American Lung Association.

Invisible Risks: Addressing indoor air quality among patients

November 12, 2025

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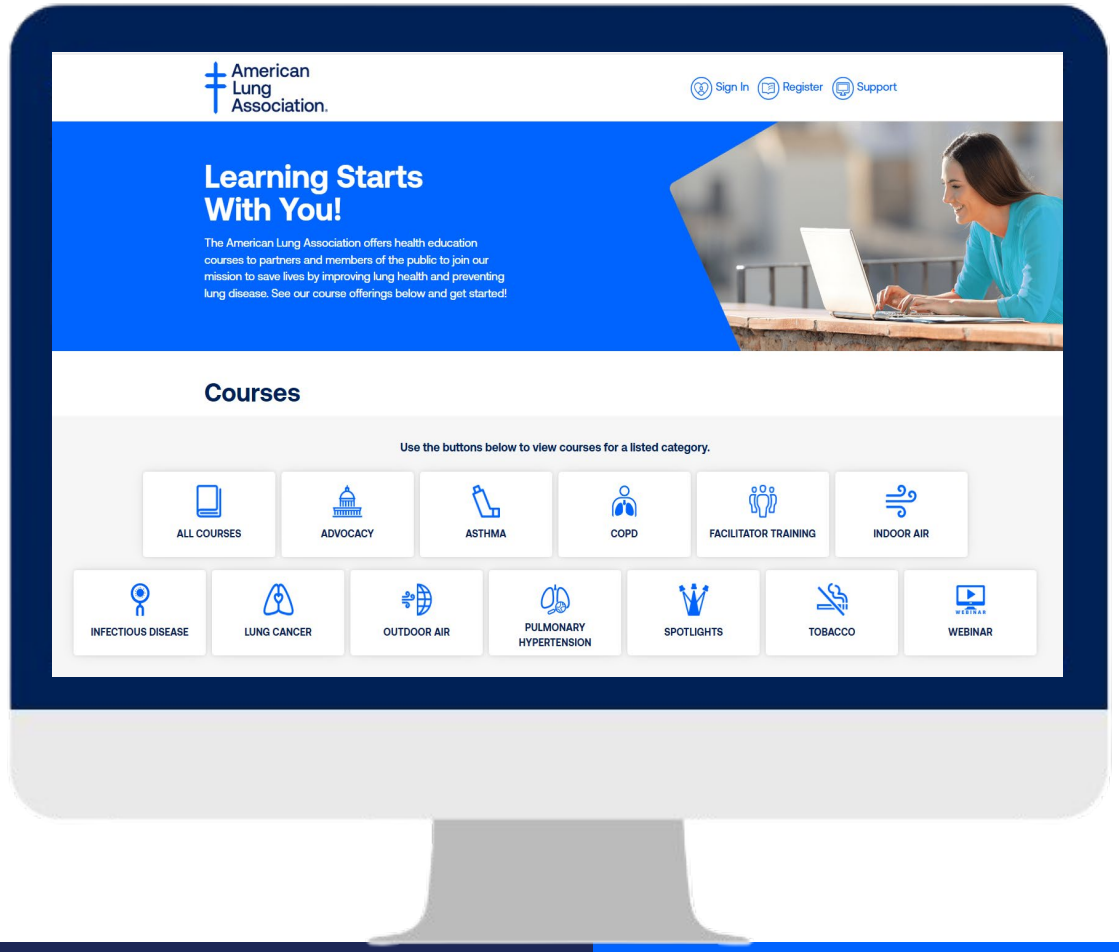
American Lung Association.

Health Education Courses



Featured Courses:

- Invisible Risks: the Health Impacts of Indoor A Quality
- Asthma Management Guidelines: A Review fo Healthcare Professionals
- Climate and Health Basics
- Radon Basics
- Asthma Basics
- COPD Basics
- And, much more!

Register at:

Lung.Training

Learning Objectives

1. Explain why indoor air quality is a serious public health issue.
2. Explain how indoor air quality impacts the body and health.
3. Determine which patients are at most risk for poor indoor air quality.
4. Identify the health risks of commonly occurring indoor air pollutants.
5. Learn how to assess patients for exposure to indoor air pollutants.
6. Understand how to develop an indoor air quality action plan with patients.

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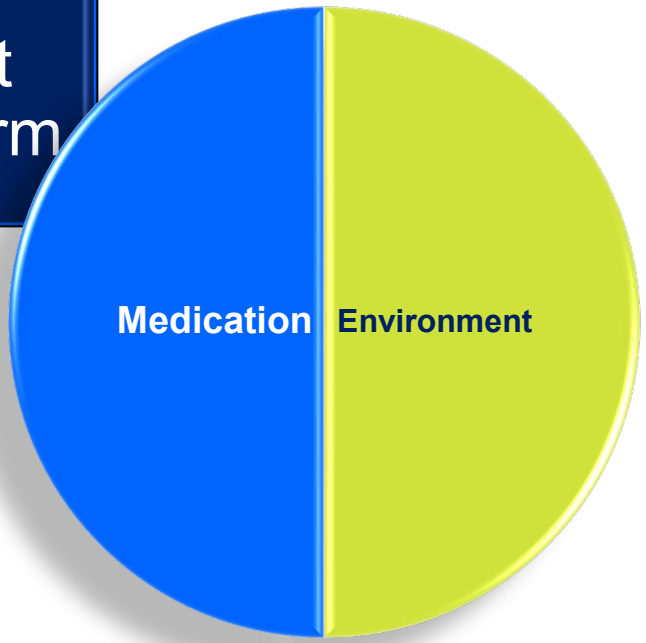
Why should you know about IAQ?

You are a trusted source of information

People with asthma, COPD or lung cancer are most susceptible to harm

Early identification and intervention are key



How can the home/work/school environmental conditions of a patient be addressed in the clinical setting?

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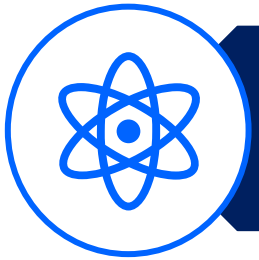
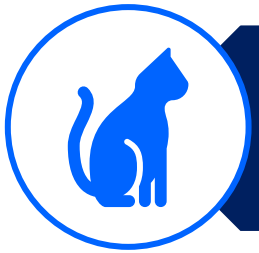
Indoor Air Pollutants

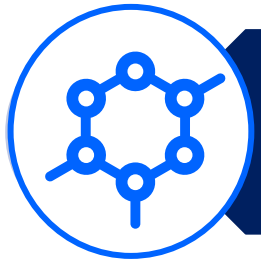


Gas pollutants
(CO, CO_2, NO, **Radon**)



Biological pollutants
(mold, pests, pets, bacteria, viruses)

Particulate Matter (PM)
(dust, cooking fumes, smoke, aerosols)



Volatile Organic Compounds (VOC)
(chemicals)

