Physical activity is good for the brain, too

By Cynthia H. Craft, Sacramento Bee

If you leapt out of bed Jan. 1 bubbling with resolve to greet the new year with a rigorous fitness routine, get ready for a bonus.

Research has long established what exercise can do for heart and muscle development. Now, according to an expanding body of research, it could also be growing your brain.

The results of several new studies indicate that physical activity may make you better at learning and memory tasks. And in a hopeful sign for America's aging population, it is thought to be a factor in warding off dementia.

"What we now know pretty well is that animals who exercise have greater levels of chemicals in the brain that promote brain growth," said Owen Carmichael, associate professor in the neurology department at UC Davis Medical Center. "These neuro-growth factors are what tell the brain to grow new cells."

In particular, Carmichael points to research on rats showing that of two groups – one kept from exercising and the other exercised vigorously – the "active rats were gunning to go," mentally. The inactive rats showed an "inhibited ability to form new neurons; they didn't remember as well" as the active rats.

Fast-forward from rodent research to anthropology and you come across a set of human evolution studies that suggest the human brain grew because of robust physical activity.

David A. Raichlen, an anthropologist at the University of

Arizona, is the primary author of at least two new papers exploring the thesis. Collaborating with colleagues in 2011, Raichlen published online his examination called "Relationships Between Exercise Capacity and Brain Size in Mammals."

This and other research say that aerobic exercise stimulates myriad brain-growth factors, including blood and an insulin-like substance "which appear to lead to exercise-induced neurogenesis in the rodent and human hippocampus."

This may be how human brains developed, proportionately, to three times the size of those in other mammals, experts say.

"Being sedentary was not really an option in the days when you had to chase your dinner," Carmichael said.

In addition, a 2011 paper in the EPMA Journal, a European science publication, offers hope to those recovering from brain injuries or concerned about dementia. Citing animal studies, the paper's authors said exercise may help in the creation of growth cells that surround injured brain tissue, and in the hippocampus.

The brain's hippocampus is ground zero for memory tasks, and atrophy as a result of advanced aging is a risk factor in Alzheimer's.

But according to the paper, "data indicate that exercise may alleviate disease progression in Alzheimer's disease, as well as in other neurodegenerative conditions like Parkinson's disease."

The European paper recommends further human study using tools such as magnetic resonance imaging and PET scans to measure brain size after activity.

Ted Smith is co-owner with his wife, Chaz Smith, of the Hangtown Fencing Club in Placerville, and has been fencing for

22 years. At 60, he has twice been the U.S. national champion in the 40-and-up divisions and regularly places in the nation’s top four fencers in his age group.

Smith doesn’t need studies to reinforce what he has observed among colleagues in the highly competitive international fencing field.

“People I know who compete in my age division are very athletic,” Smith said. “A lot of these guys are amazingly energized at 60 and older. They are constantly mentally adjusting to the changes their opponents make every second. They are adjusting their own strategies instantly.”

Besides providing challenging brain work, physical activity also trains the brain so that “your balance improves and your flexibility improves,” said Smith, who coaches about 20 young fencers. “Your chances of slipping and falling are far less.”

In a recent Public Broadcasting Service discussion of a book he co-authored called “Super Brain,” Harvard professor of neurology Rudy Tanzi captivates television audience members with tales of the human brain’s prowess.

Then, without explanation, he asks the studio audience to rise and run in place for several seconds. They do so, looking bemused and befuddled. When Tanzi stops them, he explains the purpose of the drill: They’ve just fed their brains.

Researchers say even the smallest amount of aerobic activity helps. But benefits to the brain are greater if you run rather than jog, jog rather than walk, walk briskly rather than stroll. This is because the more rigorous the activity, the greater the blood supply and insulin-like flow to the brain.

Evette Tsang, 43, of Sacramento is a four-year breast cancer survivor who embraces exercise as a means of living healthy. Tsang was not aware of the latest research but already was leading an effort of several wellness groups to make joint New

Year’s resolutions in 2013 to step up aerobic physical activity.

“Definitely, when I exercise, it clears the mind and makes me feel better,” Tsang said.

Or, in the lexicon of science, as expressed in a Trends in Neuroscience abstract in 2007: “Human and other animal studies demonstrate that exercise targets many aspects of brain function and has broad effects on overall brain health.”