The Challenge of Caring for Elderly Patients

By Bruce H. Robinson, MD, FACS, MSOM (Hon)

With every passing day, one thing is for certain - we’re all getting older. Some of us are closer to the far end of life than others, but the time will come when each of us will be elderly.

At that time we will hope that those who care for us will be alert to the special dangers and the unique challenges of treating those in the elderly age group.

I’d like to begin my discussion with a definition of what we mean by the term geriatrics, as opposed to the far broader term, gerontology.

Geriatrics is the branch of medicine that treats all medical problems associated with aging and the aged.

This field is a subspecialty of internal medicine, as elderly people have different medical problems, different manifestations of illness, and different reactions to medications than younger people, with a narrower "therapeutic window" for beneficial responses to treatment versus adverse effects.

Gerontology is the study of the phenomenon of aging from multiple standpoints, including biology, genetics, medical care, psychology, sociology, anthropology, philosophy, history, and religion. In fact, religious considerations of the process of aging hold special significance for the elderly themselves, as most of us fear death and the likelihood of dying is much higher among those who are well-on in years.

Other words from this prefix include gerodontics: the practice of dentistry for the elderly; gerontophilia: those who are especially attracted to older people and enjoy working with them; and the reverse of this, gerontophobia: a dislike or aversion to elderly people.

What is the age when someone is considered elderly? This is extremely difficult to say in any given individual: some who are 50 seem elderly, and others seem vibrant and youthful when in their 70s, or even older. To arrive at an average, it is rather mutually agreed that we should take age 65 as the dividing line. In terms of the actual potential for human longevity, 65 is rather closer to the middle than to the far end, but most of us when we turn 65 realize we are getting older and we may feel it as well.
**Sociological implications of the aging process**

In 1980 there were 15,000 centenarians in the United States. Now, in 2012: there are calculated to be 71,000.

By the year 2050, it is expected we will have 1 million centenarians living among us. How healthy will all these old folks be? That is a good question.

For certain, we are an aging population. The percentage of all patients seen in U.S. medical clinics that are over 65 in 2005 was 33 percent. Now, in 2012 this percentage has jumped to 50 percent. The dramatic increase is due to the surge of baby boomers born during WWII that have become over 65. Our national need for nursing homes (ECFs, or SNFs) will increase rapidly as these baby boomers become elderly over the next few years.

How are the elderly treated? Increasing age brings increasing respect in Asian, Hispanic and African cultures. My experiences during my three extended trips to China were very meaningful and intense in this respect. All of them occurred when I was in my mid-60s. As an older person, I was treated to the most profound respect I could have imagined. A respectful way is inborn in the Chinese anyway, but they went overboard in this regard with me during my tours of Beijing, Shanghai, Tianjin, and many cities in the more inland portions of China.

Such increased respect for the elderly is not quite so pronounced in the U.S., Canada, Australia and New Zealand, as well as in other Northern European countries. Quite often the elderly are set aside. They either live by themselves and feel lonely about it, or they are placed in retirement centers, or they self-select to live in these centers. This occurs because their family is moving on with their lives and the grandparents feel left out. This may be a reflection of the fact that extended families are not as tightly held to or as important in our northern European/American cultures than they are in Asia, in Hispanic countries and among the African American and African Caribbean cultures.

**Clinical Implications of the Aging Process**

The processes of aging make the patient more susceptible to diseases and less tolerant of stress than when younger. We should think in terms of thresholds: what threshold of a certain stress will lead to disease? Old age does not imply the presence of disease, just its increased likelihood due to a narrow threshold for the ravages of environmental toxins, infections, accidents, and stress.
Many old people (over 70) are very healthy. Yes, they’ve slowed up a bit, but they can often still play tennis well, ski down those black diamond runs (assuming they’re experts), dance until midnight, and even run marathons. Old people should not be thought of as victims. They are the survivors.