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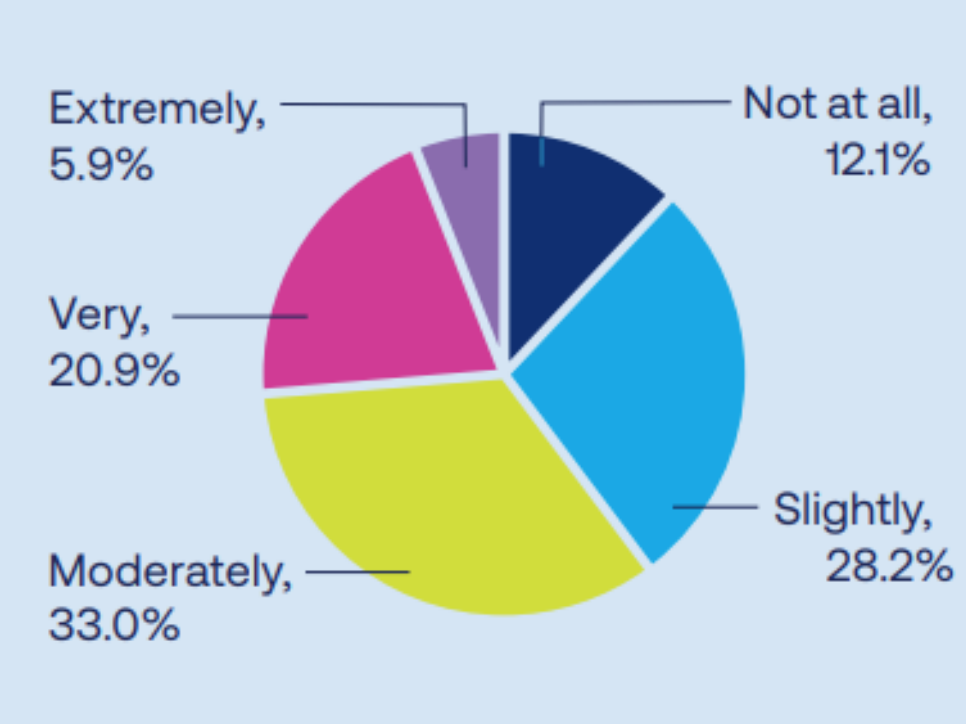
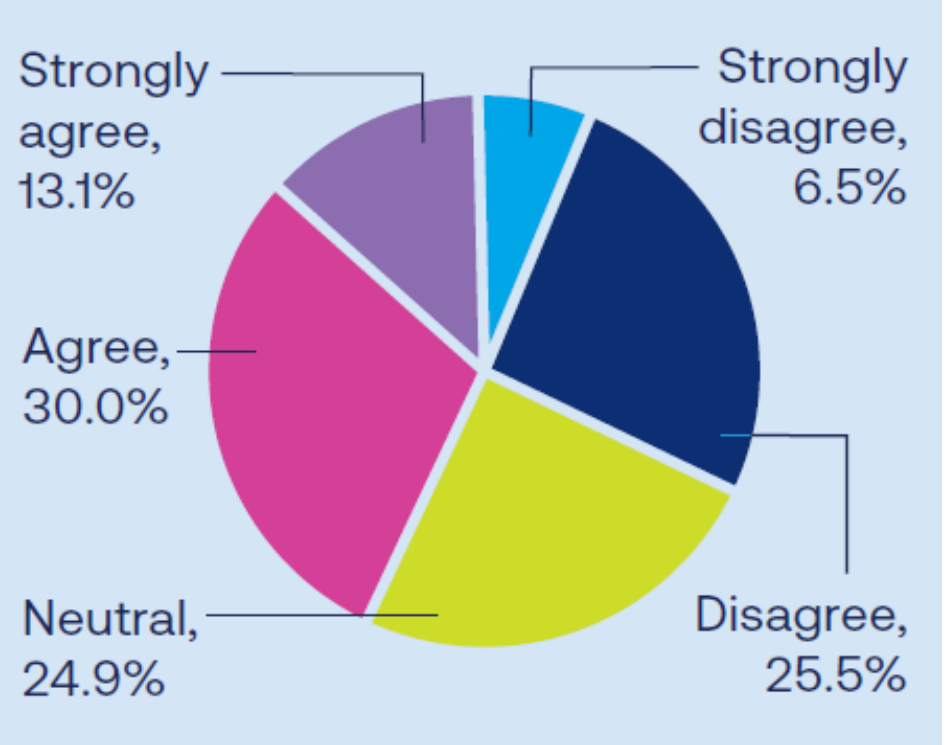
BELIEFS

How satisfied are you with your current knowledge of the health effects of IAP?



Only **1** in **4** are satisfied with their current knowledge of the health effects of indoor air pollution.

I feel well-prepared to discuss the health impacts from IAP with my patients



3 in **5** HCPs do not feel well-prepared to discuss the health impacts from indoor air pollution with patients.

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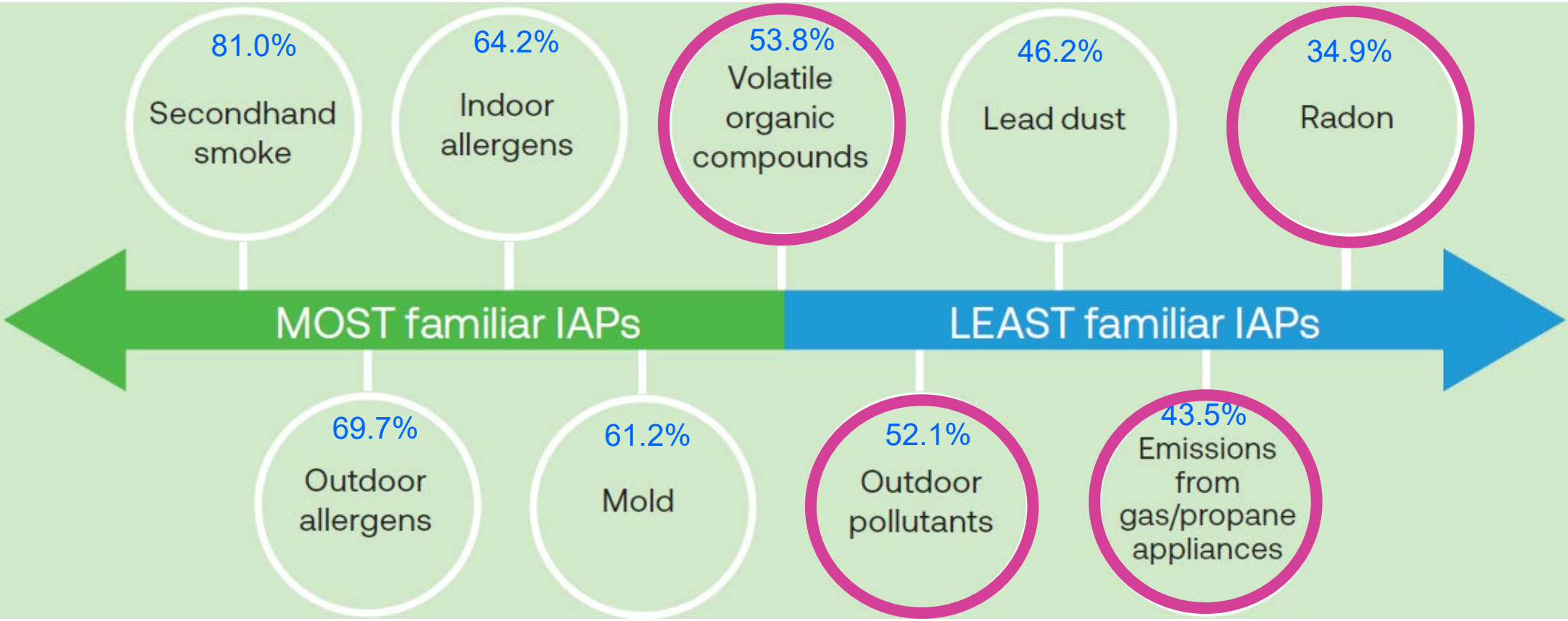
KNOWLEDGE



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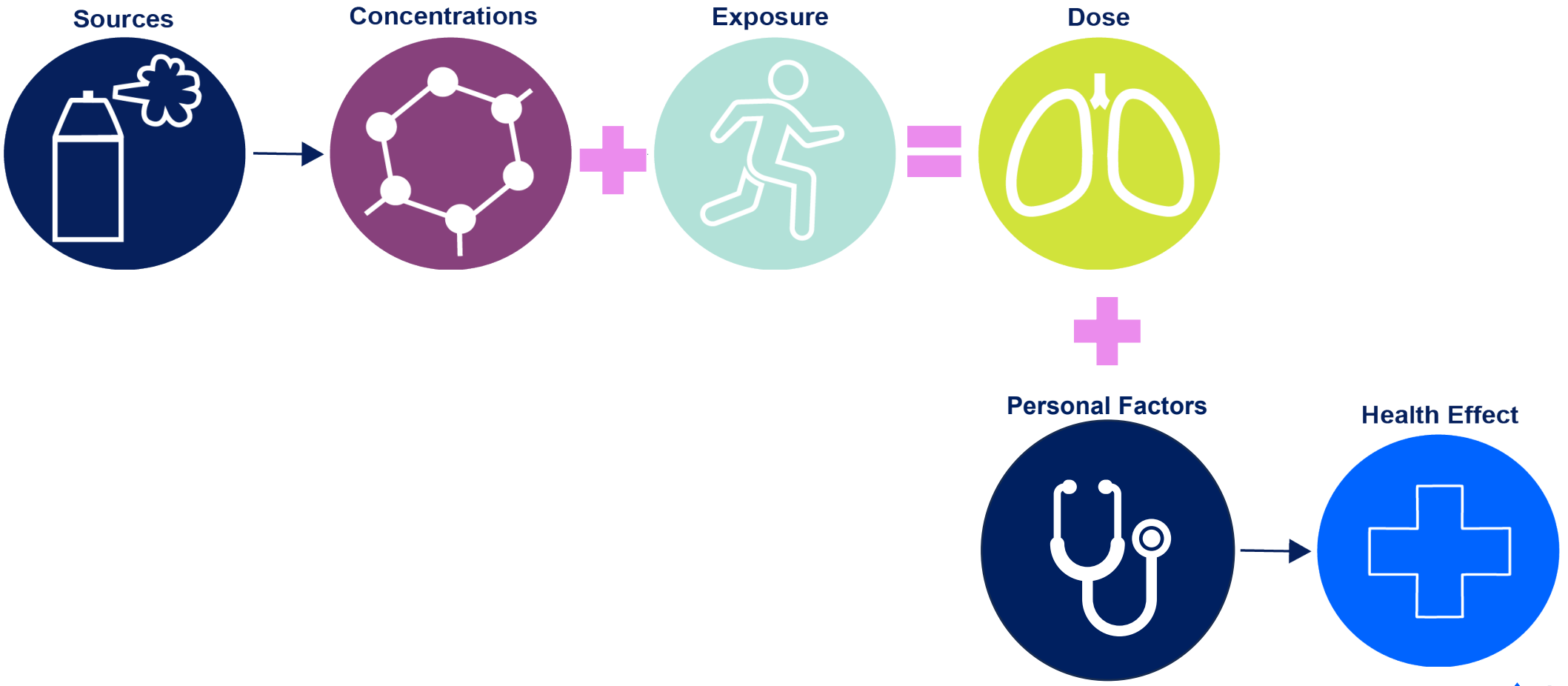
It Is All About the Concentration + Exposure = Dose



