



Making the Connections Between Housing and Health




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Armand Magnelli

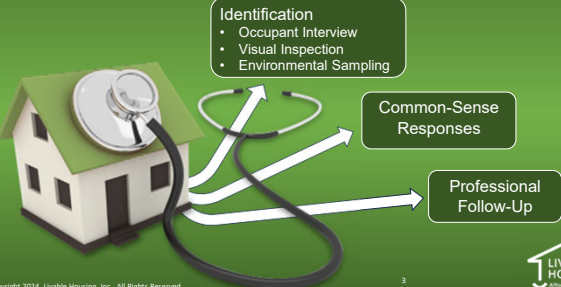
Armand has over 40 years of experience in sustainable construction, affordable housing and community development. Armand has managed production of a city-wide owner-occupied rehab program, and housing development for two Community Development Corporations, including 6 years as an Executive Director. In addition to his work as a practitioner, he has worked nationally as a consultant and trainer for over 30 years. Working with nonprofits and city governments, he provides training and technical assistance on Community Development, Affordable Housing Production, Disaster Preparedness and Recovery, Organizational Development, Volunteer Training and Management, and Healthy, Green, Resilient and Sustainable approaches to all of the above.

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Identification & Remediation




Identification

- Occupant Interview
- Visual Inspection
- Environmental Sampling

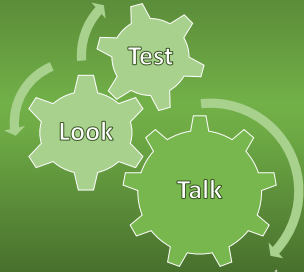
Common-Sense Responses

Professional Follow-Up



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Everything Starts & Ends with People



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Who's Most Vulnerable?



Image credit: From Frogtown: Photographs and Conversation in an Urban Neighborhood, 1993-1995

- Children
 - 70% of their time in home
- Elderly
- Pregnant/nursing
- Medically-underserved
- Poorly-nourished

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Let's Imagine Two Typical Households, and their potential housing issues:

The Jones Household

- Mrs. and Mr. Jones are in their 70s and retired
- Mr. Jones has difficulty with stairs
- Their two-story home was built in 1910
- Their son's two children, both under six, visit almost daily
- They have a damp basement and roof leaks

The Smith Household

- Ms. Smith is in her 30s
- She has a 4 year old son with Asthma
- Her two story, semi-detached home was built in 1948
- A portion of the home is built over a crawlspace, that has a dirt floor
- Their lot is sloped, with poor grading
- Her aunt, in her 60s, visits regularly to watch her son.

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Healthy Homes Principles

 1. Keep it DRY	 5. Keep it SAFE
 2. Keep it CLEAN	 6. Keep it CONTAMINANT-FREE
 3. Keep it VENTILATED	 7. Keep it MAINTAINED
 4. Keep it PEST-FREE	 8. Keep it THERMALLY-CONTROLLED

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Excess Moisture Leads to Problems

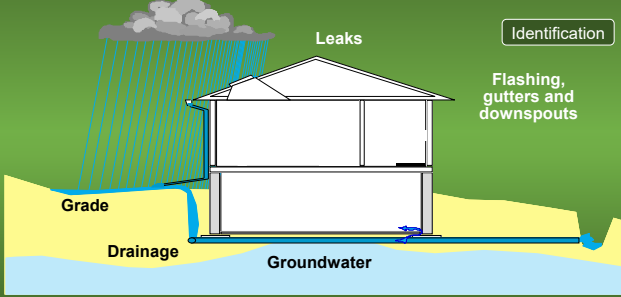


- Structural damage
- Deteriorated paint (LBP)
- Mold
- Pests

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Stop Liquid Water Entry First



Leaks **Identification**

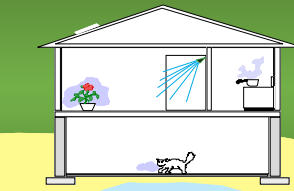
Grade **Drainage** **Groundwater**

Flashing, gutters and downspouts

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Moisture Generated by Activities

Identification



- Cooking
- Bathing
- Plants
- Perspiration
- Respiration
- Laundry


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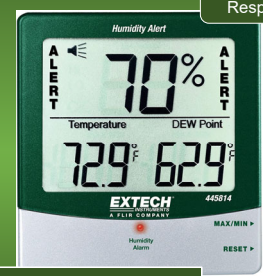
How Wet Is It?

