

## Disinfectant & Pesticide Use During COVID-19

**Protect patients and staff by avoiding disinfectants containing respiratory-irritating toxic substances. Instead, choose safer effective disinfectants.**

Many disinfectants on EPA's List N for institutional use against SARS-CoV-2 contain the active ingredient Quaternary ammonium. **Quaternary ammonium compounds (QAC)** are registered with the EPA as pesticides and increasingly are being found to cause serious health effects. Mount Sinai Selikoff Centers for Occupational Health report on [Quaternary Ammonium Compounds for health professionals](#) cautions QAC exposure from cleaning products for **triggering asthma symptoms even in people with no prior asthma history**, among other serious harmful impacts.

**Chlorine-based disinfectants** also cause respiratory irritation and illness. (see sidebar) [Nurses' regular use of disinfectants is associated with developing COPD, 24-32% higher.](#)

### AVOID and replace disinfectants and cleaners containing these chemicals:

- ✗ Quaternary ammonium compounds  
Label does not specify a substance is a QAC but often ends in "ammonium chloride"  
Most common QAC in disinfectants are the **Benzalkonium chlorides**.
- ✗ Chlorine compounds / Bleach  
(sodium hypochlorite, hypochlorous acid, sodium chlorite & sodium chloride)
- ✗ Sodium Dichloro-S-Triazinetrione

- ✗ Ammonium Carbonate
- ✗ Ammonium Bicarbonate
- ✗ Peroxyacetic acid (peracetic acid)
- ✗ Glutaraldehyde
- ✗ Glycolic acid
- ✗ Hydrochloric acid
- ✗ Octanoic acid

**WARNING: Do not mix products.** Mixing bleach with vinegar, ammonia or alcohol is very toxic. Clean surface dirt and rinse before disinfecting.

### CHOOSE SAFER disinfectant ingredients approved by CDC and EPA N List:

- ✓ Hydrogen peroxide
- ✓ Isopropyl alcohol / isopropanol
- ✓ Ethanol
- ✓ Thymol
- ✓ L-lactic acid
- ✓ Citric Acid

Contact times vary, read label.

### Finding Safer Disinfectant Products

**SEARCH the EPA List N database to find safer disinfectant products:**

[Use this link](https://bit.ly/2wQMIG5) (https://bit.ly/2wQMIG5) to access database, scroll down page to Search Table of List N products by Active Ingredient, input active ingredient from SAFER list. Eliminate product results with active ingredients that are listed in AVOID list (above).

**Or download these PDF files of List N products with safer active ingredients:**

- ✓ Isopropol/isopropanol - Klercide 70/30 IPA, EcoLab Inc. or other 70/30
- ✓ Hydrogen peroxide – [Download the product list](#)
- ✓ Ethanol product – [Download the product list](#)
- ✓ Thymol – [Download the product list](#)
- ✓ L-lactic acid – [Download the product list](#)
- ✓ Citric Acid – [Download the product list](#)

When using downloaded PDF lists, only choose products with YELLOW highlight on Active Ingredients, DO NOT USE PRODUCTS with AVOID active ingredients.

### Respiratory Impacts & Disinfectants

"Chlorine gas is a pulmonary irritant with intermediate water solubility that causes acute damage in the upper and lower respiratory tract. Exposure to low concentrations of chlorine for prolonged periods may have destructive effects, as might very short-term exposure to high concentrations." <sup>1</sup>

"Many pesticides (disinfectants) are sensitizers or irritants capable of directly damaging the bronchial mucosa, thus making the airway very sensitive to allergens or other stimuli. Pesticides may increase the risk of developing asthma, exacerbate a previous asthmatic condition or even trigger asthma attack by increasing bronchial hyper-responsiveness." <sup>2</sup>

According to a 2019 analysis of the EPA Pesticide Product Labeling System and other studies, published in the *American Journal of Infection Control (AJIC)*, **asthma occurs at higher rates in adults who use disinfectants and cleaners regularly for their jobs**—such as janitors and healthcare workers—than in other workers. <sup>3</sup>

*Consumer Reports* issued a warning about using **disinfecting wipes because they contain EPA-registered pesticides**, which can be hazardous to young children and states... "Recent increases in the concentration of EPA-registered bleach products make diluting bleach correctly more confusing and difficult. More concentrated bleach products also expose staff to more bleach vapors when using the products." <sup>4</sup>

- The California Department of Pesticide Regulation outlines **asthma-related concerns related to using bleach as disinfectant:** <https://bit.ly/2V5Je6B>

<sup>1</sup> Gerald F O'Malley, Chlorine Toxicity, Medscape, Updated May 13, 2019