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Vulnerable Populations, *cont'd…*

Some communities impacted more by air pollution because they are more likely to:

- Live in sub-standard housing
- Live closer to pollution-producing sources
- Have higher risk of chronic disease

→

- More missed days of school and work
- Financial strain of medical costs associated with hospitalizations and ER visits

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Improving Indoor Air Quality: The 3 Step Approach

1. Source Control	• Eliminate or reduce the source of pollutant(s)
2. Ventilation	• Increase ventilation to dilute pollutant(s)
3. Air Cleaning	• Clean the air to capture pollutant(s)

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Radon

What is it | Health Impacts| Assessing | Educating

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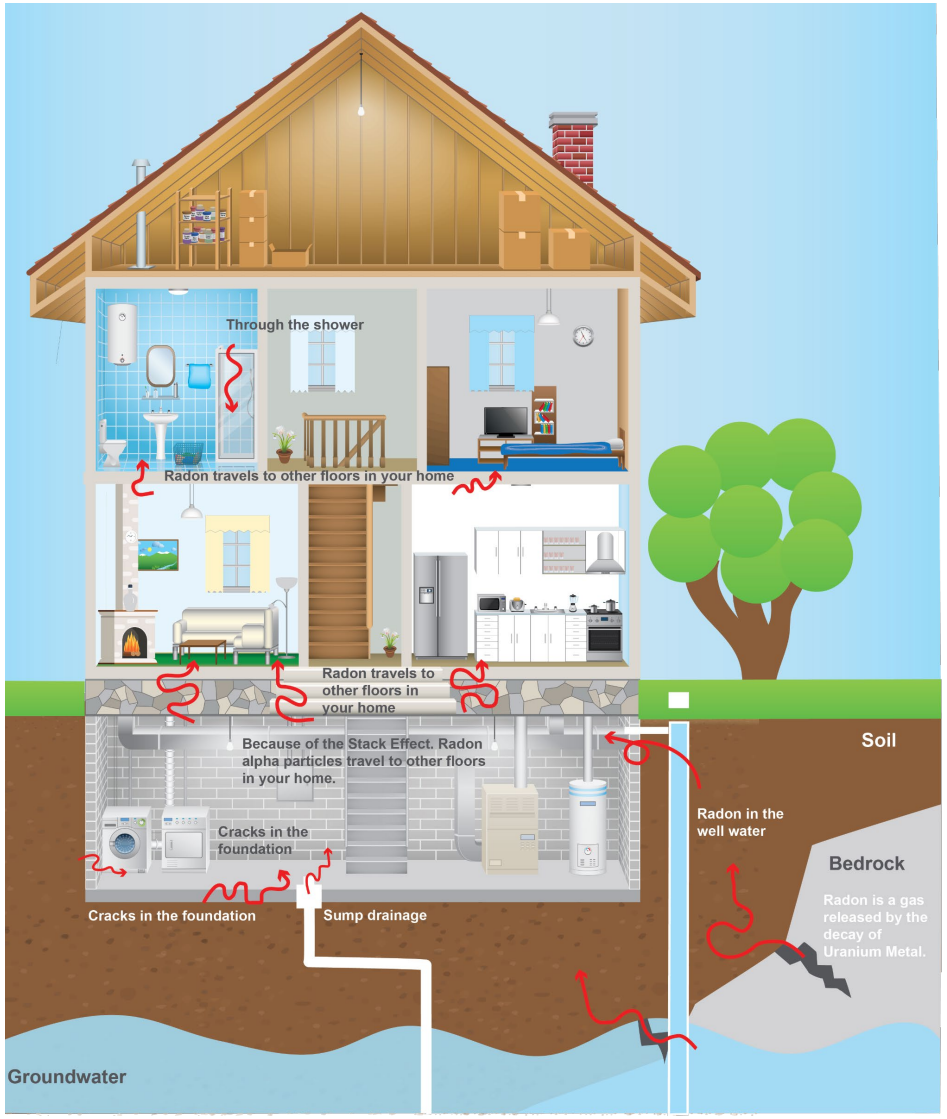
What is Radon?

Radon is:

- Naturally occurring, radioactive gas.
- Odorless, colorless, tasteless, invisible.

Where does radon come from?



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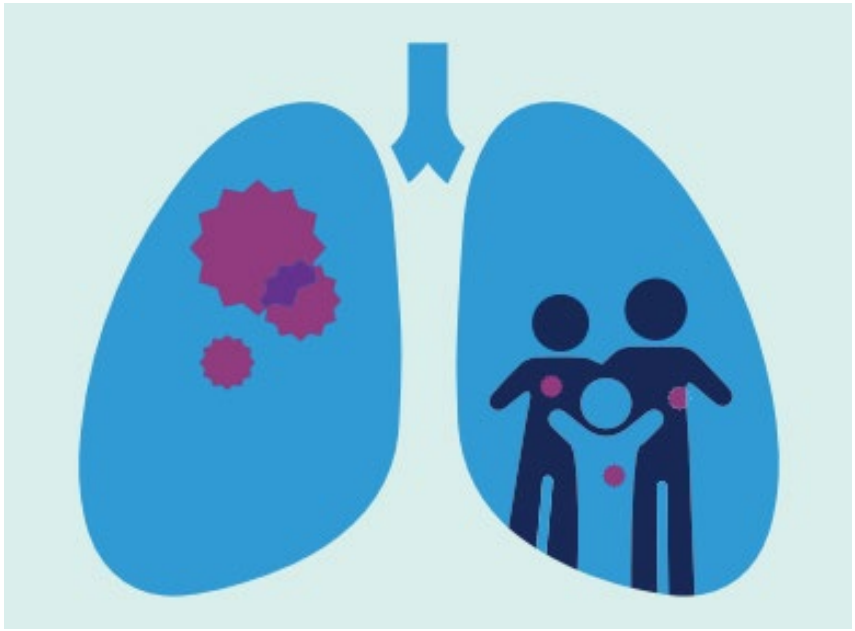
Health Impacts of Radon



- Once inhaled, radon decays further and releases **radioactive particles** that penetrate the lining of the lungs and can **damage lung tissue** over time.
- Radon is the **second leading cause of lung cancer**
- Responsible for **21,000 deaths each year**

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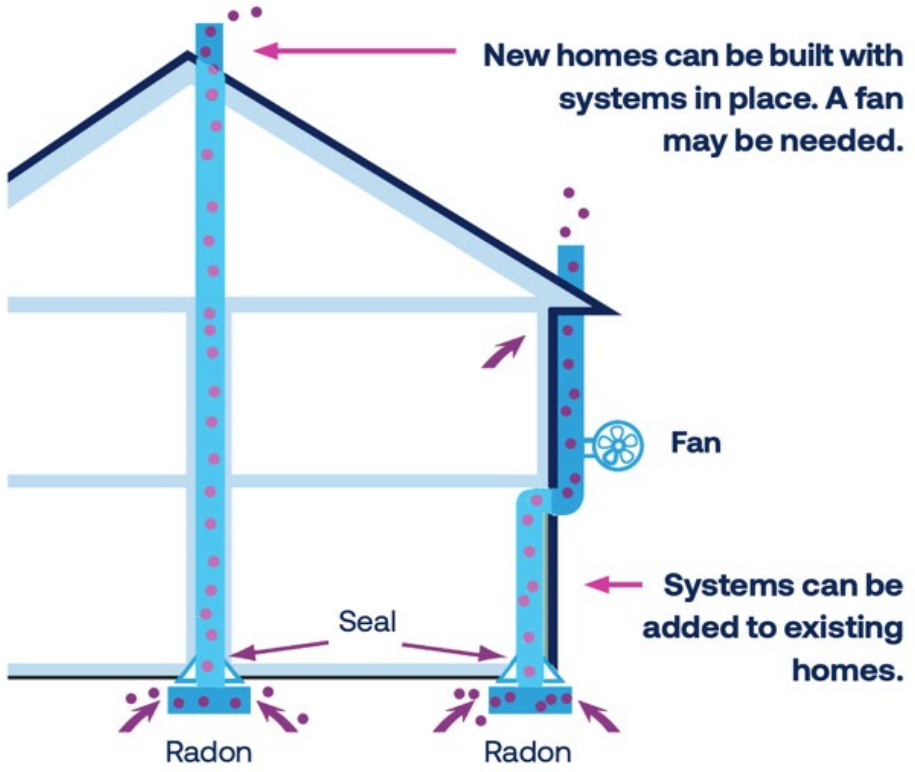
Radon: Assessing & Addressing Exposure

The only way to detect a radon problem is to test for it!

