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Formaldehyde and Cancer Risk

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What is formaldehyde?

Formaldehyde is a common colorless, strong-smelling chemical that is a gas at room temperature. It occurs naturally in the environment, including in some foods (and even inside our bodies), but it is also a widely used chemical in some industries. For example, it is used in making building materials and many household products, including:

- Pressed-wood products, such as particleboard, plywood, and fiberboard
- Glues and adhesives
- Permanent-press fabrics
- Paper product coatings
- Certain insulation materials

When dissolved in water it is called *formalin*, which is commonly used as an industrial disinfectant and as a preservative in funeral homes and medical labs. It can also be used as a preservative in some products, such as antiseptics, medicines, and cosmetics. Sometimes, even when formaldehyde is not an ingredient in a product, substances that release formaldehyde are. These have been found in cosmetics, soaps, shampoos, lotions and sunscreens, and cleaning products.

While formaldehyde is found naturally in small amounts in some foods (including fruits),

it can also be added as a preservative to food, as well as being produced as a result of cooking and smoking.

Humans and most other living organisms also make small amounts of formaldehyde as part of normal metabolic processes.

How are people exposed to formaldehyde?

People can be exposed to formaldehyde by:

- ~~Inhaling it (the main way people are exposed)~~

installed many years ago are not likely to have high formaldehyde levels now.

Exposure at work

Workers in industries that make formaldehyde or formaldehyde-containing products, lab technicians, some health care professionals, funeral home employees, and hair salon workers may be exposed to higher levels of formaldehyde than the general public. Exposure occurs mainly by inhaling formaldehyde gas or vapor from the air or less often by absorbing liquids containing formaldehyde through the skin.

Can formaldehyde cause cancer?

What studies have found

Researchers use 2 main types of studies to try to figure out if something causes cancer:

- **Lab studies** (studies done using lab animals or cells in lab dishes)
- **Studies in people**

Exposure to formaldehyde has been shown to cause cancer in lab animals. Exposure to relatively high amounts of formaldehyde in medical and other workplaces has been linked to some types of cancer in humans, but the effect of exposure to small amounts is less clear.

Studies in the lab

In rats, inhaled formaldehyde has been linked to cancers inside the nose and to leukemia. Formaldehyde given in drinking water has been linked with an increase in tumors in the stomach and intestines.

Applying formaldehyde to the skin of lab animals has also been linked to quicker development of cancers caused by other chemicals.

Studies in people

Some, but not all, studies of people exposed to formaldehyde in the workplace have reported a link between formaldehyde exposure and [cancer of the nasopharynx](#)³ (the upper part of the throat, behind the nose). These studies looked at people who work in

places that use or make formaldehyde and formaldehyde resins, as well as at people who work as embalmers.

Studies of people exposed to formaldehyde at work have also found a possible link to [cancer of the nasal sinuses](#)⁴.

Several studies have found that embalmers and medical professionals who use formaldehyde have an increased risk of [leukemia](#)⁵, particularly myeloid leukemia. Some studies of industrial workers exposed to formaldehyde have also found increased risks of leukemia, but not all studies have shown an increased risk. One study found that workers exposed to formaldehyde had higher than normal levels of chromosome changes in early forms of white blood cells in their bone marrow. This finding supports the possible link between formaldehyde exposure and leukemia.

Studies looking at possible links between workplace exposure to formaldehyde and other types of cancer have not found a consistent link.

What expert agencies say

Several national and international agencies study different substances in the environment to determine if they can cause cancer. (A substance that causes cancer or helps cancer grow is called a *carcinogen*.) **The American Cancer Society looks to these organizations to evaluate the risks based on evidence from lab, animal, and**

exposure." The EPA states that evidence demonstrates an increased risk of nasopharyngeal cancer, nasal sinus cancer, and myeloid leukemia, and evidence suggests an increased risk for some other types of cancer.

(For more information on the classification systems used by some of these agencies, see [Determining if Something Is a Carcinogen⁶](#).)

Does formaldehyde cause any other health problems?

When formaldehyde is present in the air at levels higher than 0.1 parts per million (ppm), some people may have health effects, such as:

- Watery eyes
- Burning sensations of the eyes, nose, and throat
- Coughing
- Wheezing
- Nausea
- Skin irritation

Some people are very sensitive to formaldehyde, while others might have no reaction to the same level of exposure.

Formaldehyde in consumer products such as cosmetics and lotions can cause an allergic reaction in the skin (allergic contact dermatitis), which can lead to an itchy, red rash that may become raised or develop blisters.

How can I limit my exposure to formaldehyde?

In the home

The EPA recommends using "exterior-grade" pressed-wood products to limit

acceptable formaldehyde emission standards.

Formaldehyde levels in homes can also be reduced by not allowing smoking inside and by ensuring adequate ventilation (such as using your stove vent fan), moderate temperatures, and reduced humidity levels through the use of air conditioners and dehumidifiers.

People who are concerned about formaldehyde exposure from personal care products and cosmetics can avoid using products that contain or release formaldehyde.

Formaldehyde can be listed on a product label by many other names, such as:

- Formalin
- Formic aldehyde
- Methanal
- Methyl aldehyde
- Methylene glycol
- Methylene oxide

Some chemicals that are used as preservatives can release formaldehyde, such as:

- Benzylhemiformal
- 2-bromo-2-nitropropane-1,3-diol
- 5-bromo-5-nitro-1,3-dioxane
- Diazolidinyl urea
- 1,3-dimethylol-5,5-dimethylhydantoin (or DMDM hydantoin)
- Imidazolidinyl urea
- Sodium hydroxymethylglycinate
- Quaternium-15

In the workplace

The US Occupational Safety and Health Administration (OSHA) has established limits for the amount of formaldehyde that workers can be exposed to at their place of work. At present the limit is at 0.75 ppm on average over an 8-hour workday. The highest concentration that a worker can be exposed to is 2 ppm, and that can only occur over 15 minutes.

clothing as needed to limit exposure. This includes any workplace where formaldehyde exposure is likely, including hair salons that use commercial hair smoothing products that release formaldehyde.

Hyperlinks

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