6th Annual NH Healthy Homes Conference

Reducing Asthma Risks Through Green Cleaning
Informed Green Solutions

Nonprofit working to improve environments where children spend their time:

- Schools
- Child Care/Early Care and Education Programs
Asthma in NH

- 1 in 9 New Hampshire children (28,000) and adults (114,563) have asthma.
- This equals the number of residents in Concord and Manchester combined.
Asthma and Asthmagens

Many cleaning, sanitizing, and disinfecting products can irritate the lungs, and trigger or even cause asthma.

Asthma is a chronic inflammatory disorder of the airways in the lungs

- Wheezing
- Coughing
- Chest tightness
- Trouble breathing
Studies of Health Impacts Associated with Cleaning Products

The following is an annotated literature review in chronological order, summarizing key findings of numerous scientific studies documenting the health effects associated with various cleaning products.

Toxicology and Applied Pharmacology 1984—Musk Ambrette, a commonly used fragrance ingredient, has been found to cause serious brain damage in laboratory animals.


Clinical and Experimental Allergy 1997—Asthma prevalence in schools has been associated with higher relative air humidity, higher concentrations of volatile organic compounds, and mold or bacteria.


Eighth International Conference on Indoor Air Quality and Climate 1999—Floor cleaning products...
Fumes from cleaning products used at work can make existing asthma worse, according to a new study of professional cleaning service employees. Products such as bleach, glass cleaner, detergents and air fresheners exacerbated asthma-related symptoms for the women, and their reduced lung function lasted until the morning after exposure, in some cases getting worse with time.

"These results support the importance of developing workplace health and safety practices designed to limit exposures to irritant chemicals in cleaning products," the study team wrote online April 23 in Occupational and Environmental Medicine.

Teachers, teachers aides and custodial staff have higher rates of occupational asthma.

“Conclusions - Asthma within the educational services industry is an occupational health problem. The identification, elimination, and/or control of respiratory hazards are important factors for the protection of staff and students alike.”
Research

*Occupational and Environmental Medicine 2005*
- Asthma symptoms in domestic cleaning women are associated with exposure to bleach and other irritants

*Thorax 2005*
- Pre-natal exposure to common cleaning products, paints, pesticides, etc. increased the risk of persistent wheezing in the young child

*Thorax 2004*
- Children exposed to higher levels of VOCs have a greater incidence of asthma

*Journal of Occupational and Environmental Medicine 2003*
- 12% of work-related asthma cases in 4 states were strongly associated with exposure to cleaning products

*Thorax 2003*
- Asthma was found to be more prevalent in women previously or currently employed as domestic cleaners as compared to women who had never worked in the cleaning industry
Home Exposures

美国肺脏和危重病医学杂志2007年

研究了新发哮喘的风险在非专业家庭清洁工

医师诊断的哮喘发病率在每周至少使用清洁喷雾4天的人中较高

喷雾包括玻璃、家具和空气清新剂

Sprays included glass, furniture and air-fresheners
Children’s Vulnerability

Young children are more vulnerable to toxic chemicals and allergens in the physical environment.

- They breathe more air for their size, compared to adults.
- Their skin touches the ground (where harmful chemicals collect).
- They absorb harmful chemicals through their skin, which is thinner than an adult’s.
- They stick a lot of objects in their mouths.
Exposure

Children exposed to the same dose of environmental toxins and/or chemicals have proportionately much greater exposure compared to adults.
Safety of Cleaning, Sanitizing and Disinfecting Products

Buyer Beware – a product is allowed to be sold until proven harmful.

OR

“Precautionary Principal” – a product should be proven safe before it is allowed to be sold to the public.
Hazards of Cleaners, Sanitizers and Disinfectants

The words "natural," "nontoxic," and "green" that appear on product labels are largely unregulated by the government.

Products are not thoroughly tested for health effects before they are allowed to be sold.

Manufacturers are not required to list all the ingredients on the label.

