Volunteering Overseas Gives Physicians a Measure of Adventure and Altruism

Mike Mitka

IF TREATING PATIENTS ATOP THE ROOF of the world in the Himalayan mountains, a hospital in war-torn Afghanistan, or a refugee camp in Sudan's Darfur region sounds intriguing, physicians can do more than dream about such scenarios—they can volunteer with organizations that will allow them to mix altruism with adventure.

But physicians willing to donate their skills and some time do not always have to do so in risky places—people in less hostile and yet still exotic locales are also in need of medical care.

Today, many organizations offer volunteer opportunities for US physicians overseas. Traditionally, *JAMA* has published a triennial listing of such organizations with contact information, areas served, and specialties needed. This year the listing moves to the *JAMA* CareerNet Web site in an effort to improve access and allow for more frequent updating of the information. The online directory at http://jamacareernet.ama-assn.org/misc/volunteer.dtl will also allow physicians to link directly with the Web sites of organizations offering volunteer experiences.

UP, UP, AND AWAY

The variety of missions available to volunteer physicians is quite broad. For example, on the high-adventure side, a physician might consider the Himalayan Rescue Association (HRA) in Nepal.

Founded in 1973, this nonprofit organization (http://www.himalayanrescue.org) was begun by an American Peace Corps member who had heard that trekkers and climbers were dying of altitude illness. Today, the HRA operates two aid posts, usually staffed by two physician volunteers each, during the spring and fall trekking and climbing seasons in Pheriche and Manang on the way from Kathmandu to Mount Everest. The HRA also runs a post during the spring climbing season at the Mount Everest base camp 17 500 feet above sea level.

The HRA generally uses volunteer internists and emergency and family physicians for the Pheriche and Manang posts. These volunteers, who should be able to treat altitude sickness as well as respiratory and gastrointestinal tract illnesses, spend about two thirds of their professional time treating area residents and one third of their time treating trekkers and climbers. Physicians serving the Mount Everest base camp must have had a previous tour with HRA in Pheriche or Manang.

Working for the HRA requires a significant time commitment—3 months. Much of the first month is spent just getting to the aid posts because volunteers must slowly adapt to the ever-increasing elevation changes to avoid altitude sickness. Volunteer physicians must also realize that they will be spending their weeks in wilderness conditions in a setting that is always cold. But conditions are not always completely Spartan, said Ken Zafren, MD, the HRA's associate medical director (North America).

"You get a roof over your head and the Sherpas do your cooking; we sometimes even have running water and a flush toilet that works," said Zafren cheerfully from Anchorage, where he's an emergency physician with the Alaska Native Medical Center.

While conditions are primitive, volunteers do get time to hike and absorb a unique culture. They also get to practice medicine at its essence. "You always hear the volunteers saying how great the experience was because they got to use the skills learned in medical school—history and physical," Zafren said.

CITIZENS OF THE WORD

Adventure-seeking physicians also have opportunities to make a difference to people whose lives are threatened by natural disasters or conflict. For example, the International Medical Corps (IMC) has conducted volunteer missions since 1984 at places in need of serious humanitarian aid.

For natural disasters such as last year's tsunami in southern Asia, the IMC (http://www.imcworldwide.org) deploys special teams of physician volunteers who are prepared to leave their practices at a moment's notice. But the IMC also offers less hectic missions, generally

Ken Zafren, MD/Himalayan Rescue Association

Physician volunteer opportunities abound around the world—even in Nepal, at the Mount Everest Base Camp clinic run by the Himalayan Rescue Association.

targeted toward training local clinicians to administer treatment long after the volunteers leave, explained Stephen Tomlin, IMC's vice president of program policy and planning.

"We like to see our volunteers commit to at least 3 weeks of service because where they go—places with low technology and different cultures—it takes time to overcome these challenges," said Tomlin from the IMC offices in Santa Monica, Calif.

Bill Moore, MD, an orthopedic surgeon in Santa Fe, NM, who has been on several IMC missions to Afghanistan, said the best volunteers for much of IMC's efforts are physicians with public health backgrounds.

