

## Illnesses of Gulf war vets stump experts

An increasing, though still unknown, number of veterans of the Persian Gulf war experience debilitating fatigue, diarrhea, muscle and joint pain, memory loss, difficulty breathing, and extreme sensitivity to chemicals. Moreover, some report that their wives and children also have experienced these symptoms.

Physicians' attempts to diagnose or define this cluster of symptoms as a disease have failed. Now, a 12-member National Institutes of Health panel set up to try to develop a working definition of the disease has determined that it perhaps can't do so.

"There is no single disease or syndrome apparent, but rather multiple illnesses with overlapping symptoms and causes," the panel concluded in a 17-page draft report released at a press conference last week in Washington, D.C.

The members, most of them physicians or epidemiologists, wrote the report after reviewing material and listening to 1½ days of testimony from military officers, Gulf veterans, and researchers familiar with the veterans' stressful living conditions in the Gulf, as well as their symptoms.

Determining the nature of the diseases and the number of people ill from them will require more research, the panel

warned. In fact, panel member John D. Spengler of the Harvard School of Public Health in Boston says he was struck by the fact that basic information on what troops were exposed to during the Gulf war remains unavailable 3 years after the war ended.

The panel did narrow the list of possible causes of the illnesses, however. Some of the veterans appear to have a distinct form of post-traumatic stress disorder (PTSD) — one that includes more physical symptoms but less numbing and fewer flashbacks than non-Gulf PTSD cases, they write. The stress that Gulf personnel experienced may also influence "the way ordinary illnesses appear and perhaps induce other illnesses which we aren't used to seeing," says panel chair Gareth M. Green, also of the Harvard School of Public Health.

Examinations of up to 100 sick veterans revealed 31 cases of a "novel and unexpected manifestation of leishmaniasis," a parasitic infection that affects the intestines, says the report. Sand flies carry this difficult-to-diagnose disease, and its symptoms resemble those afflicting the Gulf troops.

Some veterans and researchers suggested that the illnesses may stem from living among a host of irritants, including



Smoke from the oil field fires in Kuwait made up part of the brew of pollutants that Gulf war veterans inhaled.

parasites, pesticides, sky-darkening smoke, sand as fine as dust, and petroleum fumes. Some believe chemical or biological warfare poisons made the veterans sick, although the Department of Defense claims it found no evidence of such agents.

The panel acknowledged that contaminants in the troops' Gulf environment could have contributed to their illnesses. However, it ruled as "unlikely" the possibility that illnesses resulted from exposure to the depleted uranium in munitions and armor, chemical or biological warfare agents, or vaccines the troops received to guard against possible nerve agents or diseases.

— T. Adler

### Cigarettes: Are they doubly addictive?

For years, nicotine has been widely acknowledged among health professionals as the agent responsible for fostering smokers' addiction to tobacco. But last week, a substance-abuse researcher described data indicating that cigarettes may actually provide an addictive double whammy. His former employer, a leading tobacco manufacturer, suppressed those findings for more than a decade.

The revelation emerged during a hearing of the House Subcommittee on Health and the Environment. By focusing on studies carried out at the Philip Morris Research Center's behavioral pharmacology lab more than a decade ago, the subcommittee hoped to learn what cigarette makers knew about their products' addictiveness — and when.

Victor J. DeNoble, who headed the Richmond, Va., lab during its 4-year existence, described rodent studies that his group conducted. One set demonstrated that acetaldehyde — a constituent of tobacco smoke — triggers the same "reinforcing" behavior in animals as nicotine. Such behavior serves as a hallmark of addictive substances.

For the experiments, DeNoble and his coworkers implanted a catheter into the atrium of a rat's heart. Then each rodent

was placed in a cage with a lever. Pressing the lever delivered a solution into the catheter — and thus the animal's heart.

When pressing the lever delivered only saltwater, the animals gave themselves about 8 doses a day. But when it delivered 8 micrograms of acetaldehyde per kilogram of body weight ( $\mu\text{g}/\text{kg}$ ) — the rat equivalent of what a person could receive from smoking one cigarette — the animals upped their daily intake to some 240 doses. When offered nicotine, the rats gave themselves 90 doses a day. However, when given the choice of a cigarette's worth of nicotine and acetaldehyde, the animals self-administered 400 doses a day.

"We were permitted to give talks [outside the company] on nicotine but never on acetaldehyde," DeNoble testified.

By late 1983, he learned that even the lab's reports on nicotine's potential addictiveness proved a threat because of litigation facing Philip Morris. In April — without warning — supervisors gave DeNoble a day to shut down his program. Told that the company had no work for researchers of their stature, DeNoble's team were encouraged to find work elsewhere, which they did.

But confidentiality agreements that the researchers signed forbade them

from ever discussing their studies at the Richmond lab. The subcommittee got a waiver from Philip Morris so that DeNoble and a coworker could testify.

DeNoble's acetaldehyde data are new but not shocking, says Zalman Amit of Concordia University in Montreal. "Any substance that delivers low levels of acetaldehyde — below about 30 or 40  $\mu\text{g}/\text{kg}$  of body weight — should be reinforcing," his data indicate. Indeed, as the first product formed during the body's breakdown of alcohol, acetaldehyde may be responsible for the addictive properties leading to alcoholism, he says.

DeNoble's report even raises the possibility that acetaldehyde may explain the often observed link between smoking and drinking, adds Herbert D. Kleber of the Center on Addiction and Substance Abuse at Columbia University. "People who try to give up smoking find it hardest when they're drinking," he notes.

Following up on DeNoble's findings could also lead to a better understanding of nicotine's role in cigarettes, notes Jack E. Henningfield of the National Institute on Drug Abuse's Addiction Research Center in Baltimore. Certainly, he says, DeNoble's data "raise the possibility [that] acetaldehyde may be magnifying the effect of nicotine." — J. Raloff