Moisture Meter

Identification

Common-Sense Responses





Thermo-Hygrometer

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Where Does House Dust Come From?

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



Identification

Common-Sense Responses

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Making Buildings More Cleanable

- Focus on horizontal surfaces
 - Floors
 - Carpet = evil
- Effective storage
- Educate the residents



Identification

Common-Sense Responses

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Why Ventilate?

- Indoor Air Quality**
 - Bathrooms
 - Kitchens
 - Clothes Dryers
- Combustion Contaminants**
 - Gas ranges & ovens
 - Boiler, furnace, water heater
 - Fireplace, wood-burning stove
 - Car exhaust from attached garage


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Local Ventilation: Kitchen


- Remove moisture, odors, grease, particles PM2.5
- If gas oven or range, remove products of combustion: Moisture, CO, NO2
- Must be vented to the outside
- If it is not reasonably quiet, many people will not use it

Identification




Common-Sense Responses

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Local Ventilation: Bath

Ventilated also helps to Keep it Dry



Common-Sense Responses



Hot, humid air for the attic?

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Our Recommendations

- Bathroom with tub/shower - minimum 80 CFM fan vented outside with a time delay of 20 minutes
- Half-baths - 50 CFM & no time delay
- Kitchens - minimum 150 CFM fan vented outside.
- Clothes dryers must vent to the outside.
- Seal all air leaks between attached garage & the house

Common-Sense Responses

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Healthy Homes Principles


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Health Effects of Pests

- Asthma
- Infectious diseases
- Pesticide poisoning (people)
- Contaminate food
- Loss of sleep
- Health effects greater on children

Pests violate Housing Codes



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Signs of Pests

Identification

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Frass

Identification

Door

Behind wallpaper

Wall clock

Under a cabinet shelf

Behind the wall clock

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Integrated Pest Management (IPM)

Common-Sense Responses


Professional Follow-Up

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Cockroach Control

- Exclusion
- Habitat modification
- Dust and caulk
- Baits and gels
- Insect growth regulators
- Sticky traps as monitors



Identification

Common-Sense Responses

Professional Follow-Up

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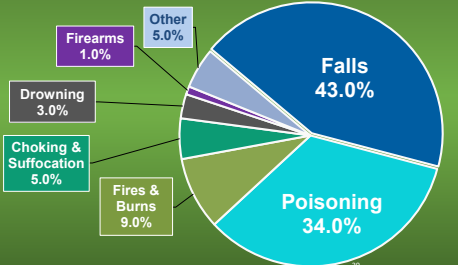
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The Most Common Causes of Home Injury Deaths



Cause	Percentage
Falls	43.0%
Poisoning	34.0%
Fires & Burns	9.0%
Choking & Suffocation	5.0%
Other	5.0%
Drowning	3.0%
Firearms	1.0%

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Causes of child injury and prevention tips

www.cdc.gov/vitalsigns
Your Source for Credible Health Information

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Total Deaths: 9,143

Cause	Deaths	Percentage
Motor Vehicle	4,564	41%
Suffocation	1,160	30%
Drowning	983	28%
Poisoning	824	80%
Fire/burn	391	45%
Fall	151	19%

Motor Vehicle: Always use car seats, child safety seats and booster seats that are correct for a child's age and weight. Use appropriate equipment or contacts with belts.

Suffocation: Make sure babies sleep alone, placed on their backs on a firm surface. No toys or items with loose parts. Avoid loose bedding in cribs, beds or cots.

Drowning: Learn to swim - instruction for parents and kids. Lock your child from swimming pool and surrounding areas around pool. Make sure there are life rings and rescue tools.

Poisoning: Keep medicines away from children and teens. Make medicines and other toxic products in original packaging and when children can't get them.

Fire/burn: Don't smoke in cars - when inside sleep only on every level of the house, and not nearby. Cover and practice a family fire escape plan. Install a home fire smoke alarm regularly.

Fall: Use a soft landing surface in playgrounds, yards and at school events, and all fall areas. Use playground gear that is tested, built to last and inspected. Use proper safety rules on trampoline and soft lands.

