

Bleach + Other Cleaners = Trouble!

“HELP! I mixed bleach and ammonia together to clean my bathroom and now I can't stop coughing!”

This is a typical call that comes into the Maryland Poison Center almost every day. Many people believe that mixing bleach with ammonia or other cleaners will result in a “super” cleaner. Unfortunately what they find is that the mixture results in gases being formed that are respiratory and mucous membrane irritants.

Liquid household chlorine bleach contains approximately 5% sodium hypochlorite. When mixed with ammonia, **chloramine** gas is produced. A single acute exposure to chloramine gas in the home results in coughing, choking, a burning sensation in the chest and dyspnea. Chemical pneumonitis, pulmonary edema and respiratory failure can occur following severe gas exposure. Mucous membrane irritation and eye irritation (burning, lacrimation and eyelid edema) are common. Some patients may also experience nausea, vomiting, diaphoresis and headache.

Some household and industrial cleaners, such as toilet bowl cleaners, contain strong acids (sulfuric acid, hydrochloric acid and others). When mixed with hypochlorite-containing bleach, **chlorine** gas is formed. Most exposures that occur at home due to the mixing of cleaners result in mild symptoms similar to what occurs with chloramine inhalation. However, severe or prolonged exposures may result in marked respiratory distress, acute lung injury and hypoxemia.

Most exposures to chloramine or chlorine gas in the home do not require any therapy beyond fresh air. Symptoms usually resolve within 6 hours; however, some patients may complain of mild, lingering effects for up to 24 hours. Patients with severe respiratory symptoms should be evaluated in the emergency department. Administer oxygen and assist ventilation as required. Bronchospasm should be treated with inhaled beta₂ agonists and oral or parenteral corticosteroids. Monitor the patient's respiratory function for several hours to assure that acute lung injury does not develop.

Call the **Maryland Poison Center** for help in diagnosing and managing exposures to household cleaners.

DID YOU KNOW THAT... mixing bleach with other chemicals can result in the formation of other noxious gases?

Chemicals such as hydrogen peroxide, ammonium salts, metals and solvents should not be mixed with bleach that contains sodium hypochlorite. A sodium hypochlorite incompatibility chart can be found at the Chlorine Institute's website at www.chlorineinstitute.org/files/FileDownloads/SodiumHypochloriteIncompatibilityChart-English.pdf.