- ≥ 4.0 picocuries per liter (pCi/L) = mitigation suggested
- New home buyers
- Smokers
- Pregnant women
- New parents



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Particulate Matter

What is it | Health Impacts | Assessing | Educating

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What is Particulate Matter (PM)?

- Ubiquitous, ever-changing, affects everyone
- Mixture of solid particles and liquid droplets
- Can be manmade or natural
- Particles can be many shapes and sizes
- Size matters
  - $PM_{10} > PM_{2.5} >$ Ultrafine particles

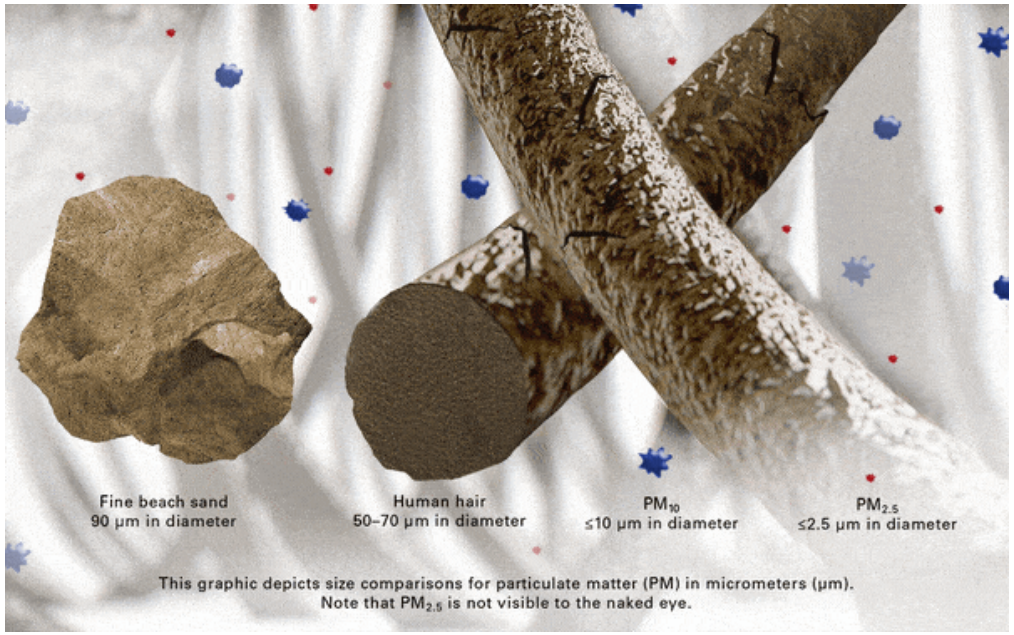

Image Source: EPA

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Sources of Particulate Matter

Indoor Sources	Outdoor Sources
• **Cooking**: broiling, frying, or grilling; • **Combustion Activities**: smoking tobacco, burning candles or incense, and using fireplaces, oil furnaces, gas stoves and fuel-burning space heaters; • **Household Products**: cleaning products, air fresheners, oil diffusers, and aerosol sprays; • **Hobbies**: woodworking, metalworking, 3D printing, making stained glass, and spray painting; • **Biological Sources**: pets, mold spores, dust mites and cockroaches;	• Vehicle exhaust, wildfire smoke, campfires, road dust, pollen, mining operations, agricultural activities and factory emissions. • Outdoor PM can enter buildings through windows, doors, ventilation systems and small cracks and crevices.

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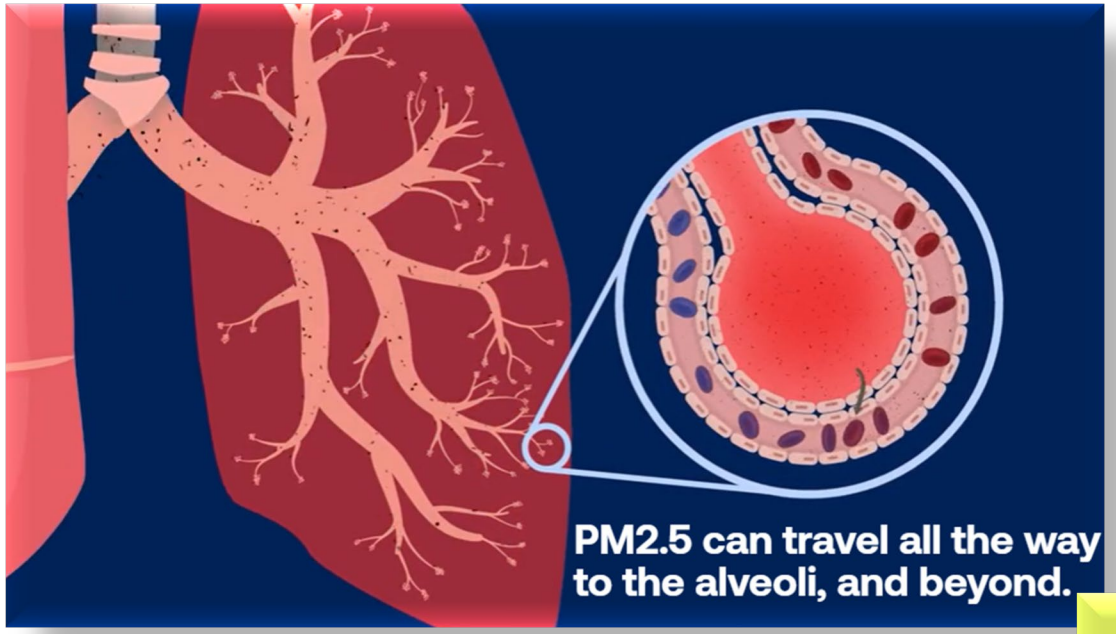
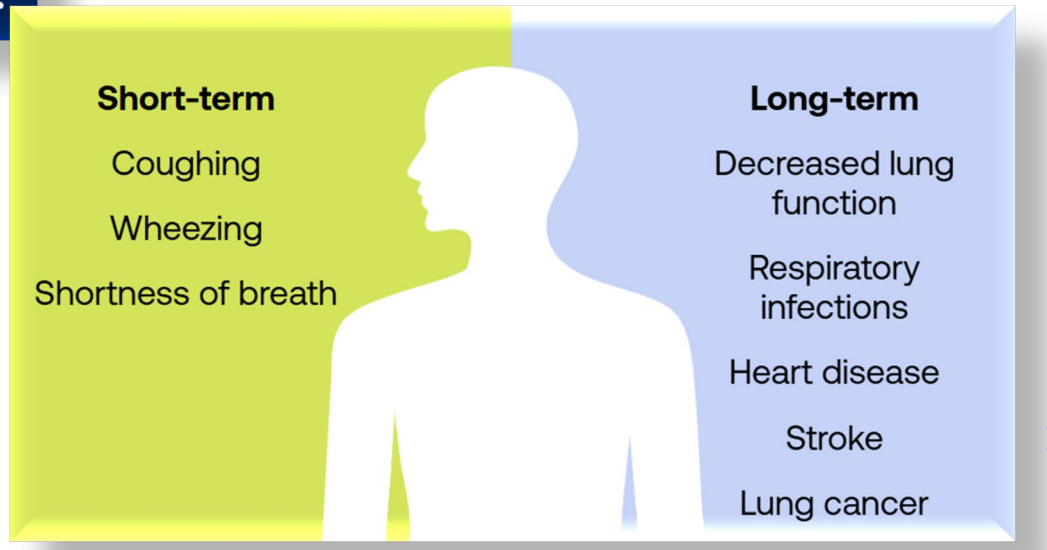
Health Impacts and Particulate Matter