The TCM medical practitioner’s role is to enhance the coping abilities and the coping repertoire of his/her older patients. TCM practitioners have a large tool kit to utilize, and it is ideally suited for the treatment of the elderly. Encourage your older patients to remain active, because those involved in work or volunteer activities clearly live longer and stay healthier than those who don’t. Many studies have revealed that older people in long-term nurturing relationships feel even closer in their old age, and they live longer as a result.

Studies of cultures where people live the longest and healthiest have four things in common:

- A moderate diet of mostly fruits and vegetables with relatively little fat and meat.
- Work continues throughout life.
- Family and community are important, with integration of all the generations.
- Exercise and relaxation are a part of the daily routine, with time for rest, usually lots of walking, and interaction with others in the community.

**Physical implications of aging**

Recovery from surgery or trauma is delayed in the elderly, who are also at risk for more complications.

Most organ systems lose function starting at age 35 at the rate of about 1% per year (from cross-sectional comparisons of groups at different ages). It is also true that physical conditioning reduces or delays many changes that otherwise occur in the lungs, muscles, brain, and heart, but certain changes with aging do nonetheless occur. No one can stop them.

Those who live to be old can attribute about 35% to their genes and 65% to their lifestyle, relationships, environment, and good luck. Maybe good luck is actually less important than one’s karma. According to this concept, the effects of all of one’s deeds in the past actively create present and future conditions and living experiences that are either negative or positive, depending on what the person has built up over the years. As the old saying goes, ”The chickens come home to roost.”

Biological aging refers to the processes that go on in the body that are not caused by disease, but simply with time. These changes tend to occur in all older people. The rate of these degenerative changes depends
on genetics, nutrition, and physical fitness, but they cannot be stopped altogether.

**What happens:**

**Overall:**

- decreased height (vertebral compression and increased kyphosis)
- decreased weight, over age 80
- increased fat to lean-body ratio
- decreased water content in body

**What happens in specific organ systems as a result of the aging process:**

**Skin:**

- increased wrinkling, gradual atrophy of skin
- atrophy of sweat glands, affecting thermo-regulation

**Kidneys:**

- interstitial fibrosis
- decreased renal blood flow
- decreased creatinine clearance
- decreased maximum urine osmolarity during body dehydration (decreased concentration of urine)

**Cardiovascular system:**

- elongation and increased tortuosity of arteries
- intimal thickening of arteries
- fibrosis of media of arteries
- sclerosis of heart valves (esp. aortic valve)
- decreased cardiac output with exercise
- decreased heart rate response to stress and exercise
- decreased elasticity and compliance of all arteries and veins
Lungs:

- decreased elasticity of lungs
- decreased activity of mucociliary escalator in bronchial passages

Gastrointestinal Tract:

- slower intestinal motility
- decreased hydrochloric acid secretion
- decreased number of taste buds

Skeleton:

- Osteoarthritis
- Osteoporosis

Eyes:

- Decreased widening of pupils
- Arcus senilis (grey line around the limbus of the eye; of uncertain significance)
- Growth and thickening of lens, with less accommodation
- Development of cataracts in the lens
- Hyperopia (decreased ability to see things that are close)
- Decreased visual acuity, depth perception, color perception

Nervous system:

- Decreased brain weight, cortical cell count
- Increased motor response time
- Decreased fluid intelligence activity (deterioration starts at age 17)
- Stable or increased crystalline intelligence (judgment, wisdom)
- Decreased short-term memory
- No change in long-term memory
- No change in implicit memory (as in tying your shoes; riding a bike)
- No change in sustained attention
- Decreased selective attention and divided attention (affects driving skills)
- Decreased sleep time per night
- Decreased hours of REM during sleep

Immune system:

- Decreased T cell activity
- Decreased activity of natural killer cells
- Decreased destruction of mutated cells that can become cancer

Endocrine system:

- Decreased T3 (triiodothyronine)
- Decreased testosterone
- Increased insulin
- Increased norepinephrine, parathormone, vasopressin

A clinician’s knowledge of these changes in older people will help inform his/her choice of approaches to treatment, to achieve the maximum beneficial effect. These organ changes diminish the ability of elderly patients to tolerate serious side effects of medications, and it makes them more likely to acquire diseases.

