

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

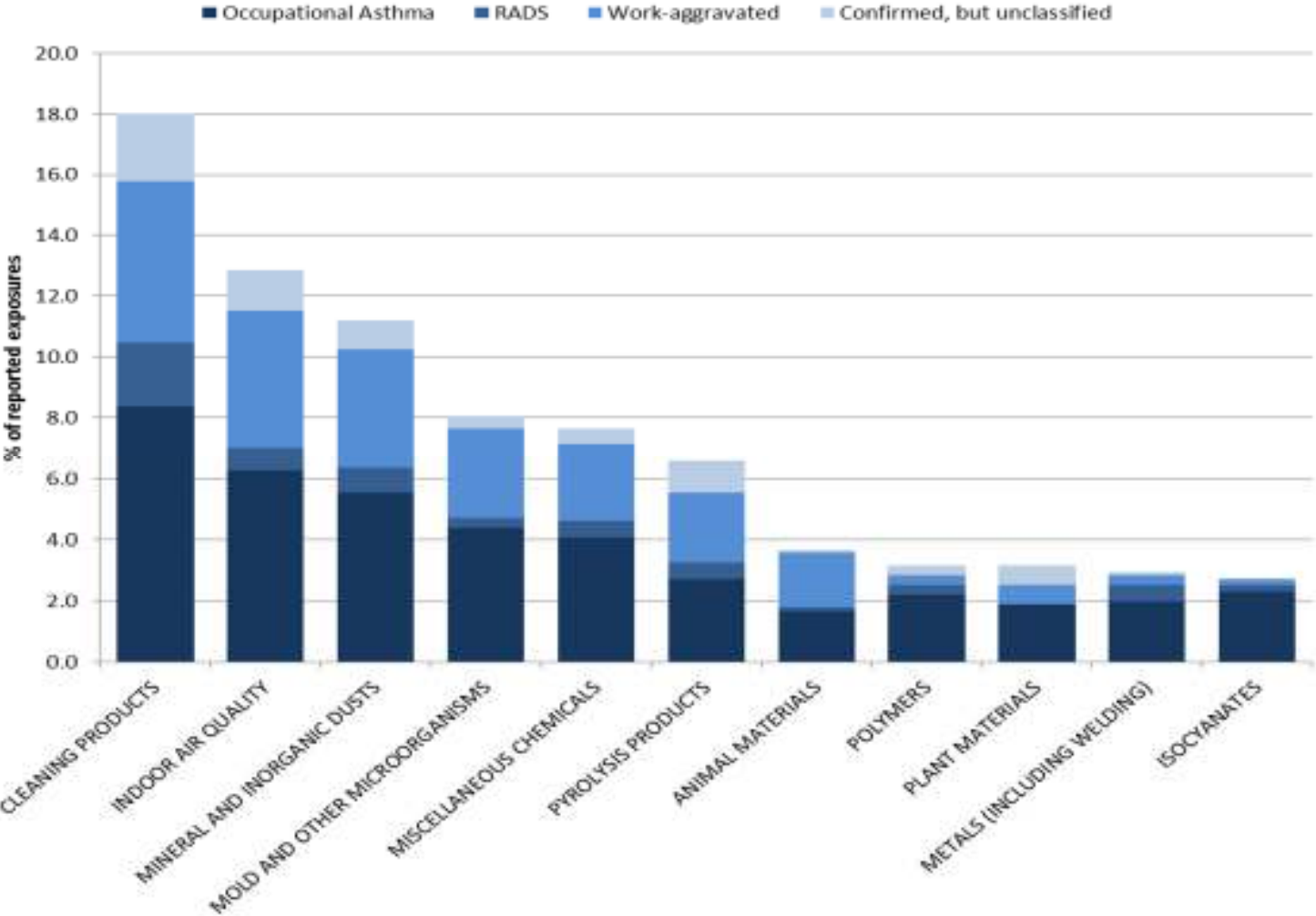


“Clean as a Whistle, But What about that Wheeze?”

- >40 scientific articles—illness
- Adult Poison Center cases
 - 2nd or 3rd
 - 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

Arif AA, Delclos GL, Serra C. Occupational exposures and asthma among nursing professionals. *Occup Environ Med* 2009;**66**:274–8.



