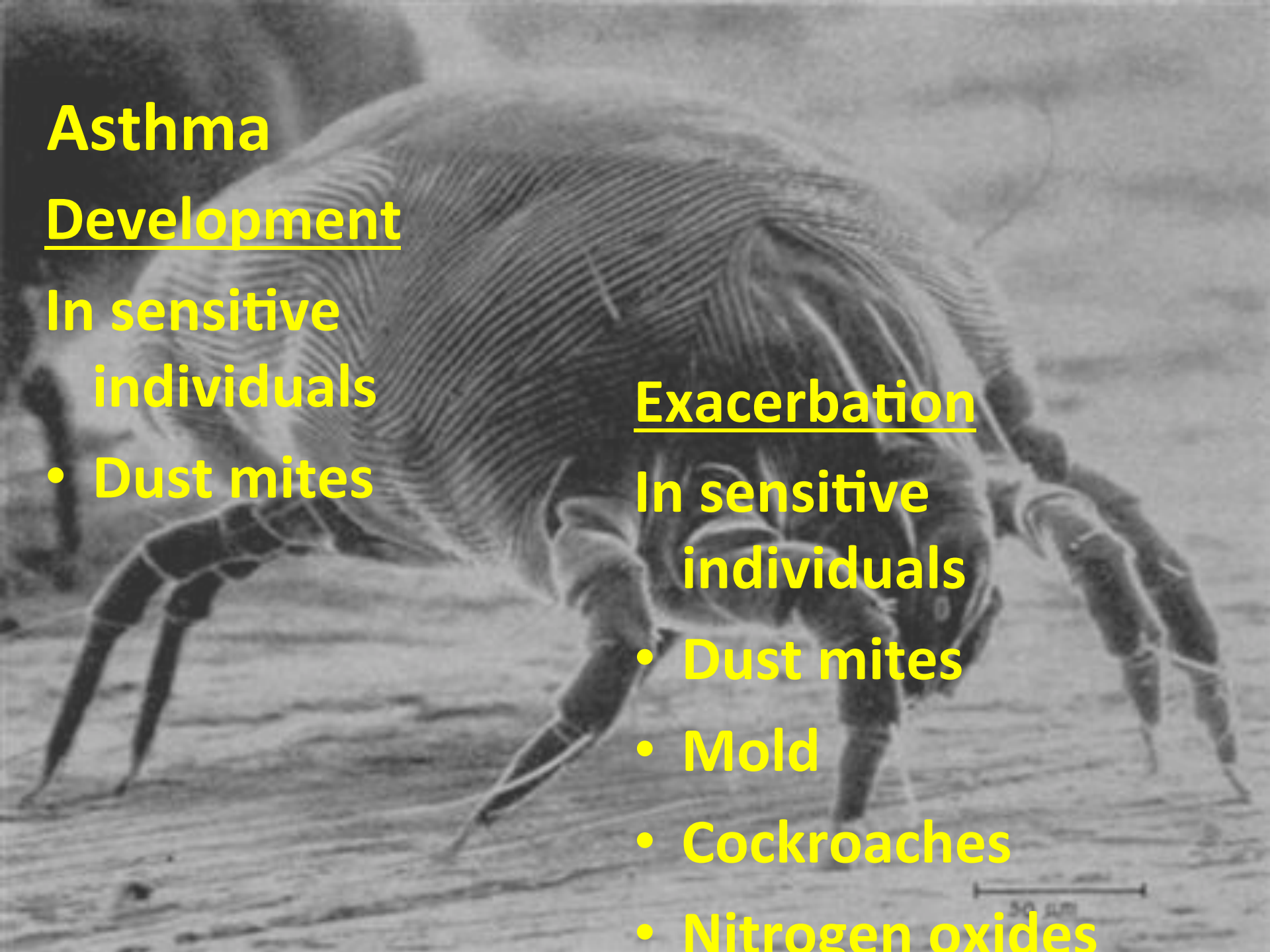
In sensitive individuals

- Dust mites

Exacerbation

In sensitive individuals

- Dust mites
- Mold
- Cockroaches
- Nitrogen oxides





natural linoleum with custom design

***The Relationship of Housing and
Population Health: A 30-Year
Retrospective Analysis (National Center
for Healthy Housing)***