- Mortality & morbidity
- Respiratory effects
- Respiratory infections
- Ischemic heart disease
- Cerebrovascular disease

- Heart failure
- Systemic inflammation
- Diabetes
- Impaired neurological development
- Neurological disorders



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PM: Assessing for Exposure

- No validated screening tool for PM
- Look for symptoms and likely exposures
- Response is variable
  - Concentration
  - Exposure dose
  - Health of the patient

With lung disease:	Without lung disease:
Coughing	Minor irritation
Sneezing	Coughing
Tightness of chest	Wheezing
Dyspnea	Shortness of breath

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PM: Educating and Counseling

Source Control	• Avoid burning indoors (candles, fireplaces, cigarettes, etc.) • Never use unvented fuel-burning stoves, fireplaces • Maintain fireplace, woodstove, and other fuel-burning appliances • Close doors/windows when outdoor PM is high/low Air Quality Index • Keep pets off furniture
Ventilation	• Open doors and windows for 15 minutes each day, low traffic • Install and use exhaust fans when cooking • Use respirators, PPE, & ventilate when doing hobbies
Air Cleaning	• Upgrade home's furnace filter to higher MERV rating (13+) • Change filters every 30 days or so • Use a portable air cleaner • Vacuum, dust, mop weekly

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Volatile Organic Compounds (VOCs)

What is it | Health Impacts| Assessing | Educating

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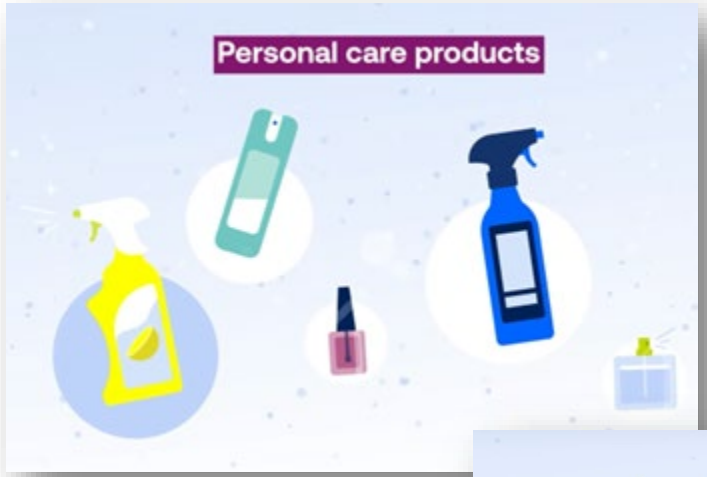
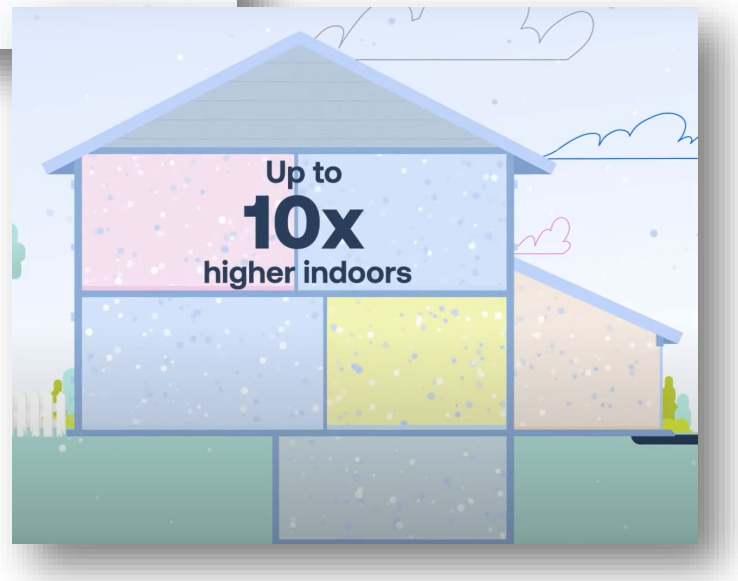
What are VOCs?





Gases that vaporize at room temperature (aka “off-gassing”)

Found in many products we use every day

VOCs are higher indoors than outdoors

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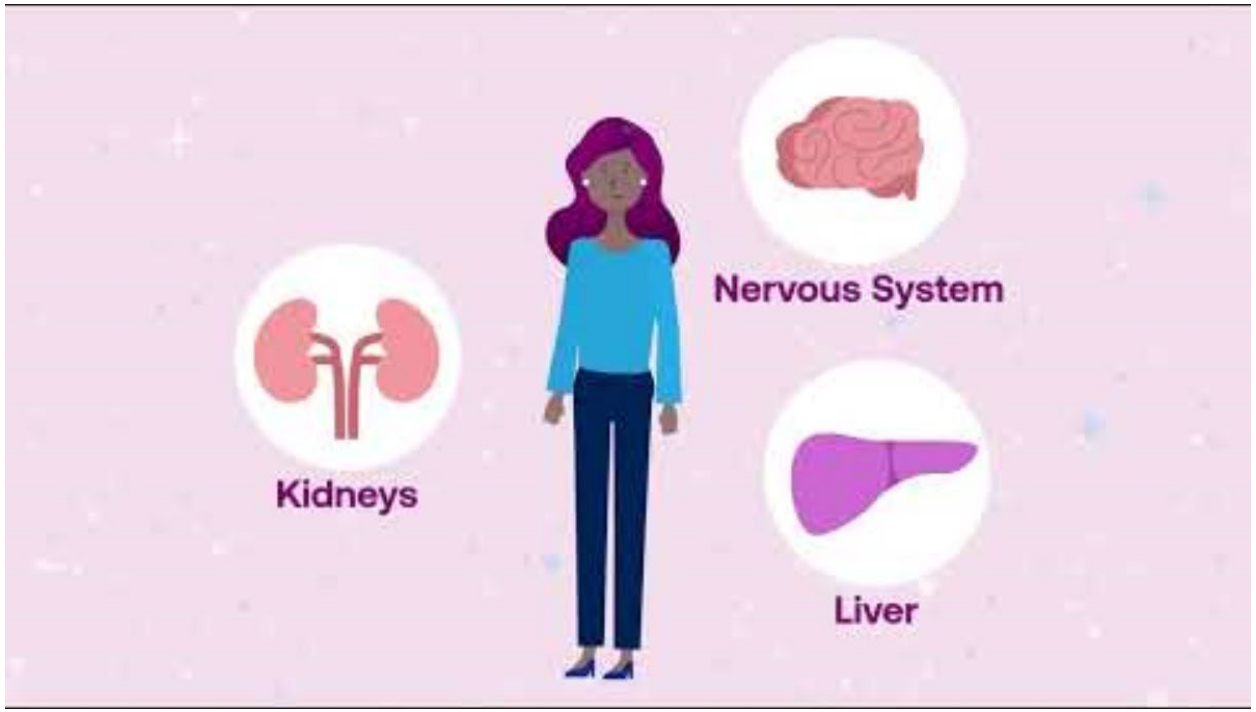
Health Impacts and VOCs - video

Long-term exposure can damage the liver, kidneys, and central nervous system, and some VOCs are linked to cancer. They may **worsen symptoms** for people with **asthma and COPD**.



VOCs are known irritants that can affect anyone!

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VOCs: Assessing for Exposure

Long-term: Some VOCs linked to cancer and can affect the liver, kidney and nervous system

Short-term:

- Headaches
- Dizziness
- Nausea
- Eye and respiratory irritation
- Goes away when exposure does.

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VOCs: Educating and Counseling

Everyone should reduce their exposure!

- Ask patients about general VOC use
- Educate patients on VOC exposure reduction

Source Control	•Eliminate or minimize use •Opt for low-VOC options if available. •Buy only needed material •Don't smoke
Ventilation	•Open windows & use a fan •Let new items off-gas in garage •Don't store VOCs indoors •Ventilate near printers/copiers
Air Cleaning	•Consider using portable air cleaners equipped with HEPA filters to neutralize VOCs

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Residential Combustion

What is it | Health Impacts| Assessing | Educating

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What is Residential Combustion?

Burning of fuel inside a home for various purposes like:	How and when are these fuels burned in the home?	How can they be detected and mitigated?
• Heating homes and water • drying clothes • cooking food	• Methane (large component of natural gas), • wood • propane • heating oil, or other fuel	• Carbon monoxide detectors should be installed in every home • Use personal protection, source control, ventilation and air cleaning

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Health Impacts and Residential Combustion

Combustion By-products

Nitrogen Oxides	• A respiratory irritant
Carbon Monoxide	• Impairs blood's ability to carry oxygen from the lungs to the rest of the body
Particulate Matter	• Affects multiple body systems and can increase the risk of premature death
Air Toxins	• Can cause headaches, cancer, birth defects, and other serious health harms.

