

## Asthma drug may do more harm than good

A bronchodilator drug used to open airways may actually exacerbate asthma when used routinely, according to a year-long study of asthma patients in New Zealand. If related drugs cause similar effects, the finding may help explain a widespread increase in asthma deaths over the past few decades, the researchers say.

Asthma's death toll has risen alarmingly in the United States, England, Germany, Ireland, Belgium and particularly New Zealand, where researchers have reported "epidemics" of asthma deaths. Respiratory specialists don't know what's causing the trend, but several have speculated that some aspect of asthma treatment might play a contributing role.

Malcolm R. Sears of McMaster University in Hamilton, Ontario, and his co-workers at the University of Otago Medical School in Dunedin, New Zealand, now report evidence linking the bronchodilator drug fenoterol with worsening symptoms in some asthmatics.

Fenoterol belongs to a class of drugs called beta-agonists, which ease breathing by relaxing constricted muscles surrounding the narrowed airways. Fenoterol is not available in the United States, but many U.S. asthma patients inhale similar beta-agonist drugs, such as salbutamol or terbutaline, notes asthma researcher A. Sonia Buist of the Oregon Health Sciences University in Portland. Buist says the new study raises concerns that fenoterol and other beta-agonists may, over the long run, do asthma patients more harm than good.

Sears' team studied 64 New Zealanders with moderate asthma. Half the volunteers inhaled a dry-powder form of fenoterol four times daily, while the rest inhaled a placebo powder. After six months, the two groups traded treatments. Throughout the study, volunteers were permitted to use their regularly prescribed beta-agonist inhalers as needed to control breathing difficulties. Each made twice-daily entries in a log, describing all medication taken and any symptoms of wheezing, coughing, respiratory secretions or tightness of chest.

"We broke the code [of the double-blind study] in July and were astonished at the results," Sears says.

Statistical analysis of data from the logs revealed that 57 of the 64 volunteers experienced clear improvements or declines in asthma control after switching from one test treatment to the other, the researchers report in the Dec. 8 LANCET. Seventeen of those individuals (30 percent) reported more asthma symptoms during placebo treatment than during fenoterol treatment. But the remainder — 70 percent — fared better on the placebo than on fenoterol. These 40 volunteers reported more symptoms — and in some

cases more puffs on their as-needed inhalers — during the fenoterol phase.

Sears speculates that reliance on fenoterol may contribute to an insidious decline in some asthmatics, perhaps by triggering a cycle in which airway muscles relax right after drug inhalation but constrict again when treatment wears off. To keep airways open, many asthmatics routinely inhale beta-agonists several times a day. But while these drugs do offer short-term relief, they do not treat the underlying airway inflammation. Sears suggests that the cumulative effects of their routine use may increase local inflammation and lead to permanent scarring that further narrows the air-

ways, perhaps heightening the risk of death from a future attack.

Whether beta-agonist inhalers commonly used in the United States cause such adverse effects remains unknown, notes Albert L. Sheffer, an asthma expert at Harvard Medical School in Boston. Sears says he believes fenoterol is not alone, but he agrees that further research must confirm that suspicion. "I'm certainly not saying these drugs should be banned," Sears says. However, both he and Sheffer advise physicians to steer asthma patients away from heavy use of beta-agonist inhalers, and instead recommend occasional use of bronchodilators combined with a regimen of inhaled steroids, which fight inflammation and thus offer the prospect of getting asthma under long-term control. — K.A. Fackelmann

## Risky business: Tackling computer security

NASA created the Space Physics Analysis Network a decade ago to enable scientists conducting NASA-related research to share data and ideas. But scientists were not the only users of this computer network. From 1981 into 1989, unauthorized users successfully penetrated network security dozens of times, roaming freely throughout the system. Although NASA officials say these intruders apparently didn't destroy or alter any data, future intrusions might prove considerably less benign.

The list of security breaches affecting computer systems worldwide grows week by week: virus attacks, lottery fraud, information theft, computer break-ins, espionage. Such incidents demonstrate the weakness of the invisible fences protecting most computer systems and networks from intruders, whether joy-riding high-school hackers, disgruntled employees or international spies.

In response to concerns about the safety, reliability and security of U.S. computer systems, a National Research Council panel last week issued a report detailing the extreme vulnerability of present-day systems.

"The committee believes that our computer systems and information are at risk, and that this in turn places society at risk," says computer scientist David D. Clark of the Massachusetts Institute of Technology, who chaired the panel. "Our central conclusion is that national computing and communications systems are vulnerable to potentially catastrophic security breaches and accidental failures."

The report — one of the most comprehensive looks at security problems in nonmilitary, unclassified computer systems and networks — paints an alarming picture of the parlous state of those systems. "The modern thief can steal more with a computer than with a gun," the authors state. "Tomorrow's terrorist may be able to do more damage with a

keyboard than with a bomb."

Despite such threats, many companies and institutions fail to take computer security seriously, the panel contends. Computer companies that offer systems with enhanced security find few customers, and users persist in ignoring basic precautions. Many users, for example, still use easy-to-guess passwords, such as their own names.

"One of the saddest facts is that people don't think about protecting themselves until after they've been burned," says panel member Peter G. Neumann of SRI International in Menlo Park, Calif.

To help establish a more reliable and secure computer capability by the end of the decade, the committee recommends the formulation of criteria that establish whether a given system has adequate security. "Raising everyone to a minimum level of security is important because it often takes only one weak link in a computer network to permit access to the entire system," Clark says.

Recognizing that no existing institution is equipped for such a task, the committee calls for the creation of a private, not-for-profit, federally sanctioned organization to tackle the problem. Funded by fees and membership dues, the proposed "Information Security Foundation" would develop security guidelines, support research on computer security, perform system evaluations, track computer breaches and potential threats, and foster the training of computer security experts.

"Computer systems have become too important to our personal and national well-being [for us] to continue to rely on blind faith," Clark says. So far, the United States has escaped any successful systematic attempts to subvert critical computer systems, he adds. "Unfortunately, there is reason to believe that our luck may soon run out unless we take action now."

— I. Peterson