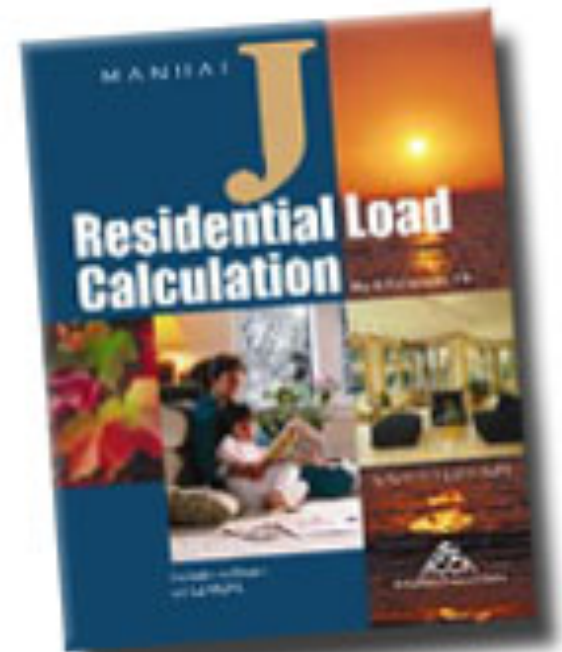
“Specifically, asthma has become more prevalent as more and more homes have central air conditioning and use forced air furnaces.”

Mold Reduction: Mechanical Systems

- **MANUAL J:** Air Conditioning Sized to the Load of a specific home

www.acca.org

- Water Heaters
 - Tankless
 - Drip pans or drains to catch water
- Hard surface flooring below grade

