

Bold Aim in Stroke: Spare the Brain

Doctors of stroke patients were once so hampered by the lack of a remedy that they served mainly as "guides on a tragic journey," as one physician put it. Now, a newly available drug promises to change that—and health authorities have proposed a national strategy to speed patients into treatment in an effort to limit brain damage.

"The goal is to change the paradigm for the treatment of stroke in this country," Zach W. Hall, director of the National Institute of Neurological Disorders and Stroke (NINDS) in Bethesda, Md., told members of 50 medical groups meeting in Arlington, Va., last week to draft the plan.

The drug is tissue plasminogen activator, tPA, which dissolves blood clots. Developed by Genentech of South San Francisco, Calif., the intravenous drug

has been used for 9 years to treat people having heart attacks. In June, the Food and Drug Administration approved a low-dose version for people suffering from strokes caused by clots that obstruct blood flow to the brain.

Trade-named Activase, tPA is effective only against these so-called ischemic strokes; it cannot help someone with a stroke caused by a hemorrhage. Since 80 percent of the 500,000 strokes that occur each year in the United States are ischemic, however, tPA could save thousands of people from paralysis and dependence on others.

A blood clot that causes ischemic stroke forms elsewhere in the body before breaking loose and traveling to the proximal cerebral artery. There, it cuts off blood flowing to the nerve centers that control speech and movement,

causing weakness or numbness of the face or limbs, impaired vision, slurred speech, and unsteadiness.

Doctors must begin treating stroke victims within 3 hours in order to restore blood flow. The new strategy begins with a publicity campaign to ensure that anyone who experiences or witnesses a stroke knows what symptoms to look for. Other key elements include quick transportation to the hospital, rapid diagnosis using a CT scan of the brain, treatment with tPA, and rehabilitation.

"Brain cells are dying each minute after a stroke occurs—time equals brain," said John R. Marler, the NINDS medical officer who voiced jubilation that doctors would no longer have to serve merely as guides for patients descending into debility. Marler supervised a multicenter trial showing that 12 percent of patients given tPA quickly reverted to normal. Six percent of the patients who got tPA suffered hemorrhaging, however, and had to forgo the treatment.

Just 4,000 stroke patients have been treated with the drug since it was approved, said Paul Laland, a Genentech spokesman. Doctors would like to extend treatment to 40,000 people by the end of next year.

The drug costs \$2,200 per treatment, but this figure is a fraction of the \$30,000 annual cost of sustaining one stroke patient in a nursing home.

Most hospitals have stocks of tPA on hand to treat heart attack patients, who get a higher dose. The new strategy, to be released in a month through the groups that attended the meeting, would also recommend that all hospitals have a CT scanner available and a stroke "code team" of trained doctors, nurses, and technicians on call around the clock.

The new procedures don't guarantee that treatment will reach most patients. Just 10 to 15 percent of hospitals now have stroke protocols. Although tPA has been available for nearly a decade, fewer than 35 percent of heart attack patients receive it.

James C. Grotta of the University of Texas Medical School in Houston objected that the new stroke guidelines fail to designate qualified hospitals as stroke centers. Consequently, paramedics won't know where to take patients, he said, and patients who expect tPA may not get it and "will be upset."

William G. Barsan of the University of Michigan Medical Center in Ann Arbor said the guidelines "rely on primary physicians to send the patient to the right place." —S. Sternberg

Master pianists mature well with practice

Not surprisingly, the late classical pianist Vladimir Horowitz began to move and react more slowly as he got older. Yet even in his eighties, Horowitz's magnificent performances attracted standing-room-only audiences.

Horowitz stood as a stellar example of an age-defying phenomenon typical of older professional pianists, according to a new study. Intensive practice throughout adulthood maintains the musical skills of these elderly performers at levels comparable to those of much younger piano masters, despite decreases in general mental and motor abilities that accompany aging, contend Ralf Th. Krampe of the University of Potsdam, Germany, and K. Anders Ericsson of Florida State University in Tallahassee.

"Our research shows that a sufficient amount of daily, deliberate practice can suspend any observable age-related declines in expert musical performance, at least until around 65 years of age," Ericsson holds.

The psychologists recruited 24 young pianists between the ages of 20 and 31, half of them "experts" who were taking advanced solo classes and half of them amateurs with several years of instruction. The study also included 24 pianists age 52 to 68, divided evenly between professional performers and amateurs.

On tests of finger-tapping speed and general reaction time, both groups of older pianists showed characteristic age-related declines compared to their younger counterparts. But on musical measures, such as the ability to vary the

tempo and loudness of phrases while playing a moderately complex composition, age-related losses appeared only in the amateurs; older and younger experts did about equally well.

The older expert pianists reported having practiced the instrument intensively from childhood through their early twenties, with only a slight drop-off in practicing since then, the researchers report in the December *JOURNAL OF EXPERIMENTAL PSYCHOLOGY: GENERAL*. Professional musicians must constantly perform in public and face evaluation by their peers, a strong spur to practice. The older amateur pianists began playing at a later age and practiced much less during adulthood than the older expert pianists, Krampe and Ericsson add.

Thanks to their Herculean practice schedules, expert pianists acquire mental capacities that enable them to work around the cognitive and motor limitations that arise later in life, the scientists assert.

Further research must address how motivated adults can improve and preserve various types of expert skills, Ericsson says.

"Krampe and Ericsson's finding is provocative and somewhat unusual in the scientific literature," remarks psychologist Timothy A. Salthouse of the Georgia Institute of Technology in Atlanta. "I'd like to see it replicated." Salthouse still suspects that age-related losses of general cognitive abilities interfere to some extent with the performance of older professional musicians and other experts. —B. Bower