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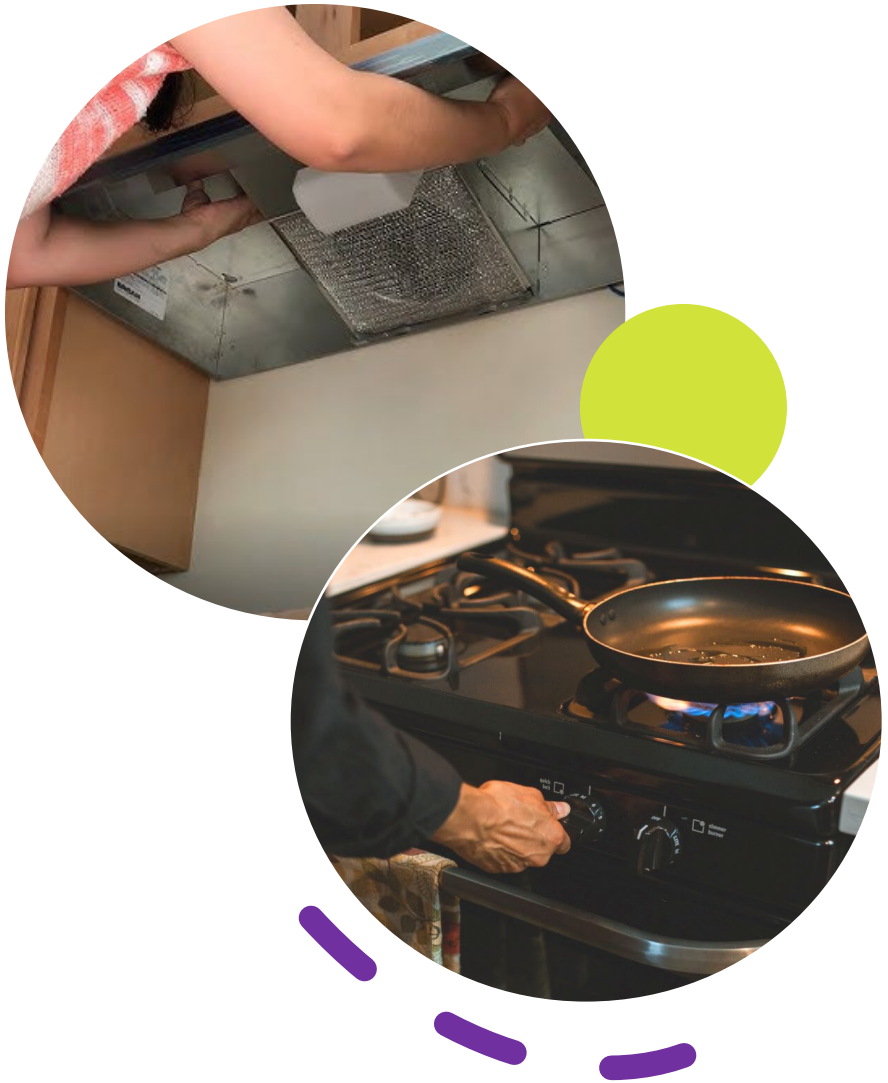
Residential Combustion: Assessing for Exposure



Some questions to ask patients include:

- Do you use natural gas, propane, heating oil, or wood to cook, heat your home, or dry your clothes?
- How old are your heating or cooking appliances?
- Is there adequate ventilation in your home?
- Do you have a carbon monoxide detector installed in your home?

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Residential Combustion: Educating and Counseling

To ***eliminate*** exposure:	To ***reduce or manage*** exposure:
stop use of unnecessary wood burning replace gas appliances with electric as circumstances allow	• Install carbon monoxide monitors • Transition from gas to electric appliances • Use EPA certified products • Ventilate any areas where fuel is burning; use exhaust fans when cooking • Use air cleaners • Have furnaces (oil and gas), flues and chimneys inspected annually and repair cracks and/or damaged parts.

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Putting it together!

PATIENT CHART

PATIENT: Sofia	AGE: 34	SEX: Male (Female)

Patient Status: (Check all that apply)

	History/Symptoms		Diagnosis
	Test Ordered		Treatment Plan

HISTORY:

ALLERGIES:

- ✓ No known allergies
- ✓ New home
- ✓ Paint
- ✓ Flooring
- ✓ Gas appliances
- ✓ Could be poor IAQ

SYMPTOMS:

- ✓ Frequent headaches (6 mos)
- ✓ Nose irritation
- ✓ Watery eyes
- ✓ Missing work
- ✓ Concerned for health of unborn child

At higher risk because of pregnancy

TEST ORDERED (list below)	RESULTS

DIAGNOSIS:	TREATMENT PLAN:

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Putting it together!

Provider: _____ Clinic: _____

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My Indoor Air Quality **Action Plan**

Sofia

Patient Name: _____ DOB: ___ / ___ / ___

Identified Pollutants: ☑ Radon ☐ Mold ☑ Volatile Organic Compounds (VOCs) ☑ Residential Combustion ☑ Particulate Matter (PM) ☐ Allergens ☐ Other _____

Recommended Actions for All Pollutants

Source Control
Eliminate or reduce the source of pollutant

1. Damp dust, mop, and vacuum with HEPA vacuum cleaner weekly
2. Remove shoes when entering the home
3. Do not use air fresheners, candles, or incense
4. Don't smoke or vape in the home
5. Avoid using harsh chemicals
6. Remove pets from bedroom
7. Replace carpets with hard surface flooring, remove rugs

Ventilation
Bring fresh outdoor air indoors

1. Open windows for 5-10 minutes each day
2. Use exhaust fans in the kitchen when cooking
3. Use exhaust fan in bathroom when bathing/showering
4. Open a windows when using products with volatile organic compounds (VOCs)

Air Cleaning
Filter pollutants out of the air

1. Use a MERV 13 (or higher) HEPA furnace filter
2. Change furnace filters at least every two months
3. Use an air cleaner to reduce airborne pollutants in a single room

Radon

- ✓ Test the radon levels in your home. You can either order a do-it-yourself radon test kit or ask your local health department about free test kits.
- ✓ If a radon test shows you have a high level of radon, 4 pCi/L or more, take action by contacting a certified radon professional.
- ✓ If levels are between 2 and 4 pCi/L, the EPA and the Lung Association agree that radon reduction should be considered.
- ✓ Re-test your home 30 days after a mitigation system has been installed.
- ✓ If you rent, contact your landlord

Particulate Matter

- ✓ Don't burn anything indoors unless necessary
- ✓ Avoid using candles and incense
- ✓ Do not use air fresheners, oil diffusers, essential oils, or aerosol sprays
- ✓ Use high quality respirators or Protective Personal Equipment when doing hobbies that generate dust/particles
- ✓ Close up home during wildfire smoke events or during high-pollution times if near highways, factories, ports, etc.
- ✓ Use exhaust fans when cooking

1-800-LUNGUSA | Lung.org

Mold

- ✓ Fix any water leaks or pipes in your home
- ✓ Clean up spills and excess water promptly
- ✓ Keep humidity between 30-50%
- ✓ Keep unused rooms open
- ✓ Keep closets uncluttered
- ✓ Open curtains/window shades
- ✓ Keep space between the wall and your furniture (6") to help reduce moisture
- ✓ Allow space in storage areas for air circulation
- ✓ Remember: Moisture control = Mold control

Volatile Organic Compounds

- ✓ Avoid using products labeled *Caution, Warning, Danger, or Poison*
- ✓ Do not mix cleaning products
- ✓ Remove unwanted products from the home
- ✓ Use alternative lower VOC options (like paints)
- ✓ Keep containers sealed and out of main living areas
- ✓ Let new carpet/building products air outside before installing them
- ✓ Open windows when using any products with VOCs

Residential Combustion

- ✓ Install carbon monoxide monitors
- ✓ Ensure gas appliances, wood stoves, and fireplaces are maintained and inspected annually
- ✓ Ventilate any areas where fuel is burning by opening doors/windows or turning on exhaust fans
- ✓ Transition from gas to electric appliances

Allergens

- ✓ Cover mattresses and pillows with allergen encasements
- ✓ Wash bedding in hot water once a week
- ✓ Reduce clutter and stuffed animals
- ✓ Consider replacing carpet with hard-surfaced flooring
- ✓ Remove upholstered furniture or use furniture with smooth surfaces for easy cleaning
- ✓ Wash hands and face after being outdoors
- ✓ Wash hair before bed after being outdoors

