Hidden Chemicals in Consumer Products: What’s Not on the Label

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Silent Spring Institute
SILENT SPRING INSTITUTE is a non-profit scientific research organization dedicated to identifying the links between the environment and women's health, especially breast cancer.

We are a groundbreaking collaboration of scientists, physicians, health advocates, and community activists, and a leading edge research institution using multi-disciplinary, state-of-the-art approaches.

“A lab of our own”
Household Exposure Study

- 170 homes
- Air, dust, urine
- 89 endocrine disrupting compounds (EDCs)
- 30 measured for the first time indoors

Rudel et al. 2003 and 2010 ES&T
What are We Exposed To?

- About 20 chemicals per home
- 67 EDCs, 27 pesticides
- DDT 2/3 of homes
- Phthalates - 100% homes
- Parabens, alkylphenols - abundant
- Flame retardants - MA 10 x Europe levels; CA 200 X Europe
- 15 chemicals above guidelines (39 have guidelines)
- 100 of 120 homes above health guidelines

Rudel et al. 2003 and 2010 ES&T

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How can I reduce my exposure while science and regulations are being worked out?

What exposure source is priority for control?
Evidence-based exposure reduction

• Intervention studies
  – Organic diets
    (Lu et al., 2005 EHP)
  – Reduced food packaging
    (Rudel et al., 2011 EHP)
  – 5-Day vegetarian diet – temple stay
    (Ji et al., 2010 Env Res)

• For household products – we first need to ID major sources and substitutes
50 product types
66 endocrine disruptors and asthma-associated chemicals

<table>
<thead>
<tr>
<th>Endocrine disrupting compounds</th>
<th>Asthma associated</th>
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<tbody>
<tr>
<td>parabens</td>
<td>phthalates</td>
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<tr>
<td>triclosan</td>
<td>fragrances</td>
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<td>alkylphenols</td>
<td>glycol ethers</td>
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<td>UV filters</td>
<td>ethanolamines</td>
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<td>cyclosiloxanes</td>
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<td>BPA</td>
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<td>Chemical Class</td>
<td>Use(s) in Products&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>parabens</td>
<td>preservative; anti-microbial agent</td>
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<tr>
<td>phthalates</td>
<td>plastic additives; solvents in cosmetics and perfumes; inert ingredient in pesticides</td>
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<tr>
<td>bisphenol A</td>
<td>production of polycarbonate plastic and epoxy resins</td>
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<tr>
<td>antimicrobials</td>
<td>anti-microbial agent</td>
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<td>ethanolamines</td>
<td>solvent in cleaners; emulsifier in creams and lotions</td>
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<td>Chemical Class</td>
<td>Use(s) in Products</td>
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<tr>
<td>alkylphenols</td>
<td>surfactant; disinfectant; inert ingredient in pesticides</td>
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<tr>
<td>fragrances</td>
<td>scent; masking agent</td>
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<td>Chemical Class</td>
<td>Use(s) in Products&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>glycol ethers</td>
<td>solvent</td>
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<tr>
<td>perfluorinated</td>
<td>stain resistance</td>
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<td>cyclosiloxanes</td>
<td>enhance conditioning and spreading</td>
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<tr>
<td>UV filters</td>
<td>skin protection; product stability and durability</td>
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<sup>a</sup> General use categories obtained from the NLM Hazardous Substance Data Bank and/or scientific literature.

<sup>b</sup> Health effects have not necessarily been reported for all chemicals within the chemical class. Among the EDCs in this study, phthalates are the only chemical group for which there is supporting evidence of health effects from human studies. All asthma-associations are derived from human studies.

<sup>c</sup> Natural fragrances are readily available from plant materials, but can also be synthesized. Stereoisomer composition will differ for chemically synthesized materials. Our analysis did not determine whether these were synthesized or derived from plant materials.

R2 indicates chemicals added during the second round of sampling.

