



MILITARY VEHICLE AND AIRCRAFT EXHAUST EXPOSURE

A RESOURCE FOR VETERANS, SERVICE MEMBERS, AND THEIR FAMILIES

VETERANS WHO HAVE recently returned from deployment often have questions about being in close proximity to exhaust from military vehicles and aircraft. This fact sheet provides information on exposure to fuel exhaust and discusses the potential health effects.

BACKGROUND

Within the United States, the military uses diesel fuel extensively in ground equipment and in many tracked and wheeled vehicles. JP-8 is the fuel used commonly in fixed-wing and rotary-wing aircraft and as an alternative in vehicles that routinely use diesel. The navy uses JP-5 as the fuel for aircraft on carriers.

Outside of the US, JP-8 is used for most vehicles except cars and small trucks. Since most military engines (vehicular and others) can use either diesel or JP-8, JP-8 is used for tracked and wheeled vehicles, generators, furnaces, and sometimes even to start fires in burn barrels or open burning of trash.

WHAT IS IN DIESEL, JP-8, AND JP-5 EXHAUSTS?

When an engine is run, exhaust particles and gases become suspended in the air. Exhausts from the combustion or burning of diesel, JP-8 and JP-5 fuels are similar. Exhaust is a complex mixture of thousands of gases and fine particles (commonly known as soot). The carbon particle or soot content varies

from 60-80% depending on the fuel used and the type of engine.

All three types of exhaust contain chemicals such as nitrogen oxides, sulfur oxides, carbon dioxide, carbon monoxide, and fine particles called particulate matter (or "PM"). These chemicals occur naturally in the environment, but at high levels, may be harmful to the health of both the individual and the environment.

Exhaust from military vehicles and aircraft may also include known or suspected cancer-causing substances such as benzene, arsenic, and formaldehyde. The exhaust may also contain harmful pollutants that are frequent components of urban smog, such as nitrogen oxides.

WHAT ARE THE HEALTH EFFECTS OF DIESEL, JP-8, AND JP-5 EXHAUST?

Exposure to pollutants in diesel, JP-8 or JP-5 exhausts occurs whenever an individual breathes air that contains these particles and gases. The potential for and type of possible health effects from exposure to such exhaust depends on how much exhaust is inhaled. As with most airborne exposures, this is partly determined by how close someone is to the source (proximity) and how long someone is inhaling the exhaust (duration of exposure). Directly breathing in large quantities of exhaust fumes may cause nausea, dizziness, and irritation of the eyes, nose and throat.

These effects are generally short term and usually go away rapidly after the exposure ends. Very high and/or prolonged exposures to exhaust fumes may cause respiratory symptoms, such as coughing, chest tightness, breathlessness, and decrease in exercise tolerance, particularly in persons who are naturally predisposed or have a history of asthma or in persons with pre-existing lung problems. Exposures to exhaust fumes may aggravate respiratory symptoms in such persons.

LONG-TERM HEALTH EFFECTS

Diesel Exhaust and Lung Cancer

Researchers from the National Institutes of Health's (NIH's) National Cancer Institute (NCI) and the CDC's National Institute for Occupational Safety and Health (NIOSH) designed a study to closely examine the relationship between diesel exhaust and lung cancer. The Diesel Exhaust in Miners Study evaluated the health of over 12,000 workers at eight mining facilities.

The study provided evidence that high and repeated occupational exposures to diesel exhaust over a period of about 20 years or more may increase the risk of lung cancer and that the risk of death due to lung cancer rose with increasing diesel exhaust exposure.

Based on these findings, the International Agency for Research





on Cancer (IARC), part of the World Health Organization (WHO), classified diesel exhaust as carcinogenic (or cancer causing) to humans in June 2012.

WHAT CAN I DO IF I HAVE HEALTH CONCERNS RELATED TO EXPOSURE TO DIESEL, JP-5, AND/OR JP-8 EXHAUST?

If you are a Veteran and you believe you have symptoms related to diesel, JP-5, and/or JP-8 exhaust exposure you should schedule an appointment with your VA primary care provider to discuss your symptoms and concerns. You may also contact the Environmental Health Clinician at the VA facility located nearest to you or have your PCP place a WRIISC consult for you to have an exposure assessment by telephone or in-person with a physician who specializes in environmental medicine. Our team will talk to you about your concerns and answer any questions you might have.

WEB SITE RESOURCES:

Content for this fact sheet was adapted from the following sources:

- Health Effects Institute (HEI)
 - <http://www.osti.gov/bridge/purl.cover.jsp?sessionid=6FE31B05B6F04B4C6F134837A92137BA?pu rl=/827834-ld75mX/native/>
- Deployment Health and Family Readiness Library
 - <http://deploymenthealthlibrary.fhp.osd.mil/Product/RetrieveFile?prodId=307>
- American Cancer Society
 - <http://www.cancer.org/Cancer/CancerCauses/OtherCarcinogens/Pollution/diesel-exhaust>
- Environmental Protection Agency's Office of Environmental Health Hazard Assessment and The American Lung Association of California
 - http://www.oehha.org/public_info/facts/pdf/diesel4-02.pdf
- World Trade Center Health Program
 - <http://www.wtcexams.org>
- International Agency for Research on Cancer (IAC)
 - JNCI J Natl Cancer Inst (2012) doi:10.1093/jnci/djs034
 - ▶ <http://jnci.oxfordjournals.org/content/early/2012/03/05/jnci.djs034.abstract>
 - JNCI J Natl Cancer Inst (2012) doi: 10.1093/jnci/djs035
 - ▶ <http://jnci.oxfordjournals.org/content/early/2012/03/05/jnci.djs035.abstract>

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