

# Physical and cognitive development in late adulthood

[Technology](#), [Development](#)



- Functional age is the actual competence and performance a person displays, regardless of chronological age. People age biologically at different rates:
  - o Young-old elderly appear physically young for their years.
  - o Old-old elderly appear frail and show signs of decline.
- Life Expectancy
  - Average life expectancy is the number of years that a person born in a particular year can expect to live. This has to do with nutrition, medical treatment available, safety. This has changed dramatically since 1900, when the average life expectancy was less than 50 years.

Today, a person born in 2000 can expect to live 74 years (M) or 80 years (F). Certain death rates have declined greatly- especially heart disease- has dropped by 50% in the past 30 years due to declines in high blood pressure and smoking risks.

- Variations in life expectancy relate to gender (women can expect to live 4-7 years longer than men due to the protective factor of the extra X chromosomes. )
- White people will generally outlive African-American people and Native-American people.

This seems related to higher rates of infant mortality, unintentional injuries, life-threatening disease, poverty-linked stress, and higher levels of violent death in low-SES minority groups. Quality of life can be predicted by a country's health care, housing and social services.

- o Active lifespan is the number of years of vigorous, healthy life a person born in a particular year can expect. Japan is first, and the US is 24th. Japan has a low rate of heart disease due to the low-fat diet, along with good health care and positive policies that benefit the elderly.

In developing nations the life expectancy is closer to 50 years, and active lifespan is shorter- 44 in Haiti, 38 in Afghanistan, 26 in Sierra Leone. • Life expectancy in late adulthood- in the US, people age 65+ have grown in numbers- in North America, they have increased from 4% to 13%. The fastest growing group of elders is those 85+. The gender difference expands with age- at 65 there are 111 women per 100 men. At 85+ there are 160 women for 100 men. o Life expectancy crossover – surviving members of low-SES ethnic minority groups live longer than members of the white majority.

Perhaps only the sturdiest males and females of low-SES groups survive into very old age, so they actually can outlive those in more favored groups. After people reach 75 years, heredity is not the same impact that environment is- now lifestyle makes the difference- diet, normal body weight, exercise, little substance use, optimistic outlook, low stress and social support. • Maximum lifespan is the genetic limit to length of life free of external risk factors. 85 seems about average, but the oldest verified age is 122. Physical changes • Centenarians' secrets – centenarians have increased 10 times in the past 40 years.

Women outnumber men by 4/1. 60-70% have disabilities that prevent independent living, but many lead active lives. What do they do differently? o Health and longevity seems to run in families, so there is an inherited aspect to long lived survival. They also haven't had many chronic illness. They have efficient immune systems and few brain abnormalities. Most never smoked and were physically active into their late years. o Personality

is optimistic, not fear-driven. They score high in independence, hardiness, emotional security and openness to experience.

They also cite close family bonds and a long and happy marriage. o Activities include community involvement, work, and leisure activities and continued learning. • Nervous system impairments show up more after age 60, as the brain tissue declines due to loss of neurons and larger ventricles within the brain. As many as 50% of neurons may die in the visual, auditory, and motor areas of the brain. The cerebellum, which controls motor coordination, loses about 25% of neurons. Even so, aging neurons can establish new synapses in the wake of lost neurons.

So parts of the brain compensate for lost parts. Temperature management is poorer as the autonomic nervous system is less efficient. So elderly are at greater risk during extreme weather. • Sensory Systems – there is reduced sensitivity with aging. o Vision is reduced in dim light, and in nearby focus, as well as color perception. The cornea becomes more translucent and scatters light which blurs images. The lens yellows which affects color discrimination. ? Cataracts are cloudy areas in the lens which blur vision and can cause blindness if there is no surgery.

There is poorer dark adaptation when coming in from the light. Depth perception is also compromised since binocular vision declines, as well as visual acuity. Macular degeneration occurs when light-sensitive cells in the macula, the central region of the retina break down, resulting in blurry central vision, and eventual blindness. A diet high in anti-oxidants can delay

this condition. Driving may need to be curtailed at a certain point, as the older driver has a harder time discriminating the road distractions and signs.

