Safer Cleaning Products and Asthma: Tips and Resources for Health Professionals

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Asthma affects more than 5 million children in the United States, or roughly 7% of the population under the age of 18y.[1] Pediatric providers suggest avoidance of asthma triggers . like smoking,[1] pets, or mold. However, one important trigger found in nearly every home is too often excluded from this counseling: *household cleaning products*. The link between occupational and home exposures to cleaning products and adult asthma has been well-established, raising concerns about their contribution to asthma risk and severity in children. An in-depth review of the [2,3,4] Third National Health and Nutrition Examination Survey (NHANES) found that 27% of work-related asthma in adults is attributable to equipment cleaning and cleaning product use in general.[2] A survey of almost 550 healthcare workers demonstrated that nurses exposed to cleaning products containing quaternary ammonium compounds (QACs) had a significantly increased risk of asthma diagnosis.[3] Emerging research suggests similar risks may exist in children. A 2020 Canadian study surveyed the homes of over 2,000 children and assessed household cleaning product use. Children in households with higher frequency of cleaning product use demonstrated significantly higher rates of asthma diagnosis.[5] These findings present an interesting dichotomy for pediatricians when providing guidance on avoidance of asthma triggers. Cleaning products may be recommended for eliminating dust, mold, or pests, but the chemicals in these products can also exacerbate asthma. Thus, it is important to counsel families both on maintaining a clean environment and the selection of healthier alternatives. Adequate training in this area for clinicians and resources for patients is lacking. Medical school and residency curricula frequently leave pediatric providers underprepared to provide environmental health screening or counseling. To address this knowledge gap, in this article we: (1) summarize pediatric health risks from cleaning and disinfecting products; (2) highlight "safer" cleaning and disinfecting ingredients and which chemicals should be avoided; (3) provide practical tips on effective communication of anticipatory guidance about safer cleaning; and (4) share trusted resources that providers can utilize when consulted by school officials or families about safety profiles and health risks for specific chemicals (5) present an informational, family-focused brochure and poster that we developed for a pediatric pulmonology clinic through the New York State Children's Environmental Health Center (NYSCHECK) training program in environmental health. The COVID-19 pandemic brought the issue of unsafe cleaning chemical exposures to the forefront.

As household cleaner and disinfectant use rose sharply, there was a simultaneous rise in calls to Poison Control to report adverse events following exposure, with children under the age of 5 years representing nearly half of all calls.[7] For this reason, it is paramount that caregivers be aware of the potential risks and harms associated with use of these products. Health professionals can play a vital role in providing patient guidance regarding safer cleaning practices. Providers should initiate a discussion with the caregiver during an office visit by inquiring about which types of products they typically use to clean their homes, especially in patients with asthma. This can be incorporated early on in the patient encounter, when screening and counseling regarding other household exposures that may affect a child's asthma such as dust, mold, and pets takes place. The provider should ensure that the patient understands that chemicals in many common household cleaning products can exacerbate a child's respiratory symptoms, and provide information on safer products and practices. Patients may cite cost and availability as barriers to switching to safer alternative products. Fortunately, safer disinfecting products, such as hydrogen peroxide and isopropyl alcohol, can be readily found in neighborhood drug stores and grocery stores at prices comparable to less safe products. Caregivers should be advised in the judicious use of disinfectants containing the safer active ingredients hydrogen peroxide, alcohol, lactic acid, citric acid, or caprylic (octanoic) acid.[6] Products labeled with the Green Seal, EcoLogo, EPA Safer Choice,or USDA Biopreferred logo are all certified as non-carcinogenic, environmentally friendly, and safe for pregnancy.[6] Safe and effective cleaners can also be made from food grade products commonly found in the home (Figure 1).

Figure 1.

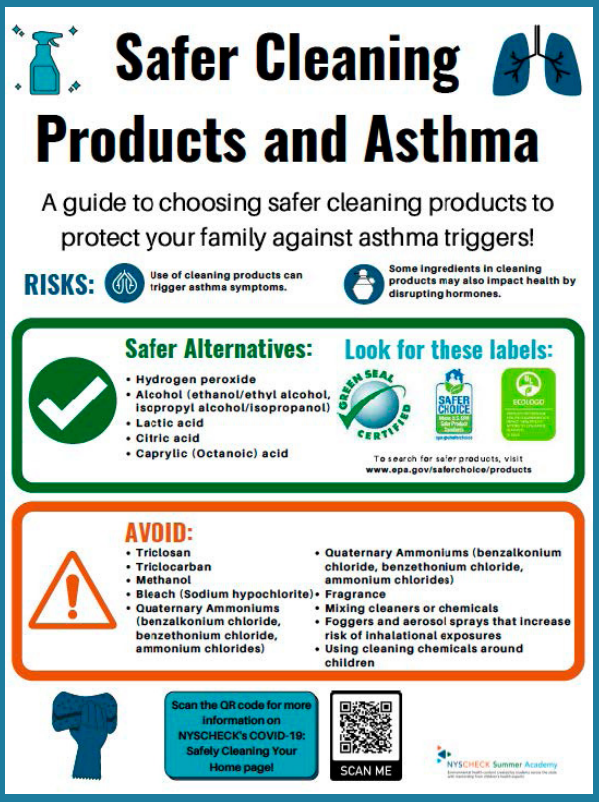
Figure 1. Recipes for safe and effective cleaning products that can be made at home.