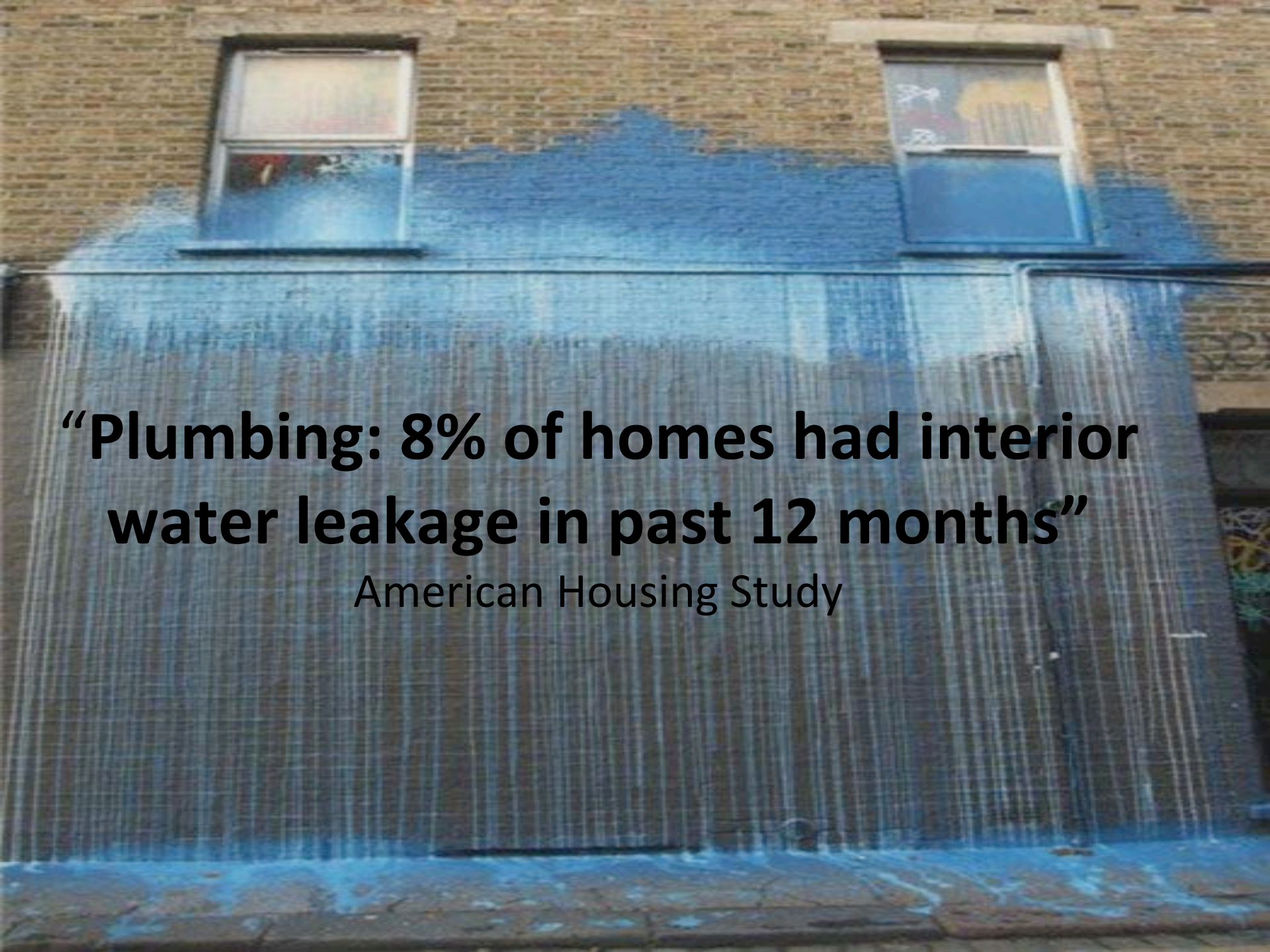


Mold Reduction: Point Source

- Seal vents/pipes leaving the building envelope
- Bath fans
 - Timers/sensors
 - Smooth duct
 - insulated
- Kitchen fans
- Clothes dryers
 - Smooth duct



PHOTO BY: Tim Carter, www.askthebuilder.com
(foam is not yet complete to show the smooth pipe and beginning stages of air sealing around pipe/roof intersection.)



“Plumbing: 8% of homes had interior water leakage in past 12 months”

American Housing Study



“10.3% of homes experienced exterior water leakage in past 12 months”

- American Housing Study

- ❖ Slope grade away from house**
- ❖ Gutters and downspouts**
- ❖ Fix roof leaks**

