

# Researcher looks through the noise to discover potential risks from jet fuel

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O'neil Guthrie in one of NAU's audiology labs. He came to NAU so he could teach, work as an audiologist and conduct cell research. Guthrie is interested in the process of gene repair and how cells can protect themselves from damage.

Jet noise can impair hearing but, when combined with exposure to fuel,

other serious effects may be occurring in the brains of military personnel.

O'neil Guthrie, a research scientist and clinical audiologist who joined NAU earlier this year, studied the risk of auditory problems among [test subjects](#) exposed to sustained noise and [jet fuel](#). When he was approached by Air Force officials who wanted to learn more about hearing loss among airmen, Guthrie also was interested in potential effects on the [brain](#).

"What we found is that at low levels, it is not toxic to the ears but toxic to the brain," said Guthrie, explaining that inhaling fuel is a more direct pathway to the brain. "Over time, these small exposures could accumulate and affect the brain's function."

Clinical conditions such as anxiety, depression, sleep disorders and post-traumatic stress could be attributed, in part, to hydrocarbon-related disruptions in [brain function](#), a factor previously overlooked during diagnoses.

Guthrie and his team conducted month-long experiments including exposure to jet fuel only, noise only and a combination. Different exposure levels also were tested. Additional experiments will build on the initial findings.

Hydrocarbons are found in fuels and many other commercial products including makeup and cleaning products. Guthrie said most people don't realize sustained exposure to these organic solvents, even at low levels, can be toxic to the brain.

The National Institutes of Health, the Department of Defense and the Veterans Administration funded Guthrie's [basic science research](#). He said his findings may have implications for establishing guidelines for

individuals working around fuel and noise, including those employed at airports and in the military.

Guthrie's other areas of research include improving the capacity of the body's cells to repair damaged genes and stimulating gut bacteria to supplement repair of DNA. Guthrie came to NAU to work as an audiologist, do research and teach.

Provided by Northern Arizona University

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