"While I look great doing surgeries in Afghanistan, the best people to volunteer are physicians with a public health background," Moore explained. "Surgeons can't do as much as a public health physician who can, for example, eradicate malaria in a region."

Moore calls his IMC work "a lot of fun," noting that it beats dealing with insurance companies. He also advises physicians who are considering volunteer work to check their egos at their offices when working in foreign lands.

"You don't want someone who wants to be a hero," Moore said. "If you think you'll save the world, forget about it. But you can change a small part." □

Study Reveals Mitochondrial Role in Aging

Tracy Hampton, PhD

EXPERIMENTS THAT CAUSED MICE TO quickly develop characteristics of premature aging reveal that mutations in mitochondrial DNA may play a key role in growing old.

For years, mitochondria have been linked to aging. In the new findings, researchers demonstrated that an accumulation of genetic mutations in mitochondria sets off a cascade of signals that causes programmed cell death, or apoptosis (Kujoth et al. *Science*. 2005;309:481-484). The result is loss of irreplaceable cells and progression of aging.

All mitochondria have their own DNA, separate from DNA in the cell's nucleus. Researchers have known that mutations in mitochondrial DNA accumulate over time, but how these mutations might underlie aging has not been clear. To shed light on the issue, the study's investigators analyzed mice genetically altered to have a deficiency in a protein that "proofreads" the genetic sequence of mitochondrial DNA; these mice accumulate genetic mutations at a higher rate than normal mice. "It's like a broken spell-checker," said principal investigator Tomas Prolla, PhD, of the University of Wisconsin, in Madison. "By introducing a malfunction in the proofreading domain, these mutations accumulate much more rapidly," he explained.

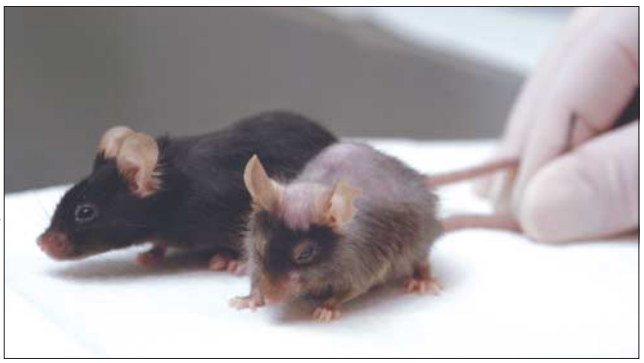
Due to this genetic alteration, the cells of these mice had accelerated rates of apoptosis that resulted in the loss of certain critical adult stem cells that are essential for replacing cells that die, said Prolla. This scenario led to premature hair loss, graying, and atrophied muscle and bone.

Interestingly, oxidative stress, a proposed culprit in mitochondria's mechanism of aging, did not seem to factor into the premature aging of these animals. Some researchers have suspected that oxidative stress—cellular damage caused when mitochondria produce oxygen-derived molecules known as free radicals—is responsible for the aging process. But in this latest report, oxidative stress in some tissues actually decreased when mutations increased.

A role for DNA damage in the aging process is supported by previous findings that humans and mice with defects in DNA repair genes experience premature aging. For example, mutations in the gene *WRN* cause Werner syndrome, an autosomal recessive disease characterized by premature aging, large numbers of genomic alterations, and increased cancer incidence (Chang et al. *Nat Genet*. 2004;36:877-882).

In addition, the investigators concluded that their hypothesis that apoptosis is an important mechanism of aging is supported by studies of caloric restriction, an intervention that has been shown in some animals to retard aging, delay the accumulation of mitochondrial DNA mutations, and reduce mitochondria-mediated apoptosis.

Prolla sees clinical potential for his line of study down the road. If scientists can successfully improve mitochondrial function and reduce apoptosis in animal models, "then we can begin to think about pharmaceutical interventions to retard aging by preserving mitochondrial function," he said. □



Jeff Miller/University of Wisconsin-Madison

A normal mouse (left) and a mouse with mitochondrial DNA defects (right) are similar in age, but the mouse at right exhibits symptoms of aging, including graying, hair loss, and loss of muscle mass and spine strength.