Italicized chemicals were not detected in any sample.
Study design

170 Conventional products composited to represent 42 product types – increase generalizability

43 Alternative products analyzed individually – increase specificity

– Limited ability to compare detection frequency and concentration between conventional and alternative
“Alternative” Product Criteria (labels did not indicate presence of):

- parabens
- ethanolamines
- 1,4-dichlorobenzene
- nonionic surfactants
- fragrances ("natural" fragrances or essential oils permitted in some cases)
- tea tree oil, lavender
- triclosan, triclocarban, antimicrobial, antibacterial
- stain-resistant characteristics
- vinyl
- petroleum-based

and met selection criteria for a nation-wide natural food store
Summary of findings

• Detected 55 chemicals
  – All conventional
  – 32/43 alternative

• Highest concentrations: DEHP, fragrance, DEA, glycol ethers, UV filters

• Largest # and highest concentrations: sunscreens and fragranced products

• Vinyl products – up to 28% DEHP by weight

• Substitutions?
Mixtures

- Zero to 22 in single product type
- Correlation analysis
- Surface cleaner + tub and tile + laundry detergent + bar soap + shampoo and conditioner + facial cleanser and lotion + toothpaste = 19 target chemicals
- Implications:
  - Toxicity testing
  - Risk assessment
  - Epidemiology
Label analysis

• It is possible to avoid some target chemicals through label reading but not all

• Generally not:
  – phthalates, ethanolamines, alkylphenols

• Generally yes:
  – parabens, antimicrobials, UV filters
Conclusions and Implications

• Exposures add up for multiple products
• Tox studies and risk assessment needed for mixtures
• For epidemiology, findings raise concerns
  – confounding from co-occurring chemicals (e.g. DEP a marker for fragrance)
  – misclassification due to variation in product composition (self-report)
• Labels facilitate consumer choice for regulated active ingredients, synthetic fragrance, and BPA
• Intervention to reduce exposure – focus on vinyl, fragranced products, reducing number of different products used, alternatives to sunscreen (e.g., shade)
The study was funded by the U.S. Centers for Disease Control and Prevention, the Goldman Fund, and Hurricane Voices Breast Cancer Foundation.
'Safer' products often contain harmful chemicals, tests show

By Wendy Koch, USA TODAY

Consumer products such as babyfoods or baby wipes that are labeled as "safer" today that tested dozens of products from leading brands for potentially harmful chemicals. The products were tested for Bisphenol A (BPA) and other endocrine-disrupting chemicals. The results were released last month.

Asthma Health Center

Questionable Chemicals Found in Household Products

Many in Industry Question Study's Findings, Say Fears Unfounded

By Kathleen Doherty
WebMD Health News

March 8, 2012

On the list:

"Consumer associated chemicals" studies links between the

Bisphenol A And Other Endocrine Disruptors Found In Common Household Products

The Huffington Post | By Sarah Rees | 2012

Edition: U.S.

HuffPost Healthy Living

The Internet Newspaper: News Blogs Video Community

This is the print preview. Back to normal view

Hormone-Disrupting Chemicals Found in Many Household Products: Study

These ingredients also found in some 'alternative' brands, researchers say

March 8, 2012

By Jenifer Goodwin
HealthDay Reporter

THURSDAY, March 8 (HealthDay News) -- Tests of more than 200 common household items that research suggests may be linked to asthma and hormone disruption, res
Top Tips

**CHOOSE**

✓ Fewer products
✓ Plant-based ingredients
✓ Plain water, baking soda and vinegar for cleaning
✓ Shade, hats and tightly woven fabric cover-ups for sun protection
Top Tips

**AVOID**

- **Fragrances** in cleaning and personal care products
- **Vinyl** products, especially pillows and mattress-protectors
- **Antimicrobials** in soap, toothpaste and other products (watch out for “antibacterial,” “antimicrobial,” “triclosan” and triclocarban” on the label)
Top Tips

AVOID

- **Stain resistant** furniture sprays or clothing
- **Lavender and tea tree oil**
- **Parabens** in lotions, deodorants, shampoos and other cosmetics (look for “paraben-free” and watch out for “methylparaben,” “ethylparaben” and “butylparaben”)
- **Cyclosiloxanes** in sunscreen and hair products (watch out for “cyclomethicone”)

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