To address gaps in provider education on the hazards of cleaning and disinfecting products, we participated in the 2021 NYSCHECK Children's Environmental Health Summer Training Institute and created an informational, family-friendly brochure and poster for anticipated use in two Boston Childrens' Hospital pediatric pulmonology clinics in West Harrison and Hawthorne, NY. Throughout this eight week training program, students from all across New York State received didactic training in clinically relevant environmental health topics and worked to develop actionable messaging on the health risks associated with cleaning chemicals. Recognizing the gap in provider education on this topic, we sought to develop an accessible resource for pediatric providers to utilize for patient counseling. To this end, we created a brochure detailing: health risks associated with cleaning products, chemicals and practices to avoid, safer alternatives, at-home cleaning recipes, common myths and facts about cleaning chemicals, and links to additional resources from NYSCHECK and USEPA. In addition, we created a poster in order to visually display this information in the pediatric pulmonology clinic waiting room (Figure 2).

These resources are freely available for download and printing at https://nyscheck.org/covid-safely-cleaning-your-home/.

Provider and patient knowledge about safer cleaning products is both important and timely. A brief discussion about chemicals in household cleaners can easily be added to asthma trigger counseling. By increasing caregiver awareness of this issue and providing easy-to-read resources for safer chemical use, healthcare professionals can play a valuable role in helping families adopt healthier cleaning habits to protect children with asthma.

2a)



2b)

Figure 2. Snapshots of Safer Cleaning Products and Asthma waiting room poster (a) and brochure (b). Available for download at https://nyscheck.org/covid-safely-cleaning-your-home/ (see "Partner Resources").

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The mission of NYSCHECK is to prevent, diagnose, and treat environmentally related conditions for families across New York State. As the first state-based model for pediatric environmental health services in the country, New York now has dedicated pediatric champions across the state working together to protect and promote children's health and the environment through clinical consultations, environmental health screening, education and training, and community partnerships.

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The content of this manuscript is the responsibility of the authors and does not necessarily represent the official views of ATSDR, USEPA, or NYS DOH. For additional information on safer cleaning and disinfecting:

New York State's Children Environmental Centers:
https://nyscheck.org/covid-safely-cleaning-your-home/
https://nyscheck.org/rx/

US EPA Safer-choice Certified Products:
https://www.epa.gov/saferchoice/products

Pediatric Environmental Health Specialty Units:
https://www.pehsu.net/Safer_Disinfectants.html
https://wspehsu.ucsf.edu/projects/safer-disinfecting-during-the-covid-19-pandemic/

American Academy of Pediatrics
https://www.healthychildren.org/English/health-issues/conditions/prevention/Pages/Cleaners-Sanitizers-Disinfectants.aspx

ABSTRACT
Asthma currently affects 5.1 million children in the United States (7% of population age <18y) Pediatric providers frequently discuss avoidance of asthma triggers. However, one important trigger, found in nearly every home, is too often excluded from this counseling- household cleaning products. The link between adult asthma and cleaning product use in the home and occupationally has been well studied. Research also suggests that cleaning products may exacerbate asthma in children as well. Health professionals hold a vital role in bringing attention to this matter among their patients and providing guidance regarding safer cleaning practices. However, medical school and residency curricula frequently leave pediatric providers underprepared to provide environmental health screening or counseling. We present a case study for how an informational, family-focused brochure and poster were developed for

a pediatric pulmonology clinic. The goals of these materials are to raise awareness for the harms associated with some cleaning chemicals, encourage use of products from a "safer" list, and provide a recipe for a safe homemade cleaning product.

In this article, we: (1) summarize pediatric health risks from cleaning and disinfecting products; (2) highlight "safer" cleaning and disinfecting ingredients and which chemicals should be avoided; (3) provide practical tips on effective communication of anticipatory guidance about safer cleaning; and (4) share trusted resources that providers can utilize when consulted by school officials or families about safety profiles and health risks for specific chemicals.

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