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## Blazing a path to very old age

**By studying seniors age 90 and older in Orange County, researchers hope to find clues to robust longevity.**

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Most of the people Dr. Claudia Kawas refers to as "trailblazers" enter her Laguna Woods medical clinic haltingly, often with walkers or canes, or clutching the hand of someone with a steadier gait. Some don't come into the clinic at all; they're at home, bedridden.

But the trailblazer description is fitting. It refers to a group of Americans who have far exceeded average life expectancy and are now showing others not only what it's like to reach very old age — but also, maybe, how to get there.

Kawas, a professor of neurology, neurobiology and behavior at UC Irvine, is the architect of a \$9-million federally funded study monitoring the health and well-being of people 90 and older in Laguna Woods. Her work is part of a growing body of research into the phenomenon she calls extreme aging.

"In order to understand aging, you need to understand how to age well," Kawas says. "These people are the fastest-growing segment of the population, but we don't know much about them. We don't know how many are demented or how many of them are walking around well."

A description of extreme aging is starting to jell, however, thanks to Kawas' data and that of a few other longevity studies. And the information is timely. Just under 2 million Americans are 90 and older, but that number is expected to grow to 10 million by 2050.

Understanding the health needs and quality of life among the very old is essential, Kawas says. But relatively little is known about the status of this group. For example, when she first began the project, Kawas was able to locate only a couple of studies on dementia rates in people older than 90 — a key area of concern for researchers.

More research has been done since then. But, she says, "We still don't know if the dementia rate increases, decreases or stays the same after 90. If half of all these people have dementia, that will be 5 million people with dementia in 2050. That's double what we have now. We have a public health issue looming here."

Making sense of the numbers is only possible by examining one 90-plus-year-old at a time — something Kawas' staff does patiently. Their subjects are residents of the enormous Leisure World retirement community in Laguna Woods. The study, called the Leisure World Cohort Study, actually began in 1981 when USC researchers started collecting health and lifestyle data, via mailed questionnaires, from about 14,000 Leisure

World residents.

Two years ago, researchers identified 1,160 people in the group who were then 90 or older. About 800 of these people agreed to enter a more rigorous study, called the 90-Plus study, in which they would undergo a multitude of medical, psychological and functional tests every six months.

Kawas and her staff were touched and surprised by the number of people who agreed to join them in their quest.

"I think they want to make a contribution," says Kawas, whose gentle and cheerful approach to her subjects creates a kind of family atmosphere in the clinic. "They recognize this won't help them in any direct way. It's altruistic. But there is a note of pride. They want to show off."

Although many participants are too frail to come into the clinic and instead undergo limited testing at home, others seem to enjoy the experience.

On a recent afternoon, Renee Rauch, 92, is attending her exam dressed in a fashionable gray sweater ensemble with a matching beret and sunglasses. During a memory test, she jokes and verbally spars with research assistant Carole McIntyre.

"Mrs. Rauch, what is today's date?" McIntyre asks.

"Nov. 2," Rauch says.

"What city are we in?"

"Laguna Woods," she responds.

"What state are we in?"

"A state of confusion," Rauch answers without missing a beat. She laughs at her joke.

"Now, Mrs. Rauch, I meant the geographical state," McIntyre says.

"Oh, OK. California."

The testing can be rigorous for people many years past retirement. Subjects are asked to recall names, dates and lists; copy geometric figures; perform mathematical problems; and submit handwriting samples. They have their hearing, language, vision and movement tested, give blood and undergo physical exams. They share information about their health problems and their medications.

Many become tired during the testing, Kawas says. And some subjects fret that they won't be able to complete the work or won't do well. Beverly Ducey, the clinic's recruiter, calls patients to remind them of their appointments. She often has to do some cajoling.

"They may say, 'I'm too old. I don't want to do this,' " Ducey says. "I tell them they're not too old; they're important to the study."

Vivian Jones, 93, agrees that the testing can sometimes feel like a personal challenge.

"I do it because I like to see how my brain is working," Jones says. "But I worry about being a failure."

Kawas and her staff, of course, know that there is no such thing as a passing or failing grade in the 90-Plus Study. Good results or bad, the test results provide rich information for them to chew on.

