gasp colorado

Group To Alleviate Smoking Pollution

Advocating for smoke-free policies since 1977

# Hazardous Chemicals in Secondhand Marijuana Smoke

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| **33 Chemicals That Can Cause Cancer**<br>"Many of the chemical constituents that have been identified in marijuana smoke are carcinogens." | "The following 33 marijuana smoke constituents included in Table 1 are listed under Proposition 65 as causing cancer: acetaldehyde, acetamide, acrylonitrile, 4-aminobiphenyl, arsenic, benz[a]anthracene, benzene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene, benzofuran, 1,3-butadiene, cadmium, carbazole, catechol, chromium (hexavalent compounds), chrysene, dibenz[a,h]anthracene, dibenz[a,i]pyrene, dibenzo[a,e]pyrene, diethylnitrosamine, dimethylnitrosamine, formaldehyde, indeno[1,2,3,-c,d]pyrene, isoprene, lead, mercury, 5-methylchrysene, naphthalene, nickel, pyridine, and quinoline."<br>2009 OEHHA document, Evidence on the Carcinogenicity of Marijuana Smoke |
| **Hydrogen Cyanide**<br>Is the same chemical used for chemical weapons. | Hydrogen Cyanide interferes with the normal use of oxygen by nearly every organ of the body. Exposure to hydrogen cyanide (AC) can be rapidly fatal. It has whole-body (systemic) effects, particularly affecting those organ systems most sensitive to low oxygen levels: the central nervous system (brain), the cardiovascular system (heart and blood vessels), and the pulmonary system (lungs). Hydrogen cyanide (AC) is a chemical warfare agent (military designation, AC). |
| **Ammonia**<br>Household cleaner used on floors and toilets. There is 3 times more in secondhand marijuana smoke than tobacco smoke. | Ammonia gas is a severe respiratory tract irritant. Can cause severe irritation of the nose and throat. Can cause life-threatening accumulation of fluid in the lungs (pulmonary edema). Symptoms may include coughing, shortness of breath, difficult breathing and tightness in the chest. Symptoms may develop hours after exposure and are made worse by physical effort. Long-term damage may result from a severe short-term exposure. |
| **Cadmium**<br>A poisonous chemical found in car batteries that can cause liver, kidney, or brain damage. | The acute (short-term) effects of cadmium in humans through inhalation exposure consist mainly of effects on the lung, such as pulmonary irritation. Chronic (long-term) inhalation or oral exposure leads to a build-up of cadmium in the kidneys that can cause kidney disease. It has been shown to be a developmental toxicant in animals, resulting in fetal malformations and other effects, but no conclusive evidence exists in humans. An association between cadmium exposure and an increased risk of lung cancer has been reported from human studies, but these studies are inconclusive |

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| | due to confounding factors. Animal studies have demonstrated an increase in lung cancer from long-term inhalation exposure to cadmium. EPA has classified cadmium as a Group B1, probable human carcinogen |
| Formaldehyde<br>Used to embalm dead bodies. | When exposed to formaldehyde, some individuals may experience various short-term effects. Formaldehyde has been classified as a known human carcinogen (cancer-causing substance) by the International Agency for Research on Cancer and as a probable human carcinogen by the U.S. Environmental Protection Agency. Research studies of workers exposed to formaldehyde have suggested an association between formaldehyde exposure and several cancers, including nasopharyngeal cancer and leukemia. |
| Acetone<br>Used as a paint stripper and for nail polish. | Exposure can cause headaches; dizziness; and irritated eyes, skin, and throat. |
| Arsenic<br>A known poison used as a pesticide or pest and insect control. | Arsenic exposure in the workplace occurs through inhalation, ingestion, dermal or eye contact. Chronic exposure to arsenic leads to distinct skin diseases, such as arsenical keratinosis, which is characterized by excessive formation of scaly skin on the palms and soles; darkened patches of skin; wart formation; skin lesions; acne; and increased risk of skin cancers. Chronic arsenic poisoning can also cause sudden constriction in arteries or veins, reducing blood flow; decreased nerve function; lung, liver, kidney and bladder, and other cancers. Acute exposures can cause lung distress and death. |

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| Benzene<br>Poisonous toxin found in emissions from gasoline, coal, oil, car exhausts. | Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans occupationally exposed to benzene. EPA has classified benzene as known human carcinogen for all routes of exposure |
| Toulene<br>An industrial solvent added to gasoline. | Exposure to toluene may occur from breathing ambient or indoor air affected by such sources. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to elevated airborne levels of toluene; symptoms |

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| | include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to high levels of toluene or mixed solvents by inhalation. EPA has concluded that that there is inadequate information to assess the carcinogenic potential of toluene. |
| Nickel | Nickel dermatitis, consisting of itching of the fingers, hands, and forearms, is the most common effect in humans from chronic (long-term) skin contact with nickel. Respiratory effects have also been reported in humans from inhalation exposure to nickel. Animal studies of soluble nickel compounds (i.e., nickel carbonyl) have reported lung tumors. EPA has classified nickel refinery dust and nickel subsulfide as Group A, human carcinogens, and nickel carbonyl as a Group B2, probable human carcinogen. |
| Chromium<br>Used to make steel. | Can cause nose and throat irritation. |
| Lead | Can be toxic to humans and animals. |

## Resources:

*David Moir, William S. Rickert, Genevieve Levasseur, Yolande Larose, Rebecca Maertens, Paul White, and Suzanne Desjardins. A Comparison of Mainstream and Sidestream Marijuana and Tobacco Cigarette Smoke Produced Under Two Machine Smoking Conditions. Chem. Res. Toxicol, Published on Web 12/07/2007*

*Health and Safety Code section 25249.8(b) and Title 27, Cal Code of Regs., section 25302 et seq. Accessed online at: oehha.ca.gov/prop65/hazard_ident/pdf_zip/FinalMJsmokeHID.pdf*

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Information on secondhand marijuana smoke