Some cleaning, sanitizing, and disinfecting chemicals can cause health problems in children and staff.
Why Switch to Green Cleaning?

- The Environmental Working Group tested 21 common products used in California schools. They found:
  - 457 chemicals were emitted into the air
  - 6 known asthmagens
  - 11 known, probable or possible cancer-causing agents and
  - Others - endocrine disruptors
<table>
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<th>Cleaning Products</th>
<th>Air Contaminants</th>
<th>Ingredients Disclosed</th>
<th>Asthmagens Detected</th>
<th>Carcinogens Detected</th>
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<tr>
<td>Pine-Sol Cleaner</td>
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<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Ingredients

- Common asthmagens
  - Bleach
  - Disinfectant ingredients
    - Quaternary ammonium compounds
  - Fragrance ingredients
  - Hydrochloric acid
  - Ethanolamines
  - Pesticides
  - Volatile organic compounds (VOCs)
Quaternary Ammonium Compounds

- Benzalkonium chloride, dodecyl-dimethyl-benzylammonium chloride, lauryl dimethyl benzyl ammonium chloride

- Ingredients in the following products:
  - Cleaning products
  - Disinfectants
    - Aerosols
    - Wipes
  - Hand sanitizers
  - Others
Fragrance Ingredients

Ingredients can include:

- Phthalates
  - Plasticizer present in an array of products including vinyl composite flooring, PVC products, shower curtains, blinds, air fresheners, scented products etc.

- Volatile organic compounds (emitted as gases from certain solids or liquids)
  - Scents
  - Essential oils
Volatile Organic Compounds - VOCs

- Propellants in aerosol containers
  - Butane, benzene, ethanol, isobutane,
  - Propane
- Solvents - formaldehyde, toluene, zylene
- Other sources
  - White board markers, personal care products
- Ask for low-VOC versions of these products
VOCs

- Building Materials
  - Paints
  - Carpets
  - Adhesives
  - Flooring
  - Particle board
  - Textiles
  - Wallpaper
Pesticides

- Pesticides should not be used in our buildings unless all other means of control have been exhausted (integrated pest management)
- Associated with asthma:
  - Organophosphates, carbamates, pyrethrin/pyrethroid
  - Piperonyl butoxide (synergist)
- Less toxic versions are available for pest control
How Can We Protect Ourselves?

- Know what is in the products we are purchasing
  - Read labels
  - Use apps and websites
  - Look for third-party certification
Green Washing

- Manufacturers may claim their products
  - Are nontoxic to humans
  - Will not harm the environment
  - Pose no threat to health
- Products need third-party certification to show they meet standardized “green” criteria
- Material safety data sheets and labels do not give all the information and are hard to understand
Third-party Certification

“Independently Third-Party Certified” means that products have been certified by an established and legitimate, nationally-recognized program developed with the purpose of identifying environmentally preferable products.
Identifying Safer Products

Third-party certified cleaning products:

- Green Seal
- EcoLogo
- Design for the Environment’s Safer Choice
Green Seal

- Non-profit agency that sets safer standards and reviews products and programs
  - Institutional cleaning products
  - Restaurants
  - Hotels
  - Cleaning Companies
Green Seal

- GS-37 Criteria Restricts
  - Asthmagens
  - Carcinogens
  - Reproductive toxins
  - Skin sensitizers
  - Inhalation toxicants
  - Skin absorption
  - Volatile organic compounds
EcoLogo

- Non-profit started by the Canadian government
- Recently purchased by Underwriters’ Laboratory
- Sets safer standards for institutional and some retail products
EPA’s Safer Choice

- Federal program that helps manufacturers identify safer ingredients for their products
- Certifies that products use safer ingredients
  - Mainly retail products in many categories
Safer Disinfectants

EPA DfE pilot project

- Reviewing ingredients and labeling some disinfectants as “safer”

Look for products that use the following:

- Hydrogen Peroxide
- Citric Acid
- L-lactic Acid
- Peroxyacetic Acid
- Sodium Bisulfate
What’s the Problem with Bleach?