For example, a review of lifestyle data showed that diet and intake of antioxidant vitamins appears to have had little effect on longevity. But moderate wine drinking (about one to two glasses a day) was linked to longevity, as was daily consumption of caffeinated coffee. Being even borderline overweight or too skinny decreased the odds of surviving to age 90, while a moderate body mass index in later adulthood increased the odds. Being physically active well into adulthood also increased survival to 90.

Some findings are perplexing. Although a major national study of women showed that taking hormone replacement therapy can increase the risk of heart attack or stroke, Kawas' data found that women who used estrogen had a lower risk of dying before 90.

Quality-of-life and depression measurements tend to show people who are quite happy, Kawas notes. And in data presented to the American Geriatric Society last spring, Kawas' group found that most of the extreme-agers could accomplish many daily living tasks independently, such as bathing, eating, dressing, shopping, bill paying, cooking and using the telephone.

But old age isn't a picnic for everyone. The study found that after 90 there is a decline in all areas of cognitive functioning. "They become much slower in their cognitive functions," Kawas says. Falling was a problem for about 40% of the group — an area in which medicine needs to provide much more preventive help to the elderly, she says.

Besides identifying lifestyle factors that may contribute to longevity, the study is also trying to determine if very old people are simply fulfilling their genetic destiny. Previous research has shown that longevity runs in families. About 500 of the participants have contributed their DNA to the study in a search for so-called longevity genes.

"There is no question in my mind that longevity is a combination of genetics and environment," Kawas says. "That's really what our study is all about, to collect genetic information and collect lifestyle information and see which of these is important."

A final piece of the study is a look — after death — at the brains of the very old. About 100 participants have agreed to donate their brains for autopsy so that researchers can examine them. Cognitive studies have shown that roughly one-third of the participants have dementia (such as Alzheimer's disease), one-third have some memory trouble and one-third are fine.

But scientists have been perplexed at the 25 brains autopsied so far. The brains of people with dementia often look normal. "These brains are not what you would expect to see in very old age," Kawas says.

Studies such as the one being done in Laguna Woods contribute both genetic and lifestyle information, says Dr. Robert Butler, president of the International Longevity Center in New York City.

"One thing we're beginning to understand through these various longevity studies is that such individuals seem to age more slowly," he says. "For example, women who become centenarians have shown the capacity for having babies later in life."

Genetic studies so far suggest that an area on the fourth chromosome may contain clues about longevity.

"This tells us there may be certain characteristics about those who are able to live exceptionally long that might be useful for people of all ages," says Butler, a professor of geriatrics at Mount Sinai School of Medicine in New York City.

But besides gathering reams of data, working so close to "extreme agers" is something of an inspiration, the UCI team says. Some of the things they learn from their participants are unexpected and don't quite fit into their charts and graphs and computer analyses.

For example, when asked why she thinks some people live to a very old age, Vivian Jones says it's all about mind-set. She believes those who find a reason to live, such as helping others, live longer.

"It's about giving of yourself and what you have — sharing," she says.

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### Group portraits of the aged

In studies across the country, scientists are tracking people as they age in an effort to paint an accurate portrait of aging. The resulting information is especially useful when pooled, says Dr. Robert Butler, a longevity expert at Mount Sinai School of Medicine. Besides the Leisure World Cohort Study, other large, ongoing longevity studies in the United States include:

**The Baltimore Longitudinal Study of Aging:** This is the longest-running study of human aging in the United States, begun in 1958 with just a small group of male participants. The study is now following more than 1,400 men and women, ranging in age from 20 to 90 and older. So far, the study has found that older people cope more effectively with stress than young adults and that personality seems to stabilize after age 30.

**The New England Centenarian Study:** This research project, begun in 1994, currently involves 1,500 people, including centenarians, their children and siblings. The study has so far determined that Alzheimer's disease is not inevitable and that at least 50% of centenarians have first-degree relatives who also achieve very old age.

**Exceptional Longevity Family Study:** This is a new study funded by the National Institute on Aging that will collect health and genetic information from more than 3,000 long-lived volunteers in the United States and Europe and their descendants. The study will look for genetic links to the major diseases as well as examine the influence of personal health habits.

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