Pets and Pests

- ✓ Reduce pet dander by keeping pets out of bedrooms, off furniture, and out of carpeted areas
- ✓ Empty pet dishes at night
- ✓ Don't leave water or dishes collecting in the sink
- ✓ Empty garbage often and clean up crumbs
- ✓ Store food in sealed containers
- ✓ Use mechanical means to eliminate rodents (traps)
- ✓ Use low toxicity pesticides to eliminate cockroaches (sticky traps or boric acid)
- ✓ Remove clutter

To Learn More and Take Action

Scan the QR Below

- ✓ Visit Lung.org for DIY Healthy Home Check-Up Assessment
- ✓ Visit Lung.org/Radon to purchase a Radon test kit
- ✓ Call 1-800-LUNGUSA

1-800-LUNGUSA | Lung.org

February 2025

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Resources

Educate Yourself & Patients

IAQ Resource Hub for HCPs
Lung.org/IAQResources

IAQ Action Plan

Invisible Risks: The Health Impacts of Indoor Air Quality: Free online learning module offering 1 CRCE

Take Action

DIY Healthy Home Check-up assessment

Purchase Radon test kit

Advocate: Lung.org/clean-air/stand-up-for-clean-air

1-800-LUNGUSA

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Oregon Clean Air at Home Program

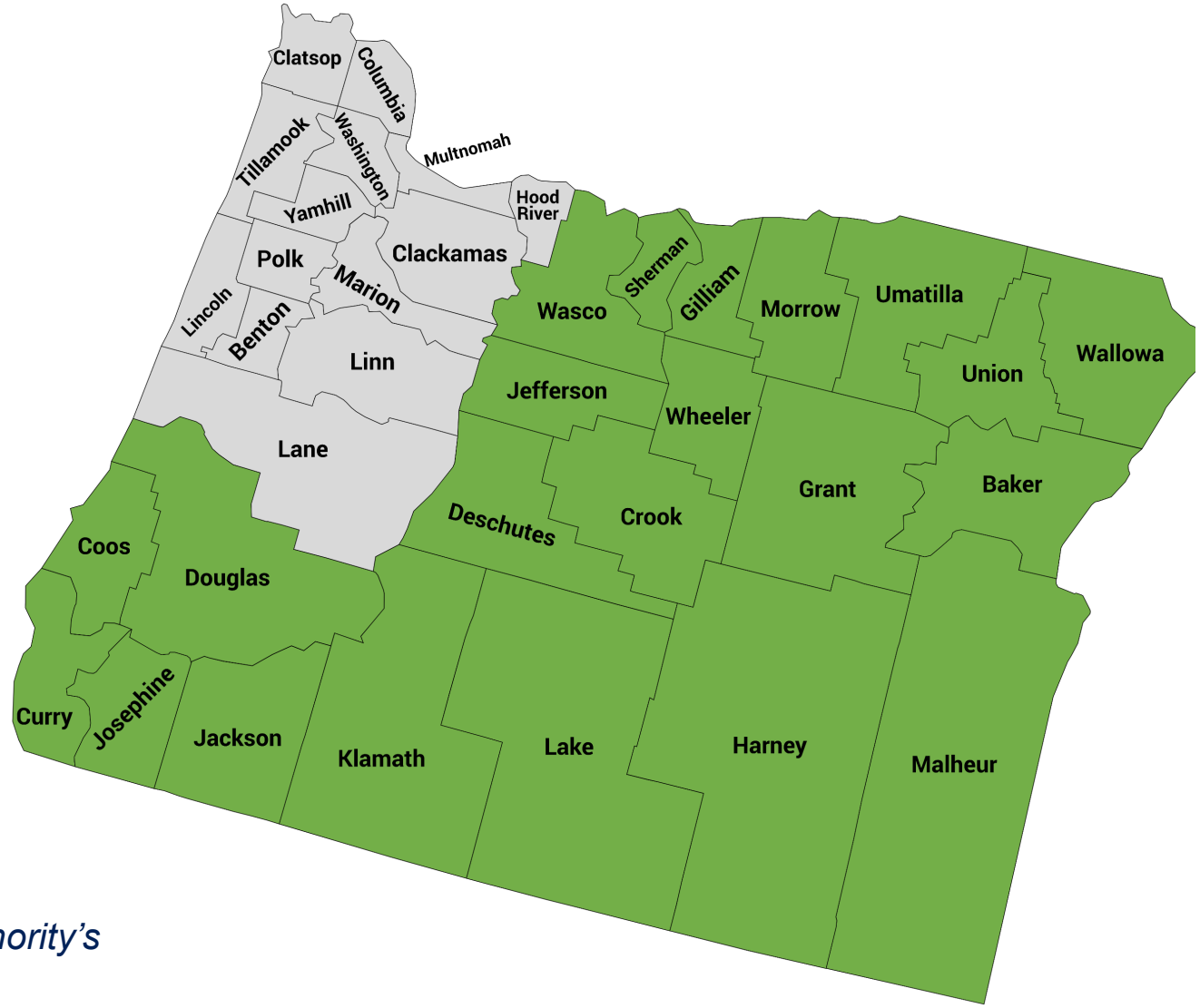
Alexis Gigliello, MPH
Manager | Nationwide Indoor Air Quality

Program Eligibility

At least one household member living with asthma, COPD or another lung disease.

A household income equal to or below 80% of the area average income.

An address in one of the following 22 counties.



Support for this program is provided by Oregon Health Authority's Healthy Home Grant Program (HHGP).

Program Overview

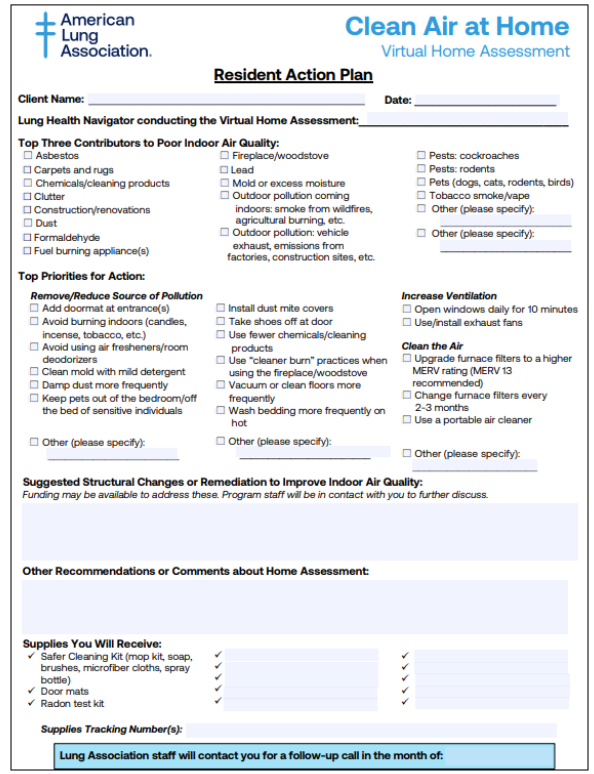
Residents are matched with a Lung Health Navigator who will work with them one-on-one to:

Conduct ***virtual home assessment***

a) Assess the living space
b) Identify lung disease triggers
c) Educate on lung disease management

Develop ***personalized action plan*** with educational resources and low-cost/no-cost solutions.

Determine ***remediation supplies and contract services*** to help reduce asthma and/or COPD triggers.



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Clean Air at Home
Virtual Home Assessment

Resident Action Plan

Client Name: _____ **Date:** _____

Lung Health Navigator conducting the Virtual Home Assessment: _____

Top Three Contributors to Poor Indoor Air Quality:

- ☐ Asbestos
- ☐ Carpets and rugs
- ☐ Chemicals/cleaning products
- ☐ Clutter
- ☐ Construction/renovations
- ☐ Dust
- ☐ Formaldehyde
- ☐ Fuel burning appliance(s)
- ☐ Fireplace/woodstove
- ☐ Lead
- ☐ Mold or excess moisture
- ☐ Outdoor pollution coming indoors: smoke from wildfires, agricultural burning, etc.
- ☐ Outdoor pollution: vehicle exhaust, emissions from factories, construction sites, etc.
- ☐ Pests: cockroaches
- ☐ Pests: rodents
- ☐ Pets (dogs, cats, rodents, birds)
- ☐ Tobacco smoke/vape
- ☐ Other (please specify): _____
- ☐ Other (please specify): _____

Top Priorities for Action:

Remove/Reduce Source of Pollution

- ☐ Add doormat at entrance(s)
- ☐ Avoid burning indoors (candles, incense, tobacco, etc.)
- ☐ Avoid using air fresheners/room deodorizers
- ☐ Clean mold with mild detergent
- ☐ Damp dust more frequently
- ☐ Keep pets out of the bedroom/off the bed of sensitive individuals
- ☐ Other (please specify): _____
- ☐ Install dust mite covers
- ☐ Take shoes off at door
- ☐ Use fewer chemicals/cleaning products
- ☐ Use "cleaner burn" practices when using the fireplace/woodstove
- ☐ Vacuum or clean floors more frequently
- ☐ Wash bedding more frequently on hot
- ☐ Other (please specify): _____

Increase Ventilation

- ☐ Open windows daily for 10 minutes
- ☐ Use/install exhaust fans

Clean the Air

- ☐ Upgrade furnace filters to a higher MERV rating (MERV 13 recommended)
- ☐ Change furnace filters every 2-3 months
- ☐ Use a portable air cleaner
- ☐ Other (please specify): _____

Suggested Structural Changes or Remediation to Improve Indoor Air Quality:
Funding may be available to address these. Program staff will be in contact with you to further discuss.

