If Obama grows old before his time, stressed-out cell tips might be to blame

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The Washington Post
Tuesday, January 20, 2009

Focused though the world is on the youthful athleticism of the 47 year old who took the oath of office today, it’s tempting to ask what impact his new job will have on President Barack Obama over his four — or eight — years in office.

The battle lines of two or more wars may by then have furrowed his brow; a sagging economy put bags under his eyes; and as-yet-untold worries stolen the spring from his jump shot. That’s unless another trait, the calm with which Obama apparently responds to stress, allows him to transcend the unique demands of leading the free world.

If looks are anything to go by — and science suggests they may be — the cares of the world weigh heavily on our leaders. Witness the graying of Bill Clinton and the wizening of George W. Bush.

Presidents undergo a process of accelerated aging, according to Michael Roizen, who has accumulated facts and figures on presidential health dating back to the 1920s and speculates that “presidents get two years older for every year they’re in office.” If Roizen’s right, eight years from now Obama may look more 63 than 55.

There’s no single theory of aging, or senescence, to explain why some people age more quickly than others. Most agree, though, that our bodies reach their peak in our mid-20s, and it’s almost all downhill from there — and slow going, given that life expectancy in the United States now extends about a decade beyond the proverbial three score years and 10.

No surprise then, that in our obsession with beating that clock, some are trying to ignore the inexorable truth of chronological age (the number of candles you blow out every year) in favor of the more malleable notion of biological age (how our bodies are actually doing).

A leader in that field is Roizen, chair of the Wellness Institute at the Cleveland Clinic and co-founder of RealAge.com. He has devised an algorithm to calculate a person’s age that combines the candle count and
genetic factors revealed by family history with such influences as cholesterol level, weight and loyal friendships, as well as bad habits (such as smoking) and good ones (such as playing basketball).

One reason why people in top jobs like presidents and CEOs age so quickly, Roizen believes, is that it is indeed lonely up there. And although he doesn’t have the data to figure out Obama’s “real age,” last year Roizen allocated an age of just under 64 to the president-elect’s final rival, John McCain, then 71. The hoary senator’s vigorous performance on a cardiovascular stress test took years off his total.

Cell biologists have a method of assessing age that begins under the microscope, and that first came to many people’s attention in the late 1990s after the birth of Dolly, the cloned sheep. Dolly looked like a lamb and baaed like a lamb, but her cells bore signs of a more mature ewe: stunted telomeres.

Telomeres are segments of DNA that scientists have come to regard as a kind of biological clock. As organisms age, their cells divide, and these protective caps on the end of chromosomes shorten, eventually eroding until the cell stops dividing altogether. (Cancer cells, on the other hand, divide endlessly, leading some scientists to believe that aging is the fate we have to suffer in order not to have cancer.)

Just as older animals have shorter telomeres, so do creatures living under chronic psychological stress. That’s according to the findings of two researchers from the University of California at San Francisco, Elissa Epel and Elizabeth Blackburn and Richard Cawthon of the University of Utah. Their 2004 paper, published in the Proceedings of the National Academy of Sciences, suggests that feeling frazzled (as someone who could at any moment have the nuclear football hiked to him well might) can add years to your cellular age. Their work was what Thea Singer, author of an upcoming book on the science of stress, refers to as the “first attempt to really get to the molecular level regarding stress.”

Epel, an associate professor of psychiatry, and her fellow researchers focused on a group widely acknowledged to have high-pressure jobs: not presidents or even CEOs, but mothers. They studied 58 healthy women, 39 of whom were caring for a child with special needs, and examined the DNA of their white blood cells, which play a crucial role in the body’s immune response to infection.

After adjusting for the women’s ages, the scientists discovered that the more time the women had spent taking care of a special-needs child, the shorter their white-blood-cell telomeres. At a cellular level, at least, they were showing signs of accelerated aging. When quizzed about their own perceptions of their stress levels, the mothers who reported feeling super-stressed also turned out to have significantly shorter telomeres than those who felt more at ease, whether or not they were caring for a disabled child. Outward signs of stress — like looking haggard, as presidents, CEOs and mothers sometimes do — may be a signal of deep-seated decline.

Epel says that the research, which showed an association rather than causation, has now been replicated in several studies and that a link is emerging between telomere length and general bodily aging. “Shorter telomeres underlie certain aged tissues, and one day may even help explain sagging skin,” says Epel.

The question remains whether shorter telomeres indicate a shorter life. Dolly, the short-telomere sheep, is no help. She died young, but not because of her cell structure: She was put down after receiving a diagnosis of a progressive lung disease. Very short telomeres are related to outward signs of aging and premature mortality in
at least one population, says Epel: “People with rare aging syndromes and thus short telomeres have early signs of aging — wrinkles and gray hair — and they die young.”

And, Epel says, there is growing evidence that immune cell telomere length is a predictor of longevity. A new study by Epel and her colleagues, published online last month in a new journal, Aging, goes a further step toward linking accelerated telomere shortening with mortality in men. “The rate of change,” says Epel, “how quickly you are losing (telomere length) is predicting how long people live.”

“We are looking at a biological marker of organismal aging. It’s a very exciting field,” says Epel, who is now investigating whether decreasing stress can slow this aging process.

It’s here that the cell biologists start sounding like the wellness gurus. Epel is exploring whether stress-reduction techniques such as meditation and mindfulness can “slow or reverse immune cell aging.” And at the Cleveland Clinic, Roizen is involved in a program called Lifestyle 180, which, he explains, uses lifestyle changes such as stress management and diet to activate genes that are protective of good health and to deactivate those that cause disease. More work needs to be done, these scientists know. But they are intrigued, as Roizen says, by a growing realization about aging: “The more we look at it — until you end up with structural damage — aging is reversible to a large degree.”

“The mystery about aging,” Epel says, “is why it’s so variable, why some people look so much younger.” Research on centenarians, she explains, suggests that coping effectively with stress is part of healthy aging, that people who get to blow out 100 candles have some trait that allows them to transcend the madness of the moment.

Like Obama’s trademark equanimity? (He was dubbed “the human valium” by one pundit.)

Maybe, thinks Roizen. But, he adds, if Obama is to slow the 2 to 1 aging ratio that he has observed among previous presidents, he will need to keep up his basketball schedule, resist the enticements of the White House chef and maintain close friendships.

Even then, we’re not talking President Peter Pan.

“You can’t stop the clock,” Roizen says, “but you can modify it considerably.”