Mice can get through an opening the width of a pencil



Pest Barriers

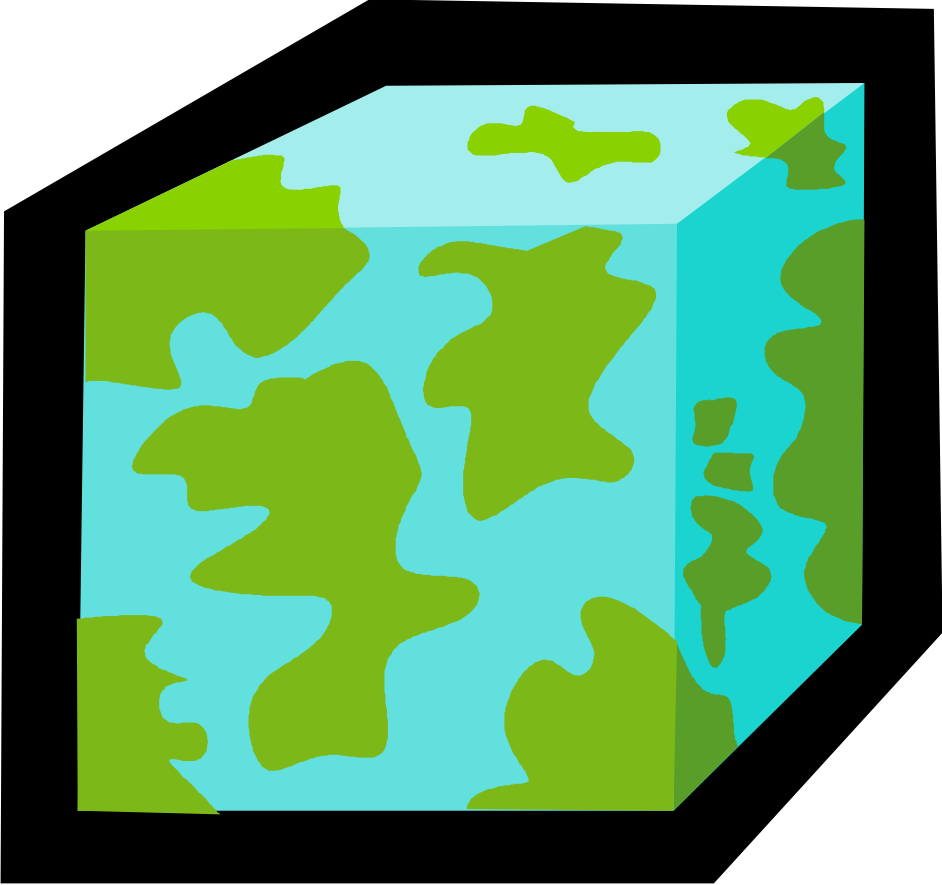


- Bulk water management
 - Landscaping
 - Gutters/downspouts away from foundation
 - Waterproof/damp proof foundation
 - Drain tile at footing – interior & exterior
 - Rain screen/air gap between siding and sheathing
- Caulk
- Vent screens





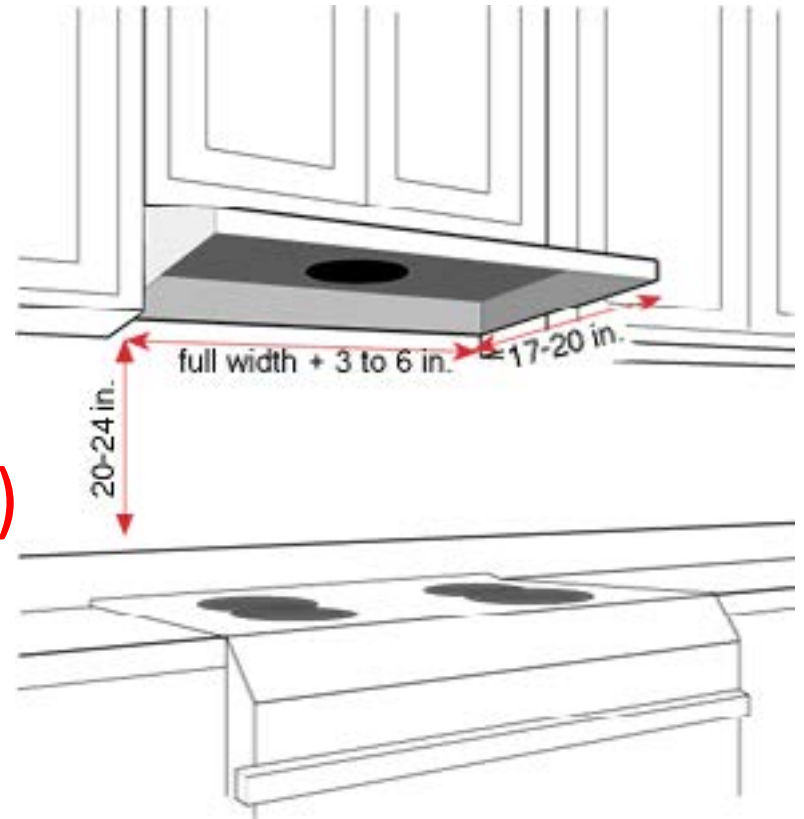
(Basketball = 9.39")



