Hazards of cleaning and disinfecting: improving practice

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Dispelling myths

• Not just “harsh chemicals”
• Cleaning does not always require disinfecting
• Cleaning and disinfecting chemicals cause health problems
• Balancing protection from infectious disease and chemicals
“Clean as a Whistle, But What about that Wheeze?”

- >40 scientific articles—illness
- Adult Poison Center cases
  - 2\textsuperscript{nd} or 3\textsuperscript{rd}
  - Eye splash
  - Inhalation
- Respiratory illnesses
  - Upper
  - Lower
- Skin—irritation and sensitization
Exposures of confirmed WRA cases by asthma classification 2003-2013, MA

Note: Each case (N=481) may report up to three exposures
Agenda

• All disinfectants are hazardous (EPA registered *pesticides*)
  – Cleaning products are hazardous—but less so
• Disinfecting products are not all equal
  – Efficacy without carcinogens and asthmagens
  – Hydrogen peroxide promising
  – Disagreement among scientists
• Housekeeping staff are at risk for injury/illness
• Housekeeping staff must be involved in selecting products
ASTHMA AND OCCUPATIONAL EXPOSURE AMONG NURSES
“Deleterious role” cleaning products in asthma

Work exposure not related to home use

Severe and more symptomatic asthma, “markedly associated” with exposure to cleaning products
Just Released: Comprehensive Report on Safer Disinfectant Products

April 10, 2014

www.responsiblepurchasing.org
## 11 Active Ingredients Evaluated

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CANCER</th>
<th>REPRO TOX</th>
<th>ASTHMA</th>
<th>SKIN SENS</th>
<th>AQUATIC TOX</th>
<th>PERSIST</th>
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<tbody>
<tr>
<td>Caprylic Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Med acute</td>
<td>Low</td>
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<tr>
<td>Citric Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>Hydrogen Peroxide</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>High acute</td>
<td>Low</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>Ortho-Phenylphenol</td>
<td>Known</td>
<td>Suspected</td>
<td>No</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Peroxyacetic Acid</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Pine Oil</td>
<td>No²</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>None</td>
<td>Low</td>
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<tr>
<td>Quats</td>
<td>No</td>
<td>Suspected</td>
<td>Yes</td>
<td>One compound</td>
<td>High acute, med chronic</td>
<td>Very High</td>
</tr>
<tr>
<td>Silver</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>High acute</td>
<td>Very High</td>
</tr>
<tr>
<td>Sodium Hypochlorite (Chlorine Bleach)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Very high acute</td>
<td>Low</td>
</tr>
<tr>
<td>Thymol</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>High acute</td>
<td>Low</td>
</tr>
</tbody>
</table>
Third party certification

• Cleaning—not disinfecting
• As effective as usual products
• Multiple criteria—human health, environment
• Efforts in healthcare, state agency purchasing, schools
Green Seal Criteria for Institutional Cleaners (GS-37)

- Low toxicity
- No cancer-causing ingredients
- No asthmagens
- Not corrosive to eyes or skin or skin sensitizer
- Won’t pollute air or deplete ozone layer
- Won’t kill fish
- Low phosphorous

- Will biodegrade
- Package recyclable
- Available as concentrate
- Limits on fragrances used
- Certain ingredients prohibited
- Performance tested
- Vendor training available
New methods for sanitizing and disinfecting

• Microfiber cloths and mops
• No certification
  – EPA registration number (technology number)
• Questions
  – Organisms killed
  – Dwell time
  – Method
Electrolyzed water

- Water or water plus salt
- Create hypochlorous ions
- Added hazardous metal from the nozzle (hexavalent chromium)
- Cost?
- Effectiveness?
Electrolyzed water

• EcaFlo® Anolyte (US EPA Reg. No. 82341-1) with added salt
  – Creates weak bleach
  – Corrosive and health issues

• Activelon® and Ionator EXP® tap water only
  – Hexavalent chromium
• Steam
  – TANCS ®
• Ozone
  – Aqueous ozone—Tersano lotus® cleaning system
• Titanium dioxide coating
• Silver

• Impacts on staff of less frequent cleaning
Fear messages

“Simply do routine cleaning and disinfecting.”

http://www.flu.gov/professional/school/cleaning.html
Fear messages

Startling News About Your Underwear: Beware of your dirty underwear! Just touching it could make you sick.

When it comes to germs, dirty underwear is just about the worst thing you can touch, according to Dr. Germ, a.k.a. Charles Gerba, a microbiologist and clean water expert at the University of Arizona.

Here's the real shocker: Your clean underwear isn't much better. There is about a 10th of a gram of feces in the average pair of dirty underwear.

THE SEVEN SINS OF GREENWASHING

• Sin of the lesser of two evils, e.g. organic cigarettes

• Sin of fibbing, e.g. false claims

• Sin of irrelevance

http://sinsofgreenwashing.org/findings/the-seven-sins/
$100 for speeding and $250 for misleading the public.
Poop' dermatitis linked to fashionable toilet seats, harsh chemicals

- "Toilet seat dermatitis is ... legendary condition described in medical textbooks and ... in underdeveloped countries, but one that younger pediatricians have not come across in their daily practice," "... we need to make sure the condition is on every pediatrician's radar."
- Analyzing 5 cases from US and India in the *Pediatrics* 125(2), 2010, Litvinov, Sugathan, Cohen said the culprits responsible for the reemergence of the condition are harsh cleaning chemicals and exotic wooden toilet seats
- Pediatricians should ask about toilet seats and cleaners used at home and school
- [http://pediatrics.aappublications.org/content/125/2/e419.full.pdf+html](http://pediatrics.aappublications.org/content/125/2/e419.full.pdf+html)
Bottom line

• Clean
  – Instead of disinfect
  – Prior to disinfecting

• Recommended disinfectants
  – Oxivir Tb
  – Hydrogen peroxide products
  – Check dwell time and need for rinsing

• Check EPA registration information: Google EPA PPLS

• Explore new methods with skepticism

• Involve and train housekeeping workers
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Resources

- Responsible Purchasing Network
  www.responsiblepurchasing.org
- UMass Lowell Cleaning Laboratory
  http://www.turi.org/Our_Work/Cleaning_Laboratory
- Cleaning the Bathroom
- OSHA-NIOSH Protecting workers who use cleaning chemicals