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Window Safety Guard

Identification

Common-Sense Responses

Safety Glass

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Avoid Poisoning

- **82%** of households keep medicines in unlocked drawers or cabinets.
- **69%** of homes with young children store household chemicals in unlocked areas.

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Identification



Common-Sense Responses

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Fall Prevention

- Good lighting
- Indoors and out
- 3-way switches
- Handrails
- Well-designed stairs
- Ramps
- Grab bars
- No tripping hazards

Common-Sense Responses



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Fire & Combustion Safety



Identification



Common-Sense Responses

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Volatile Organic Compounds (VOC)

- Cleaning & Disinfecting
- Paints, Sprays, Coatings
- Building Products
- Hobbies

Identification





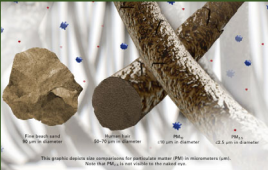
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Indoor Air Quality (IAQ)

We have the technology to measure contaminants in the air. If we don't measure we don't know.

- Radon
- CO
- Particulate PM 2.5 & PM 0.5
- VOCs
- NO_x
- CO₂

Identification





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Potential Health Effects of ETS



Children

- Causes premature death and disease in children

Adults

- Immediate adverse effects on the cardiovascular system and causes coronary heart disease and lung cancer

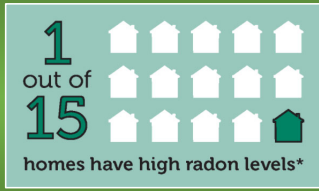
60% of US population has biological evidence of exposure



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Radon – A Serious Health Concern



- Odorless, colorless, naturally-occurring gas
- The 2nd leading cause of lung cancer after smoking
- Leading cause of lung cancer in nonsmokers



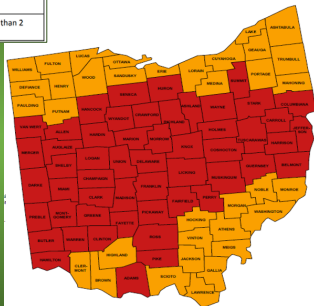
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■ Zone 1 (red zones)	Highest potential; average indoor radon levels may be greater than 4 pCi/L (picocuries per liter)
■ Zone 2 (orange zones)	Moderate potential; average indoor radon levels may be between 2 and 4 pCi/L.
■ Zone 3 (yellow zones)	Low potential; average indoor radon levels may be less than 2 pCi/L.

OHIO EPA Radon Zones

- Average levels are high
- We don't know if we don't test



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Free Radon Test Kits for Homeowners

Radon is the number one cause of lung cancer for non-smokers and the second leading cause of lung cancer in smokers.

You can reduce radon levels, but the only way to know if your home has high radon levels is to test.

Free radon test kits are available for Ohio homeowners. Order your FREE test kit now.

Radon can be reduced with a mitigation system. Use this link to find a **radon mitigation contractor** licensed in Ohio: [Find a Licensed Radon Contractor](#).

<https://ohio.radon.com/>

Ohio | Department of Health

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Our Recommendations

- Test for radon & remediate
- Reduce VOCs and asthma triggers
- Prevent mold/control moisture
- Keep homes and cars smoke-free
- Install 10-yr carbon monoxide (CO) alarms and smoke detectors
- Use and properly maintain the ventilation system

Identification | Common-Sense Responses

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Sometimes, residents intentionally introduce contaminants because of a function the contaminant provides.

What contaminants have you seen residents use in their homes?

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Legacy Toxins





Identification

Professional
Follow-Up



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Why Avoid Lead?

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




Identification

Professional
Follow-Up

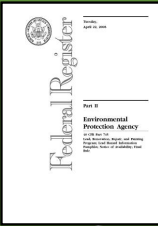


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EPA Renovation, Repair and Painting (RRP) Rule

- 8.4 million renovation events annually
- Effective in 2010
 - Pre-1978 housing
 - Certification of Firms & Renovators
 - Mandatory Work Practices
 - Cleaning & Verification
 - Documentation
- Triggers
 - Compensation
 - Disturbing paint

- Identification
- Common-Sense Responses
- Professional Follow-Up



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