Nitrous Oxide & CO Reduction: Gas Cooking Appliances & Ventilation

Home Ventilating Institute:

- 40-50 cfm/1' range
= 120-150 cfm hood
(non-professional grade)
(150 cfm/1' – professional)
- Make-up air to prevent
CO backdraft from
Other appliances



Source: www.oikos.com

Carbon Monoxide

- Natural gas:
 - Furnace/boiler
 - Water heater
 - cooking
- Kerosene
 - Space heater
- Wood
 - fireplace
- Gasoline
 - Attached garages
 - Parking areas/roads

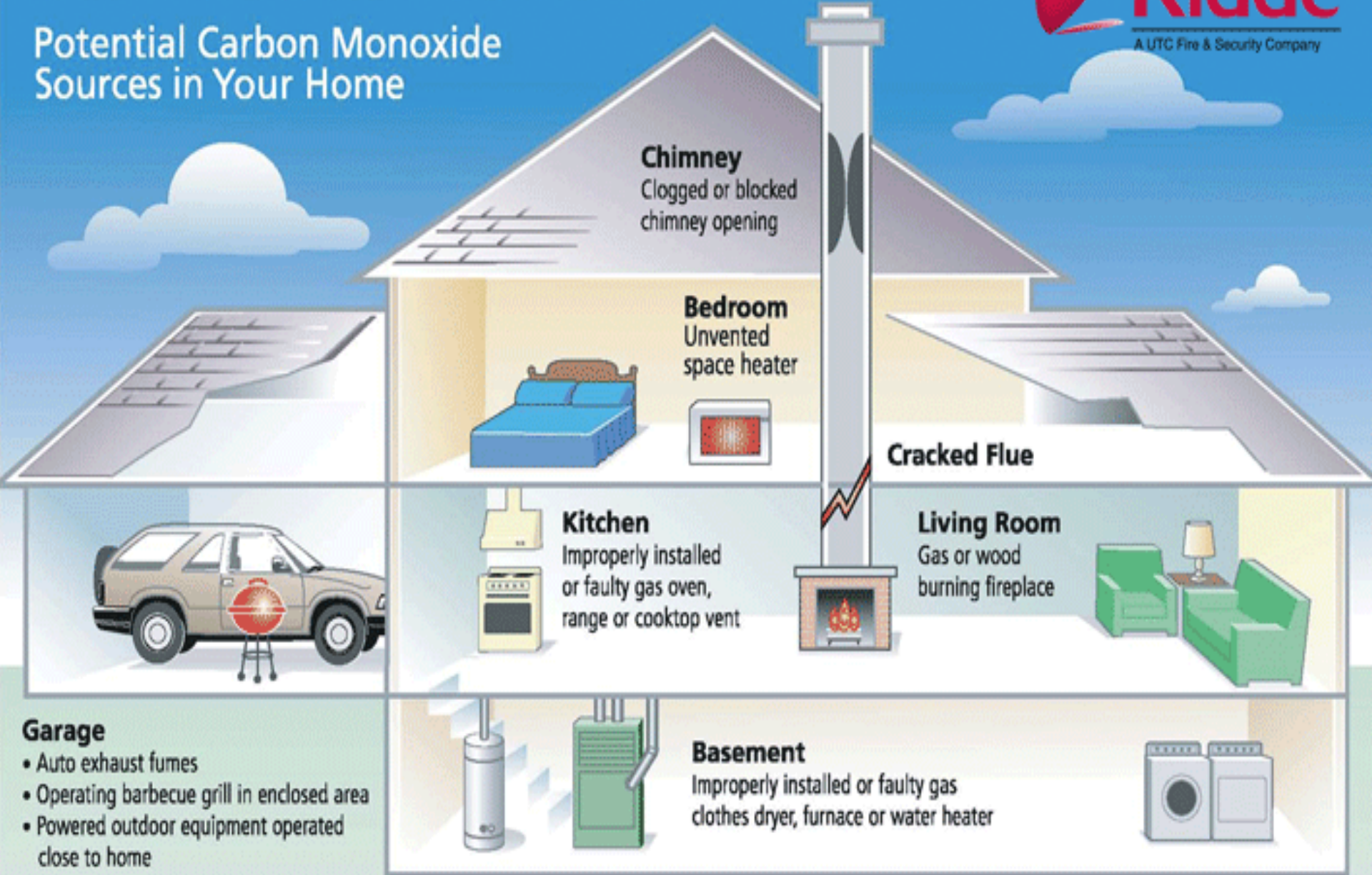
CO Impacts

Fatigue > chest pain (older adults) >
impaired vision > headaches >
reduced brain function >
nausea > death

Hispanic populations/**elderly** > black populations
> white populations

The Silent Killer

Potential Carbon Monoxide Sources in Your Home



CO Reduction: Garage Connections

- Air seal between garage wall/ceiling and conditioned walls of home
- Service door to home: automatic closer, gasket/weatherstrip
- Exhaust fan – continuous run
- Performance test for pressure differential
- CO detector
- <http://www.epa.gov/iaq/co.html>

