Connecting Health & Housing: Asthma and the Home

Presented by:

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Public Health Training Center

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Learning Objectives

After this tutorial you will be able to…

1. Identify the magnitude of the public health problem: asthma
2. Understand the connection between asthma and the home environment
3. Address asthma triggers in the home environment and provide healthy homes recommendations to clients with asthma

Identify the Problem

- Asthma is a chronic and incurable disease of the respiratory system.
  - Inflammation of the airways
  - Constriction of airway smooth muscles
  - Hyperresponsiveness of the airways in reaction to external stimuli
    - Occasionally, permanent changes to the lungs (airway remodeling)
  - Difficult to breathe

Identify the Problem

- Symptoms
  - Coughing
  - Wheezing
  - Chest tightness
  - Shortness of breath
- Often worse at night and in early morning

Identify the Problem

- Symptoms may:
  - Vary greatly between individuals with asthma
  - Lessen or disappear over time
  - Worsen during certain times of the year
  - Worsen in response to certain stimuli
- Acute worsening of asthma symptoms: asthma attack

Identify the Problem

- In 2011, nearly 50% of all asthmatics suffered an asthma attack
  - 13.2 million asthmatics had an asthma attack
  - More than 4 million children had asthma attacks
- Asthma attack symptoms may subside with quick-relief medications,
  - An asthma attack can be fatal!

Magnitude of the Problem

- Asthma affects millions of people throughout the world and in the U.S.
  - 300 million people worldwide
  - 7 million American children
  - 19 million American adults
- Asthma prevalence at all-time high; continues to increase
  - Children 5 – 17 years of age have highest rates of asthma

Magnitude of the Problem

- Major cause of morbidity in the U.S., particularly for children
  - lung function decline associated with asthma
  - Decreases ability to perform normal activities and quality of life
- Asthma deaths in U.S. > 3,300 annually

Magnitude of the Problem

- Morbidity and mortality associated with asthma is a burden on the U.S. health care system
- In 2009:
  - 9 million ambulatory care visits
  - 1.9 million emergency department visits
  - 480,000 hospital admissions

Magnitude of the Problem

- Asthma is a burden on educational potential and productivity:
- In 2008:
  - 14.4 million children missed school days attributed to asthma
  - 14.2 million adult work days missed due to asthma

Magnitude of the Problem

- Direct medical costs associated with asthma in U.S. (2007) = $50.1 billion
- Total costs much higher if include additional indirect costs
  - lower educational attainment
  - lost productivity
  - premature death

Connection to the Home

- Development of asthma is a complex process
  - A combination of genetic factors and environmental factors contribute to asthma development
- The exacerbation of asthma symptoms is better understood
  - A number of "triggers" found in homes have been shown to exacerbate asthma

Connection to the Home

- Recognized asthma triggers, commonly found in the home environment:
  - Environmental tobacco smoke (secondhand smoke)
  - Mold and mold spores
  - Cockroach allergen
  - House dust mite allergen
  - Warm-blooded pet allergens
  - Nitrogen dioxide (NO_2; an odorless gas)

Connection to the Home

Asthma Trigger	Source	Location in the Home
Environmental tobacco smoke	Home occupant or visitor behaviors	Anywhere smoking is permitted
Mold and mold spores	Damp or wet surfaces that encourage mold growth	Rooms with excess moisture (e.g., kitchens, bathrooms) or anywhere with plumbing leaks
Cockroach allergen	Body parts, secretions, and droppings that contain allergens	Anywhere food, water, and shelter is available to pests
House dust mite allergen	Body parts and droppings that contain allergens	In mattresses, bedding, upholstery, and stuffed toys
Warm-blooded pets	Skin flakes, urine, and saliva that contain allergens	Anywhere pets are allowed indoors
Nitrogen dioxide (NO_2)	Combustion gas appliances	Gas stoves or water heaters, fireplaces, space heaters

Healthy Homes Recommendations

- Asthma cannot be cured, but symptoms can be controlled
- Effective asthma management:
  1. Regular medical check-ups
     - Including the use of an Asthma Action Plan
  2. Pharmacologic therapy
     - Both long-term control and quick-relief medications
  3. Asthma education
  4. Reducing exposure to environmental contributors

Healthy Homes Recommendations

Asthma Trigger	What can be done to reduce exposure?
Environmental tobacco smoke	• Establish a smoke-free policy inside and directly outside the entrances of your home • Avoid smoking in your car • Consider removing clothing that is exposed to smoke prior to entering the home
Mold and mold spores	• Check for and quickly repair water leaks • Eliminate standing water near your home • Ensure irrigation systems direct water away from your home • Open windows or use exhaust fans in rooms where water is frequently used (e.g., kitchens and bathrooms) • Reduce indoor humidity
Cockroach allergen	• Eliminate clutter and clean frequently • Keep food stored in airtight containers that are inaccessible to pests • Keep trash in sealed containers and away from the home, when possible • Seal small cracks or holes where pests could intrude • Ensure all open windows are screened • Avoid the use of volatile pesticides that may irritate asthma (use sealed poison baits or sticky traps instead)

Healthy Homes Recommendations

Asthma Trigger	What can be done to reduce exposure?
House dust mite allergen	• Wash bed linens weekly in hot water (>130° F) • Utilize allergen-reducing covers on pillows and mattresses • Reduce indoor humidity to <60% (ideally to between 30 – 50%) • Replace carpets and upholstered furniture with smooth, cleanable materials and textiles • Minimize the number of stuffed toys in children's rooms and launder them regularly • Regularly vacuum, with a HEPA vacuum when possible
Warm-blooded pets	• The most effective treatment is to remove furry or feathered pets from the home • If removal is not possible, keep pets outside or, at minimum, outside of sleeping areas • Replace carpets and upholstered furniture with smooth, cleanable materials and textiles • Regularly brush pets outside to remove loose dander and hair • Regularly vacuum, with a HEPA vacuum when possible
Nitrogen dioxide (NO_2)	• Ensure gas-burning appliances are properly functioning and that they vent to the outside of your home • Ensure chimneys are clean and the flue is open during use • Replace heating, ventilation, air conditioning (HVAC) system air filters every 1 – 3 months • Avoid the use of gas-burning space heaters indoors

Conclusion

- As a public health professional you may:
  - identify potential environmental asthma triggers during visits to client homes
  - provide critical education regarding the best ways to avoid exposures to environmental asthma triggers