Comprehensive evaluation of patients with concussion-like symptoms following reports of audible phenomena in Cuba

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A comprehensive evaluation by clinical researchers at the Perelman School of Medicine at the University of Pennsylvania identified a neurological syndrome that left U.S. government personnel serving in Havana, Cuba with persistent memory and thinking dysfunction, as well as vision and balance problems after hearing unusual noises in their homes or hotel rooms. The team published their findings in *JAMA*.

"None of these patients have suffered any type of blunt head trauma, yet the symptoms they describe and evaluations demonstrate are remarkably similar to those found in persistent concussion syndrome," said the study's senior author, Douglas H. Smith, MD, the Robert A. Groff Professor and vice chair of Research and Education in the department of Neurosurgery and director of Penn's Center for Brain Injury and Repair. "It appears that we have identified a new syndrome that may have important public health implications."

In fall of 2016, U.S. government personnel serving in Havana began to report a variety of neurological symptoms often linked with hearing unusual noises in their homes and hotel rooms. Initial examinations were mainly performed at the University of Miami, revealing that the neurological signs resembled concussions. Penn's Center for Brain Injury and Repair was then selected to coordinate multidisciplinary evaluation, treatment, and rehabilitation of the patients, beginning in summer 2017. Participating Penn specialists included faculty from the departments of

physical medicine and rehabilitation, occupational medicine, neurology, neuropsychology, neurosurgery, and neuroradiology.

In the new study, the Penn research team reports that patients experienced a wide variety of neurocognitive symptoms, including memory problems, trouble concentrating and processing information, and word-finding difficulties. Visual focusing, dizziness, and balance problems were also commonly reported during and after the sound incidents, and many patients subsequently suffered from headaches and sleep problems.

To date, the team has identified more than 20 individuals with the history of exposure and/or symptoms. It is currently unclear if or how the noise is related to the reported symptoms.

"The good news is that the symptoms appear to respond to rehabilitation interventions in a similar fashion as we see in patients with persisting symptoms following a concussion," said the study's lead author, Randel Swanson, DO, PhD, an assistant professor of Physical Medicine and Rehabilitation. "While some patients reported that symptoms diminished on their own over time with no treatments, most individuals had symptoms that did not begin to improve until targeted therapies were initiated."

Armed with the results of each patient's evaluation, the Penn team has developed individualized, interdisciplinary neurorehabilitation programs to help patients recover and return safely to work.

The Penn Center for Brain Injury and Repair was founded more than 40 years ago, and is largest center of its kind. More than 30 principal investigators and their staff span diverse disciplines from across the University of Pennsylvania, including experts in neurosurgery, bioengineering, pharmacology, pathology, neurology, pediatrics,

neuroradiology, rehabilitation, occupational medicine, and emergency medicine. Working in a highly collaborative environment, these researchers study ways to significantly improve the quality of life for people suffering from traumatic brain injury (TBI) and to prevent the "secondary" or delayed injuries that are initiated by brain trauma.

Provided by Perelman School of Medicine at the University of Pennsylvania