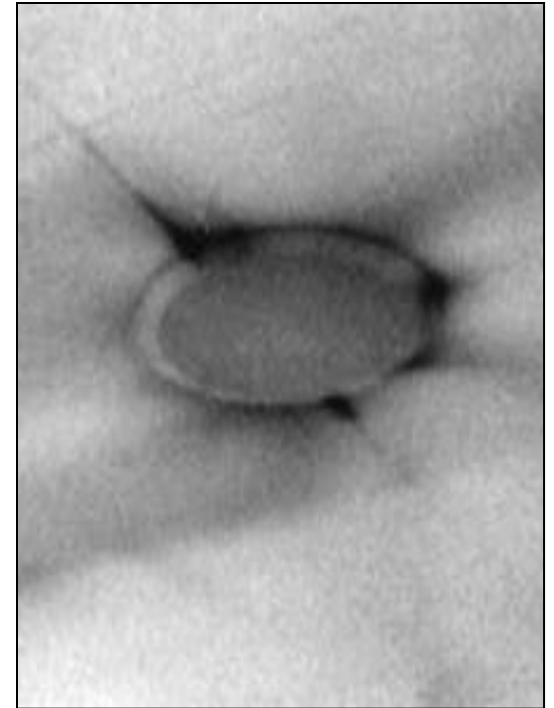
Performance Testing for Healthier Homes



Blower door



Infrared imaging



Performance Testing for Healthier Homes: Rater



Duct Blaster



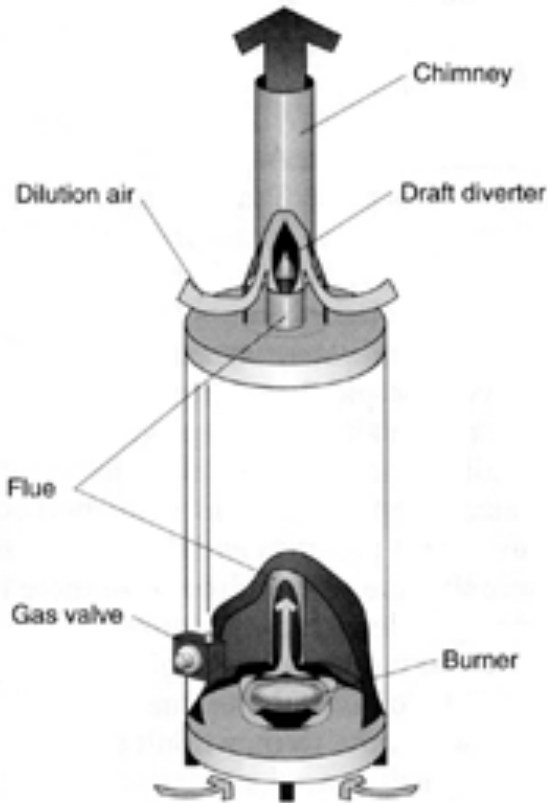
Balometer



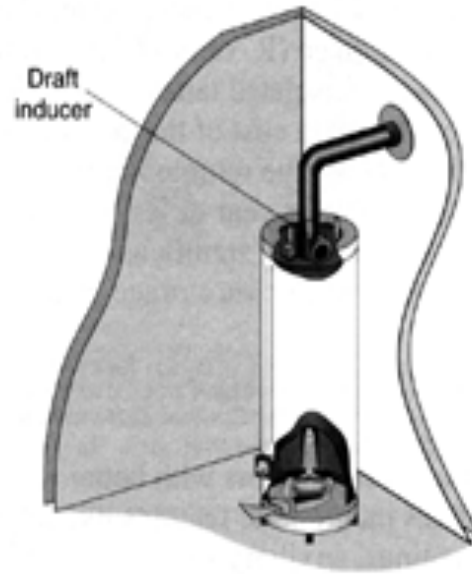
CO Testing

CO Reduction: Sealed Combustion, power vented appliances

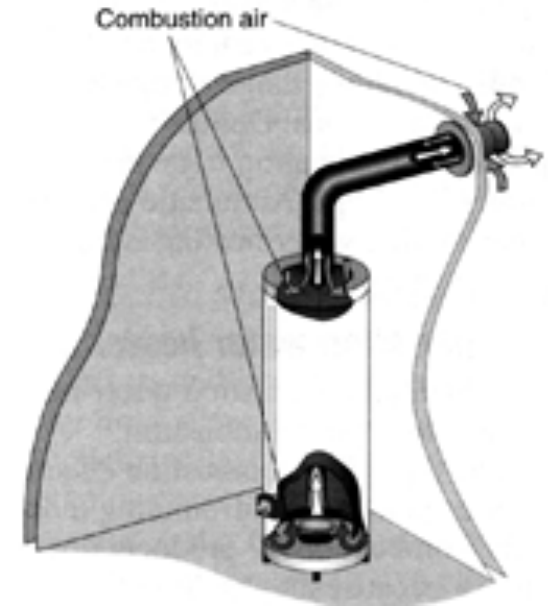
Standard Gas Water Heater



Induced-Draft Gas Water Heater



Atmospheric Sealed-Combustion Water Heater



Performance Testing for Healthier Homes: EPA Indoor airPLUS

- http://www.epa.gov/indoorairplus/building_professionals.html
- Checklist system that is extension of Energy Star Home program
- Requires a RESNET Energy rater to certify



Third-Party Low VOC Certifications That are Specific to a Product Category



www.greenseal.org
paints/primers



www.greenguard.org
variety

<http://www.rfci.com/index.htm>
Resilient & wood flooring

Green Label Plus: www.carpet-rug.org
Carpet/Padding
Adhesives



Other Considerations for Healthy Indoor Air Quality

- Appropriate material for location?
 - No carpet in wet areas: kitchens, bathrooms, entryways, basements
- Ability of low-emitting material to stay low-emitting:
 - Carpet: pet dander, dust/mites
 - Gypsum board with paper coating in presence of water

**Salvaged
Wood =>
Lead Paint**



Ventilation for Health and Comfort

- ASHRAE 62.2 guidelines
- Green Communities Criteria MN Overlay:
15 cfm fresh air per bedroom + 15 cfm
- Mechanical: HRV, ERV
- Exhaust Only

What Don't You See?



What Don't You See?



Time Out
For
Questions





**“A man generally has two
Reasons for doing a
thing: one that sounds
good, and a real one” –
J.P. Morgan**

**Do the REAL
Thing - Leave
Your Clients A
Healthy Home!**

Cindy Ojczyk