**Theories of Aging**

These have been condensed in recent years into two master theories. Both seem to be operative.

The first theory of aging is the sociobiological theory. According to this theory humans have selected out the gene pool over thousands of years that enables us to mature, chose the best mates we can have, and raise our children. We then die, to allow for the upcoming generation to have enough living space and resources. Basically, to be blunt about it, we die to get out of the way.

Thus, the regulation of specific genes causes our genetically programmed senescence. It’s not understood exactly how this happens. Therefore we all have an inborn genetic clock that determines how long we can live, based on our genes and our lifestyle. The length of a long human life has not changed over historical time. It was the same in biblical days as it is now; it’s just that fewer people in the past survived the rigors of life to live into their 80s or 90s, but some did.
When we study other mammals we can also see this genetic clock in operation. Maximum genetic life-spans in mammals (not often achieved by individual animals):

- Hamsters – 3 years
- Rats – 4 years
- Rabbits – 13 years
- Dogs – 20 years
- House cats – 30 years
- Tigers – 26 years
- Brown bears – 37 years
- Chimpanzees – 55 years
- Elephants – 70 years
- Humans – 125 years (this is our potential!)
- Humpback whales – 100 years or more (a bow whale was proven recently to be 211, and some humpback whales have been proven to be 150)
- Giant tortoises – 180 years, or longer (maybe over 200)

Some researchers have correlated longevity with heart rate: the concept that all advanced organisms, even when fully healthy, have only so many heart beats in them and then they die. Thus hamsters have a heart rate of 450/min and live 2-3 years. Humans have a heart rate of 70/min. Large whales have a resting heart rate of 7-10 beats per minute. This is intriguing research that makes sense.

Can we live up to our potential to achieve the age of 125? Few of us do, but there is a long list of super-centenarians that are documented to be over 110. The oldest living human in March, 2012 that we are certain about is Besse Cooper, United States: born 26 August, 1896. This August, Besse will be 116. Then there is Sarkahn Desova, Kazakhastan, who is said to be 130 (she has a passport, ID card, and other records to support this). Pictures of her deeply lined, but alert face do suggest this length of her lifespan, but her age has not been documented with foolproof accuracy.

Supporting this idea of an inborn genetic clock is the disease progeria. This is a genetic defect in humans, in which those with this disease have a genetic aging clock that is set too fast. The overly-fast genetic clock leads to premature, rapid aging. Such a person is elderly at the age of 13 to 16. Death comes due to old age, often before age 20. Photos of those with this disease at the age of 13 are very striking.
The second theory of aging is the accumulation of damage to informational molecules in our cells. There is spontaneous mutagenesis over time as cells age and mitosis becomes less efficient. There is a failure of DNA repair systems, with a loss of telomere length (cancer cells have telomerases and do not age. They can live forever in the laboratory in an incubation dish). Research has shown that fibroblasts in vitro have 50-60 doublings in young patients, less in older patients; then they finally stop doubling and die.

According to this theory superoxide radicals build up in cells that can react with DNA, RNA, proteins, and lipids, causing cellular damage. This process is opposed by taking Vitamin C, E, lycopenes, or selenium.

There is interesting research on the damage to informational molecules in cells because of excess oxidation:

- Caloric restriction lowers oxidative stress in cells of rodents, with less cellular damage and extended lifespan.
- Increasing expression of antioxidative enzymes extends life of fruit flies.
- Growth-factor gene in mice is also shown to cause aging. Mice selected without this gene are smaller but lived longer: "Mousesuzela Project" to raise a mouse that lives for 10 years is ongoing.

Both of these theories appear to be operative. Our genes set our own clock for getting older and eventually dying. The oxidative changes in our cells causes them to get old and eventually to die. When enough of our cells die, we also will die.

The concept of how best to thrive and stay as healthy as possible in the later years of life is important for all of us, not only for ourselves but for our patients and also our loved ones.

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