<sup>2</sup> Hernandez AF, Parron T, Alarcon R., Pesticides and asthma. *Curr Opin Allergy Clin Immunol.* 2011 Apr;11(2):90-6

<sup>3</sup> Catherine Roberts, [Why Parents Should Be Cautious When Using Household Disinfectants](#), *Consumer Reports* Feb 05, 2020

<sup>4</sup> *Consumer Reports (CR)*, 2013 update: Bleach-free Disinfection and Sanitizing for Child Care, Green Cleaning, Sanitizing, and Disinfecting: A toolkit for Early Care and Education,

# Respiratory-impacting Pesticides Used for Pest Management May Complicate Treatment for COVID-19 Patients

*The following information is to help ensure your health care facility is free from pesticides that can create and/or exacerbate adverse respiratory impacts, by incorporating an IPM (Integrated Pest Management) strategy.*

## Integrated Pest Management (IPM)

A prioritized IPM strategy, focused on non-chemical pest prevention and intervention, only using least toxic pesticides as a last resort, reduces unnecessary pesticide applications and significantly reduces pesticide exposures, especially the exposure related with respiratory outcomes.

Especially during this pandemic, ensuring housekeeping and maintenance departments are addressing sources of pest pressures is key. Least-toxic pesticides are used only as a last-resort.

## Recommended strategic action: Shift away from pesticides that fall into the following classifications.

Under ordinary circumstances, the following classes of pesticides are not part of a defined IPM program, but especially during this pandemic we recommend safer practices and products as **the following classes of pesticides can exacerbate respiratory issues in COVID-19 patients**. Your vendor can identify if they have been/are using these.

**We can assist with recommendations for safer alternatives.**

**Organophosphates & Carbamates:** These common insecticides cause acute muscarinic manifestations (e.g. salivation, lacrimation, urination, diarrhea, emesis, **bronchorrhea, bronchospasm**, bradycardia, miosis) ... Respiratory findings include ...wheezing, and hypoxia [low oxygen in tissues] which may be severe.<sup>5</sup>

**Synthetic Pyrethroids:** These are excitatory nerve poisons and known carcinogens.<sup>6</sup> Synthetic pyrethroids are frequently used as commercial pesticides to control pest insects in hospitals. Symptoms of acute toxicity and exposure due to absorption through the gut and **pulmonary membrane** has resulted in contact dermatitis and **asthma-like reactions including** – sneezing, nasal stuffiness, headache, nausea, incoordination, tremors, convulsions, facial flushing and swelling, and burning and itching sensations. **The most severe poisonings have been reported in infants**, which include excitation and convulsions leading to paralysis, accompanied by muscular fibrillation and diarrhea. **Death in these cases is due to respiratory failure.**<sup>7</sup>

## Commonly used toxic pesticides in healthcare facilities that may impact respiratory outcomes:

- Steri-Fab 397-13<sup>8</sup> – often used to eliminate bed bugs, ants, flies, and cockroaches
- TruPower 3 228-551<sup>9</sup> – often used to control ants and cockroaches
- EcoPCO AR.X Aerosol Insecticide<sup>10</sup> – often used to eliminate cockroaches, ants
- Talstar<sup>11</sup> – often used for ants, bees, flies, stink bugs, spiders, mosquitoes

We urge facilities to ensure they are using proper maintenance and housekeeping practices that reduces pest pressures and during this pandemic especially using the safest effective disinfectant products. More questions? Contact us today for fact sheets, resources and to ask experts your questions on implementing a high-level, prioritized IPM Program to protect your facility, staff and patients.

**Our team at the [IPM in Health Care Facilities Project](#) provides pro-bono consulting, training and resources throughout the year to healthcare facilities. Contact Gina Navarro, project director, [gnavarro@mdpestnet.org](mailto:gnavarro@mdpestnet.org) or call 443-465-4845 for information.**

<sup>5</sup> Merck Manual, [Organophosphate Poisoning and Carbamate Poisoning](#); <sup>6</sup> [Pesticide Action Network \(PAN\) Database](#), Pesticides and human health; <sup>7</sup> [Beyond Pesticides](#), Extension Toxicology Network (ENT), 1994, Pyrethroids. "Pesticide Information Profiles"; <sup>8</sup> Steri Fab/ OSHA HCS Safety Data Sheet, 05/2015; <sup>9</sup> TruPower 3 / Nufarm Material Safety Data Sheet; <sup>10</sup> EcoPCO AR.X, Material Safety Data Sheet; <sup>11</sup> Talstar Professional Insecticide, Material Safety Data Sheet