



Topics and Issues  
*Just for the Health  
of Pilots*

### How to stack the deck in your favor

**T**he caveman was lucky to hit his twenties. A compound fracture, appendicitis, or even an abscessed tooth could mean a sure and painful death. In the times of Charlemagne the life expectancy was about 35 years. In the United States, in 1910 one could expect to live to 50 years. Now, at the turn of the millennium, our life expectancy is 76 years, with women outliving men by about 6-7 years. Is the human life span actually increasing?

The increase is mostly due to medical advances (such as immunizations and antibiotics), public health measures, indoor plumbing, and healthier lifestyles. We are living longer, but there has been no change in the actual human life span. Our genetic clock codes the allotted years for each of us and mankind in general. The maximum length of life Homo sapiens can reasonably expect is about 110-120 years. The longest recorded longevity is that of a French woman, who died at 122. With optimum lifestyles, we can now reasonably expect an active life until 85 or late eighties. People over 85 now make up the fastest-growing segment of our population. A baby born today has about one chance in 25 to become a centenarian.

The Agrarian Age was followed by the Industrial Revolution, and now civilization is well into the Information (and computer) Age. We are now entering the Age of Biotechnology, which will revolutionize life as we know it. By 2003 the human genome project may be completed-revealing our genetic blueprint. It will be one of the most important and difficult accomplishments of civilization-"the moon shot of biology." More than 75,000 human genes containing three billion pairs of coded instructions, will be mapped out. Bio-scientists hope to manipulate some of these genes and introduce them into our bodies, repairing the faulty genes that lead to devastating diseases, such as cancer, hypertension, arthritis, diabetes, muscular dystrophy, and cystic fibrosis-to name just a few of the hundreds of conditions that are inherited.

Bioengineering will aid pharmaceutical companies in making designer drugs, tailored specifically to treat diseases that are now only poorly controlled. Gene

therapy plus disease-specific drugs could-maybe a few decades from now-increase the length of life to the predicted limit of 110-120 years.

A few years ago microbiologists discovered a cellular DNA substance called a telomere, which is thought to control the biological clock for humans. As each cell divides to reproduce itself, some of the end of the telomere is lost. After about 50-100 divisions, a cell is no longer able to live-it becomes senescent and dies. A telomere can be compared to a fuse or to a stick, which keeps the chromosome from "unraveling" and prematurely shortening. It is much like the plastic cuff on the end of a shoelace. (Disease, radiation, free radicals, toxins-anything causing cellular injury-can prematurely shorten telomeres.) When no more cell replication is possible, our genetic clock tells the one trillion cells in the human body "Time's up."

In 1984, molecular biologists made an amazing discovery. An enzyme, which they named telomerase, not only stopped telomere shortening, but even lengthened them. Some cultured cells, exposed to telomerase in the lab, kept dividing, on and on. Was the Methuselah dream in the offing? Probably not-at least for now-since cancer cells are loaded with telomerase. (But, studying telomerase may give us an important clue in fighting cancer.) Even the difficulty of getting telomerase into each cell is considered almost impossible at the present. Still, this is considered one of the most promising discoveries for human longevity.

So, since the Middle Ages, 50 years have been added to our lives. The big question is whether these will be extra happy years to enjoy. Will we be mentally and physically vigorous, or frail and fragile? All of this depends on the lifestyle followed to prepare for the later years. Aim to die young at a very old age. Add life to your years, not just years to your life. Be fit instead of feeble and fragile.

By following all these suggestions you probably can "stack the deck in your favor." You can't live longer than your genetic limit, but could easily have a much shorter life by not taking care of yourself. Don't be warehoused in a nursing home at age 80.

Your health, vigor, and happiness in later life depend largely on your present lifestyle. Prepare for a great time.

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### **Just About Everything You Need to Keep Fit**

*A summary of all the health articles in The Bulletin the past three years.*

- No smoking. Smoking cancels all bets. Also, go easy on the alcohol.
- The next best thing for lifelong good health is exercise. The recommendations are very simple: Twenty or 30 minutes of fairly vigorous aerobic exercise (running, walking, swimming) three or four times a week. Best of all is 30-40 minutes most days of the week. Include weight or resistance training for 15 minutes two or three times a week.

Heavy running alone will give muscular legs and thighs, but the upper body may look almost wasted. Exercise promotes strength, flexibility, and endurance-staving off feebleness in old age. ("Use it or lose it.")  
Why fall and break your hip at 80?

- Get regular exams and screening tests from your own physician. Don't accept off-the-wall advice from charlatans.
- A balanced, varied diet to include fresh vegetables and fruits (lots), whole grain breads and cereals, beans and peas, skinless chicken and turkey, fish, skim milk products-low in fats. Sugar, salt, and fats (especially saturated fat) are the "bad three"-found in the nutritional minefields of vending machines and fast-food restaurants.
- A multivitamin a day, plus 250 milligrams of vitamin C, seems reasonable. The new daily recommendation for vitamin C has been raised from 60 to 120 milligrams. Some physicians recommend adding vitamin E and selenium.
- Don't plan to retire completely. Especially, don't retire both your body and mind. Full retirement might give your body the wrong message (Time to die). A few part-time hours or volunteer work may add further pleasure and meaning to your life.
- Put more money aside for your later years. You are probably going to live 20-40 years past the usual age of retirement. Avoid the anxiety of outliving your savings. ("Will work for food.")
- If you get discouraged, think of Astronaut John Glenn, who went back into space at age 77.
- Wouldn't it be great to look lean? Obesity is a factor in both disease and premature death. Never get more than 10 percent above your optimum weight.
- Stimulate your mind. It needs as much exercise as your body. Try things such as reading, hobbies, adult-education classes, and learning about computers.
- Probably best of all, build close, warm friendships. Everyone needs social companionship. One pilot said, "I was having a tough time with my wife. Big (I thought) problems. Her sister-a great buddy-and I had a long talk, and I finally understood how my wife was thinking. Maybe I had been a jerk. Anyhow, things worked out fine with a little communication. A psychologist or marriage counselor would have done no better, and probably made a federal case out of it. It only cost me an expensive lunch. Cheaper than a divorce lawyer." Shooting the bull and talking with good friends is not a waste of time.
- People with strong family and spiritual commitments seem to weather all stresses more easily. And, they live longer and happier lives.

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*Yours for good health and safe flying,*

Glenn Stoutt, MD

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**Note: The views and recommendations made in this article are those of the author and not necessarily those of the Federal Aviation Administration.**

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