PROMOTING HEALTHY ENVIRONMENTS FOR CHILDREN

Indoor Air Pollutants

Key Points

Indoor air quality affects children's health.

- Children spend 80% to 90% of their time indoors and therefore are frequently exposed to pollutants in indoor air.
- Major sources of indoor air pollutants include tobacco smoke, gas and wood stoves, pets and pests, mold, furnishings, and construction materials.
- The most important step to reduce the concentration of indoor air pollutants in the home is to prohibit smoking indoors. Additional key steps for improving indoor air quality include reducing other sources of common pollutants and ensuring adequate ventilation.
- If a child presents with persistent or unusual respiratory symptoms, clinicians should consider exposure to an indoor air pollutant as a possible cause.

Clinical Guidance

Indoor air pollution can be related to a wide range of activities and products including secondhand and thirdhand smoke, natural gas and wood fires, cleaners, furniture and fabric treatments, mold, and other chemicals. Exposure occurs when children breathe airborne pollutants, which may be particulates, gases, vapors, or biological materials. Inhalation of air pollutants can lead to various health effects such as upper and lower respiratory tract symptoms. Mucocutaneous exposure to some air pollutants can lead to irritation of the eyes, nose, and throat.

Prevention is key!

- To improve indoor air quality, reduce sources of pollutants and optimize ventilation.
- Addressing the source of exposure is more effective than trying to clean the air. Work with the family to identify possible indoor air pollutants and discuss steps to reduce or eliminate exposure to these pollutants.
- Encourage families to:
  - Eliminate smoking in any environment where children live and play.
  - Install carbon monoxide detectors and smoke alarms on each sleeping level of the home.
  - Use integrated pest management to eliminate pests safely.
  - Have furnaces, wood stoves, and fireplaces checked yearly by a professional to make sure they are clean and running efficiently.
  - Keep the home environment dry and fix all water leaks promptly.

- For homes with an attached garage, be sure that the door between the garage and home is kept closed tightly. Never leave any motor vehicle running in the garage or other enclosed space.
- Replace ammonia-containing and other toxic household cleaning supplies with less toxic alternatives, such as vinegar and water solution, or baking soda and water.
- If possible, store leftover chemicals such as paints, varnishes, solvents, and adhesives in a shed or area that is not frequently visited.
- Children should not be exposed to mothballs, or to clothes or bedding that have been stored with mothballs, as these may contain dangerous chemicals.
- Avoid chemical air fresheners and scented candles, as they do not improve air quality and may release many chemicals into the air. To avoid potential exposure to phthalates, do not purchase products with "fragrance" on the label as these may contain phthalates.
- Opening doors and windows, and operating ventilation systems for 48 to 72 hours after the installation of new furnishings or carpet may help reduce exposures to synthetic materials used in these items.

Air cleaners and purifiers

Air filters/cleaners should not be the only strategy used to reduce indoor air pollutants but may be an adjunct to source control and adequate ventilation.

- Some studies have documented that portable HEPA (high efficiency particulate air) purifiers can reduce indoor concentrations of particulate matter by about 25% to 50% and reduce asthma symptoms and exacerbations.
- Air cleaners must be maintained per manufacturer's instructions to ensure proper functioning.
- Ionizers and other ozone-generating air cleaners are not recommended for use in homes or schools. Under some conditions, these devices can release enough ozone indoors to lead to health effects.

For More Information

The following resources offer additional information regarding indoor air pollution:

- *Pediatric Environmental Health, 4th Edition* – AAP Policy Manual
- Indoor Air Quality Information Clearinghouse – US EPA
- Air Cleaners and Air Filters in the Home – US EPA
- American Lung Association
- Indoor Air Quality Scientific Findings Resource Bank
- Pediatric Environmental Home Assessment Form
- US Consumer Product Safety Commission

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