Loomis, D. *Occup Environ Med* 2009;**66**:i

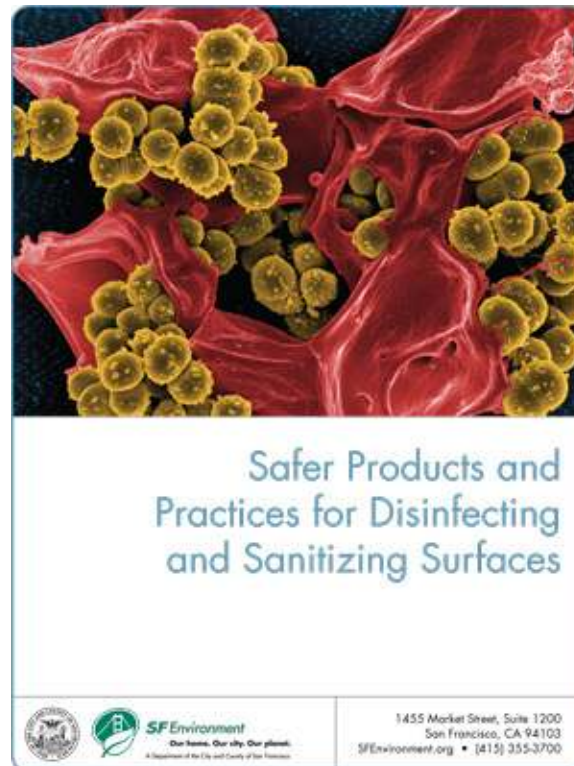
CLEANING AND ASTHMA CHARACTERISTICS IN WOMEN

Dumas O, Siroux V, Luu F, Nadif R, Zock J-P,
Am J Ind Med 2014; 57:303-11

- “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

ACTIVE INGREDIENT	CANCER	REPRO TOX	ASTHMA	SKIN SENS	AQUATIC TOX	PERSIST
Caprylic Acid	No	No	No	No	Med acute	Low
Citric Acid	No	No	No	No	None	Low
Hydrogen Peroxide	No	No	No	No	High acute	Low
Lactic Acid	No	No	No	No	None	Low
Ortho-Phenylphenol	Known	Suspected	No	No	Very high acute	Low
Peroxyacetic Acid	No	No	Yes	No	Very high acute	Low
Pine Oil	No ²	No	No	Yes	None	Low
Quats	No	Suspected	Yes	One compound	High acute, med chronic	Very High
Silver	No	No	No	No	High acute	Very High
Sodium Hypochlorite (Chlorine Bleach)	No	No	Yes	No	Very high acute	Low
Thymol	No	No	No	Yes	High acute	Low

Third party certification

- Cleaning—not disinfecting
- As effective as usual products
- Multiple criteria—human health, environment
- Efforts in healthcare, state agency purchasing, schools



for illustrative purposes only



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

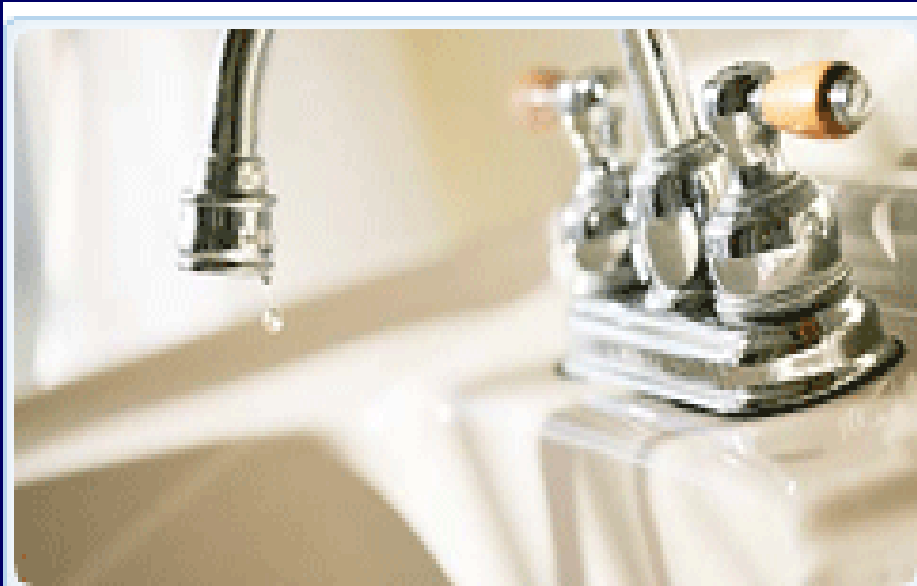
- Impacts on staff of less frequent cleaning

Fear messages



“Simply do routine cleaning and disinfecting.”

<http://www.flu.gov/professional/school/cleaning.html>



Just because a surface looks clean, doesn't mean that germs are gone.



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.

<http://webcenters.netscape.comuserve.com/homerealestate/package.jsp?name=fte/dirtyunderwear/dirtyunderwear>

THE SEVEN SINS OF GREENWASHING

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



- Sin of fibbing, e.g. false claims



- <http://sinsofgreenwashing.org/findings/the-seven-sins/>

- Sin of irrelevance



\$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>

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](http://www.turi.org/Our_Work/Cleaning_Laboratory)
- Cleaning the Bathroom
<http://www.mass.gov/anf/docs/osd/epp/fact-sheets/cleaningthebathroomflyer.pdf>
- OSHA-NIOSH Protecting workers who use cleaning chemicals
<https://www.osha.gov/Publications/OSHA3512.pdf>