Other Recommendations or Comments about Home Assessment:

Supplies You Will Receive:

- ✓ Safer Cleaning Kit (mop kit, soap, brushes, microfiber cloths, spray bottle)
- ✓ Door mats
- ✓ Radon test kit

Supplies Tracking Number(s):

Lung Association staff will contact you for a follow-up call in the month of:

Program running through November 2027

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During a Home Assessment

Have you been hospitalized due to your lung disease?

Do you have a fireplace or a woodstove?

What lung disease symptoms do you experience?

What medication do you use to control your symptoms?

Does the home have a carpet?

Do you use air fresheners?

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Eligible Remediation Supplies

Core Supplies

- ✓ Safer cleaning supplies (castile soap, microfiber cloths, etc.)
- ✓ Furnace filter
- ✓ Mop kit
- ✓ Walk off mats

As-needed Supplies

- ✓ Mattress cover
- ✓ Pillowcase
- ✓ Food storage container
- ✓ Mouse trap
- ✓ Boric acid
- ✓ Radon test

Specialty Devices

- ✓ Air cleaner
- ✓ Dehumidifier
- ✓ HEPA vacuum
- ✓ Others as identified

*Ensure all homes have smoke detectors, carbon monoxide detectors and fire extinguishers

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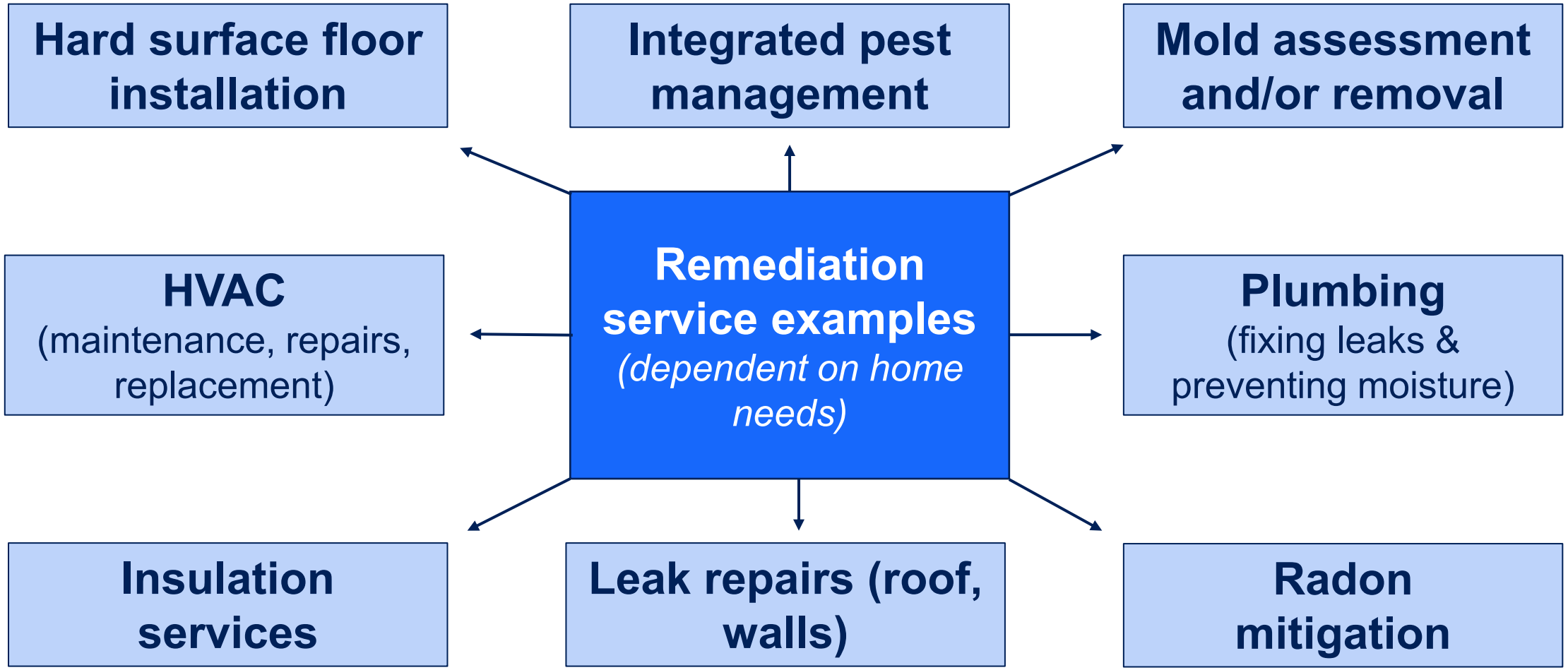
Eligible Remediation Services



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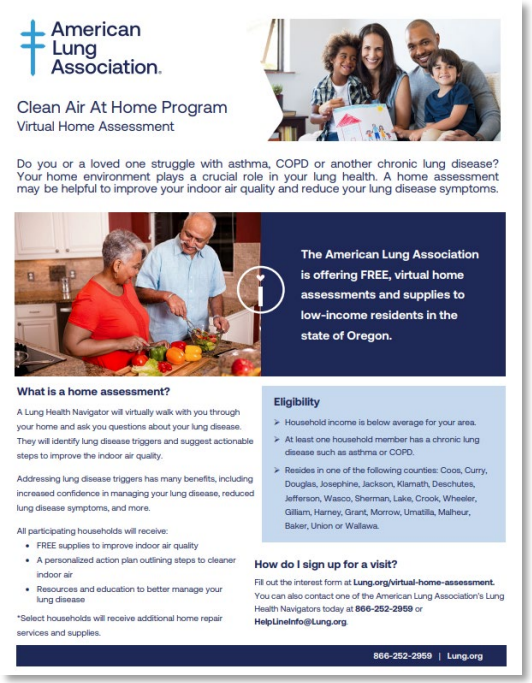
Program Enrollment & Referrals

Public health professionals & community leaders can:

1. **Directly refer clients/patients**
2. **Help residents enroll**
3. **Share program promotional material**
   - Share promotional materials (flyer, social media toolkit, email language)
   - *Flyer is available in Spanish!*



American Lung Association.

Clean Air At Home Program
Virtual Home Assessment

Do you or a loved one struggle with asthma, COPD or another chronic lung disease? Your home environment plays a crucial role in your lung health. A home assessment may be helpful to improve your indoor air quality and reduce your lung disease symptoms.

The American Lung Association is offering FREE, virtual home assessments and supplies to low-income residents in the state of Oregon.

What is a home assessment?

A Lung Health Navigator will virtually walk with you through your home and ask you questions about your lung disease. They will identify lung disease triggers and suggest actionable steps to improve the indoor air quality.

Addressing lung disease triggers has many benefits, including increased confidence in managing your lung disease, reduced lung disease symptoms, and more.

All participating households will receive:

- FREE supplies to improve indoor air quality
- A personalized action plan outlining steps to cleaner indoor air
- Resources and education to better manage your lung disease

*Select households will receive additional home repair services and supplies.

Eligibility

- Household income is below average for your area.
- At least one household member has a chronic lung disease such as asthma or COPD.
- Resides in one of the following counties: Coos, Curry, Douglas, Josephine, Jackson, Klamath, Deschutes, Jefferson, Wasco, Sherman, Lake, Crook, Wheeler, Gilliam, Harney, Grant, Morrow, Umatilla, Malheur, Baker, Union or Wallawa.

How do I sign up for a visit?

Fill out the interest form at **Lung.org/virtual-home-assessment**. You can also contact one of the American Lung Association's Lung Health Navigators today at **866-252-2959** or **HelpLineInfo@Lung.org**.

866-252-2959 | Lung.org

Visit **Lung.org/virtual-home-assessment** to complete the online enrollment form.

American Lung Association.

Our Vision

A World Free of Lung Disease

Ashley.Petrolino@Lung.Org

American Lung Association.