• Bleach:
  • can cause asthma
  • triggers asthma episodes
  • can affect breathing
  • can irritate the skin and eyes
  • was the source of 35,000 poisonings in 2011

• Children are at greater risk from breathing bleach vapors because their lungs are still developing.
Other Programs

- GreenGuard
  - Measures emissions of products
    - Indoor air quality certification
    - Children and schools
    - Building construction
- Environmental Working Group
  - Sunscreens, personal care products etc.
- Women’s Voices for the Earth
  - Products used by women and children
- These and other groups are pressuring manufacturers to make safer products
Other Programs

Websites:
- Good Guide
- Healthy House Institute
- Healthy Stuff
- Less Toxic Guide
- Safe Cosmetics
- Skin Deep Database
- The Big Green Purse
- The Green Guide
A Green Cleaning Program

1. Safer cleaning products:
   • Third-party certified all-purpose and specialty cleaners
   • Disinfectants/sanitizers
2. Improved equipment:
   • Microfiber cloths
   • Microfiber mops with fillable handles
   • HEPA filter vacuums.
3. Staff training on procedures.
What is the Difference Between Cleaning, Sanitizing and Disinfecting?

- Before choosing any type of cleaning or antimicrobial product, you will first need to decide whether the surface needs to be:

  Cleaned

  Sanitized

  or

  Disinfected
Cleaning

• uses a detergent and water to physically remove dirt, grime and germs from surfaces. This process does not necessarily kill germs.
• removes molds and allergens that can trigger asthma symptoms.

Has been found to remove as much as 99% of germs when microfiber cleaning tools are used.
Sanitizing

• reduces the number of germs on hard surfaces or objects to a level considered safe for public health.
  • For food contact surfaces the level should be a 99.999% reduction in microorganisms within 30 seconds.
  • Sanitizing products should state on their label the surfaces they are intended to be used on.
Disinfecting

• **inactivates 99.999% of germs** on surfaces or objects if allowed to sit visibly wet or “dwell” on the surface for the recommended amount of “dwell” time.

• For use on:
  - changing tables
  - bathroom sinks and toilets
  - other areas as required by licensing regulations.

A disinfectant must stay on the surface for at least the recommended **dwell time** or it will not ‘destroy’ most of the germs.
Why Should We Clean First, Then Disinfect?

- Disinfectants don’t necessarily clean surfaces. Germs can hide under dirt and grime and are not affected by them.

- The products used to disinfect are more toxic and can be more expensive than products used to just clean.

- Overusing antimicrobial products may also lead to the spread of "super bugs." Superbugs are germs that are resistant to disinfectants and/or antibiotics.
Improved Equipment
Dry steam vapor technology:

• Very effective for cleaning and rapid sanitizing/disinfecting.

• Approved for most surfaces, including food contact surfaces.
Best Practices

- Spray into a cloth instead of on the surface, when possible.
- Use a stream rather than a mist when you are spraying a product.
- Train staff on using personal protective equipment (PPE) like gloves and goggles.
- Wear gloves, goggles, and other personal protective equipment when it is listed on the product label or Safety Data Sheet.
Best Practices

- Have written procedures for cleaning, sanitizing and disinfecting.
- Follow label directions.
- Leave the disinfectant solution glistening wet on the surface for the amount of time listed on the product label (dwell time).
- Clean from the top down.
School Resources

- EPA IAQ resources - http://www.epa.gov/iaq/schools/
- Informed Green Solutions Fact Sheets - http://informedgreensolutions.org
- NH Asthma Collaborative - http://asthmanownh.org/
Green Cleaning, Sanitizing and Disinfecting: A Toolkit for Early Care and Education

Available as a PDF at the following websites:
Center for Environmental Research and Children’s Health - http://cerch.org/greencleaningtoolkit/

For Additional Information

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