New substances added to HHS Report on Carcinogens

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The U.S. Department of Health and Human Services today added eight substances to its Report on Carcinogens, a science-based document that identifies chemicals and biological agents that may put people at increased risk for cancer.

The industrial chemical formaldehyde and a botanical known as aristolochic acids are listed as known human carcinogens. Six other substances – captafol, cobalt-tungsten carbide (in powder or hard metal form), certain inhalable glass wool fibers, o-nitrotoluene, riddelliine, and styrene – are added as substances that are reasonably anticipated to be human carcinogens. With these additions, the 12th Report on Carcinogens now includes 240 listings. It is available at ntp.niehs.nih.gov/go/roc12 .

"Reducing exposure to cancer-causing agents is something we all want, and the Report on Carcinogens provides important information on substances that pose a cancer risk," said Linda Birnbaum, Ph.D., director of both the National Institute of Environmental Health Sciences (NIEHS) and the National Toxicology Program (NTP). "The NTP is pleased to be able to compile this report."

John Bucher, Ph.D., associate director of the NTP added, "This report underscores the critical connection between our nation's health and what's in our environment."

The Report on Carcinogens is a congressionally mandated document that

is prepared for the HHS Secretary by the NTP. The report identifies agents, substances, mixtures, or exposures in two categories: known to be a human carcinogen and reasonably anticipated to be a human carcinogen. A listing in the Report on Carcinogens does not by itself mean that a substance will cause cancer. Many factors, including the amount and duration of exposure, and an individual's susceptibility to a substance, affect whether a person will develop cancer.

Once a substance is nominated by the public or private sector and selected for consideration, it undergoes an extensive evaluation with numerous opportunities for scientific and public input. There were at least six opportunities for public input on each substance. The NTP used established criteria to evaluate the scientific evidence on each candidate substance under review. The NTP drew upon the scientific expertise of several federal agencies, including the National Institutes of Health, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, U.S. Food and Drug Administration, U.S. Environmental Protection Agency, U.S. Consumer Product Safety Commission, and Occupational Safety and Health Administration.

"The strength of this report lies in the rigorous scientific review process," said Ruth Lunn, Dr.P.H., director of the NTP Office of the Report on Carcinogens. "We could not have completed this report without the significant input we received from the public, industry, academia, and other government agencies."

A detailed description of each substance listed in the Report on Carcinogens is included in the new report.

Two known human carcinogens:

Aristolochic acids have been shown to cause high rates of bladder or upper urinary tract cancer among individuals with kidney or renal

disease who consumed botanical products containing aristolochic acids. Aristolochic acids are a family of acids that occur naturally in some plant species. Despite a warning issued in 2001 by the U.S. Food and Drug Administration that advised consumers to discontinue use of any botanical products containing aristolochic acids, they can still be purchased on the Internet and abroad, and may be found as a contaminant in herbal products used to treat a variety of symptoms and diseases, such as arthritis, gout, and inflammation.

Formaldehyde was first listed in the 2nd Report on Carcinogens as a substance that was reasonably anticipated to be a human carcinogen, after laboratory studies showed it caused nasal cancer in rats. There is now sufficient evidence from studies in humans to show that individuals with higher measures of exposure to formaldehyde are at increased risk for certain types of rare cancers, including nasopharyngeal (the nasopharnyx is the upper part of the throat behind the nose), sinonasal, as well as a specific cancer of the white blood cells known as myeloid leukemia. Formaldehyde is a colorless, flammable, strong-smelling chemical that is widely used to make resins for household items, such as composite wood products, paper product coatings, plastics, synthetic fibers, and textile finishes. Formaldehyde is also commonly used as a preservative in medical laboratories, mortuaries, and some consumer products, including some hair straightening products.

Six substances reasonably anticipated to be human carcinogens:

Captafol was found to induce cancer in experimental animal studies, which demonstrated that dietary exposure to captafol caused tumors at several different tissue sites in rats and mice. Captafol is a fungicide that had been used to control fungal diseases in fruits, vegetables, ornamental plants, and grasses, and as a seed treatment. It has been banned in the

United States since 1999, but past exposures may still have an effect on health.

Cobalt-tungsten carbide (in powder and hard metal form) showed limited evidence of lung cancer in workers involved in cobalt-tungsten carbide hard metal manufacturing. Cobalt-tungsten carbide is used to make cutting and grinding tools, dies, and wear-resistant products for a broad spectrum of industries, including oil and gas drilling, as well as mining. In the United States, cobalt-tungsten hard metals are commonly referred to as cemented or sintered carbides.

Certain inhalable glass wool fibers made the list based on experimental animal studies. Not all glass wool or man-made fibers were found to be carcinogenic. The specific glass wool fibers referred to in this report have been redefined from previous reports on carcinogens to include only those fibers that can enter the respiratory tract, are highly durable, and are biopersistent, meaning they remain in the lungs for long periods of time. Glass wool fibers generally fall into two categories for consumers: low-cost, general purpose fibers, and premium, special purpose fibers. The largest use of general purpose glass wool is for home and building insulation, which appears to be less durable and less biopersistent, and thus less likely to cause cancer in humans.

o-Nitrotoluene is listed because experimental animal studies showed tumor formation at many different tissue sites in rats and mice. o-Nitrotoluene is used as an intermediate in the preparation of azo dyes and other dyes, including magenta and various sulfur dyes for cotton, wool, silk, leather, and paper. It is also used in preparing agricultural chemicals, rubber chemicals, pesticides, petrochemicals, pharmaceuticals, and explosives. Workers in the United States are likely exposed to o-nitrotoluene through the skin or from breathing it during production and use. o-Nitrotoluene has also been detected in air and water near facilities that produce munitions, and near military training

facilities.

Riddelliine has been found to cause cancer of the blood vessels in rats and mice, leukemia and liver cancer in rats, and lung tumors in mice. This botanical should not be confused with the drug Ritalin, prescribed for the treatment of attention deficit hyperactivity disorder. Riddelliine is found in certain plants of the genus Senecio, a member of the daisy family, grown in sandy areas in the western United States and other parts of the world. Some common names for Senecio plants are ragwort and groundsel. Riddelliine-containing plants are not used for food in the United States, and have no known commercial uses. However, at least 13 Senecio species have been identified that are used in herbal medicines or possibly as food in other parts of the world. Exposure in humans could result from eating or drinking herbal medicine or teas, honey, or foods contaminated by parts of Senecio plants or after consuming products from animals that have fed on the plants.

Styrene is on the list based on human cancer studies, laboratory animal studies, and mechanistic scientific information. The limited evidence of cancer from studies in humans shows lymphohematopoietic cancer and genetic damage in the white blood cells, or lymphocytes, of workers exposed to styrene. Styrene is a synthetic chemical used worldwide in the manufacture of products such as rubber, plastic, insulation, fiberglass, pipes, automobile parts, food containers, and carpet backing. People may be exposed to styrene by breathing indoor air that has styrene vapors from building materials, tobacco smoke, and other products. The greatest exposure to styrene in the general population is through cigarette smoking. Workers in certain occupations may potentially be exposed to much higher levels of styrene than the general population.

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