This is a hard thing to give up, since it signals physical dependence on others. Elders also are at higher risk of stumbling and serious falls at this point, as they don't see changes in the floor and accommodate smoothly. o Hearing is impaired with reduced blood supply and death of the sense organs in the ear, the cilia, as well as the auditory cortex in the brain. The eardrum also stiffens, so not as much sensation gets to the inner ear. High frequencies are first to go. It is harder to distinguish speech in loud environments, especially after age 70.

Hearing loss can affect safety, especially for pedestrians and drivers. Deafness is isolating, as people lose patience trying to communicate with deaf people. It also links to a certain paranoia, as deaf people fear others are talking about them. Many people learn to read lips as they experience hearing loss, so there are adaptations that can be made, if others will cooperate and help. o Taste and smell declines somewhat, and people may have difficulty recognizing familiar foods by taste alone. It may be due to dentures, smoking, medications or even strokes.

If food tastes less, it is also less appealing, so diet may become poorer. Smell is also related to enjoying food, but also protects the person from bad food, gas fumes, or smoke. Smell receptors are lost after age 60, and odor perception often becomes distorted in late adulthood. o Touch perception declines after age 70. There is a loss of touch receptors as well as a slowing

of blood circulation in the extremities. • Cardiovascular and respiratory systems are affected by aging as the heart muscle becomes more rigid and some cells enlarge, thickening the left ventricle.

Arteries stiffen and accumulate plaque. So the heart pumps with less force, and blood flow slows. So during activity, sufficient oxygen may not be delivered to critical tissues. Lung tissue also loses elasticity, & capacity is reduced by half. The blood absorbs less oxygen and expels less carbon dioxide. People feel more out of breath when exercising. This is more of a problem for people who have smoked, had a high-fat diet, or been exposed to pollutants. Exercise facilitates respiratory function.

• Immune system declines as T cells become less effective. Auto-immune response is a problem when the immune system turns against normal body tissues. This puts elders at risk of infectious diseases, CVD, cancers, rheumatoid arthritis, or diabetes. The more impaired the immune system is, the more at risk the person is to a variety of agents. • Sleep is essential for healthy functioning all one's life, but as we age, sleep is harder to come by, as elders sleep less, more lightly, and have more trouble going to sleep.

Men seem to have more sleep problems than women, due to the enlargement of the prostate gland and the need to urinate more often at night. Sleep apnea is a condition where breathing ceases for 10 sec. or more, causing the person to awaken with a start to breathe again. This afflicts more men than women, but overweight people have problems with this condition, as more weight is pressing on the lungs, requiring more effort to

keep breathing. Legs also move rapidly during the night- “restless legs” and this can disrupt sleep, too. Unfortunately poor sleep can afflict daytime energy, resulting in a cycle of downward energy, even depression.

More prescriptions for sleep aids are given to older adults, but they can have rebound effects later with greater insomnia. • Physical appearance and mobility involve changes in the skin, hair, facial structure, and body build. The face most often shows the ravages of aging skin. The only structures to continue to grow are the nose and ears, as cartilage continues to grow. Hair thins and loses pigment. Height declines as the spine collapses with bone loss. Mobility declines as muscle strength declines- 30 – 50% declines after ages 70.

Stretching exercises can reduce this decline. Adapting to physical changes of late adulthood – we can do much more to improve physical and cognitive skills than to delay wrinkling or external signs of aging, but many products are hawked because people are more willing to spend money on products than do the hard work of staying active. o Coping strategies include both problem-centered and emotion-centered coping. The more people take charge of their lives the greater control they feel about their fates. People can use compensating techniques to adapt to sensory losses, if they will make the effort. The more passive people are, the more they report negative adjustment to life. o Assistive technology is devices that permit people with disabilities to improve their functioning.

They include computers, phones that can be dialed by voice command, or print out the speech of the caller allow blind or deaf elders to maintain independence. A computer chip can be placed on medicine bottles to remind elders to take meds on schedule. Smart homes promote safety and mobility.

o Stereotypes of aging include the idea that “ deterioration is inevitable” and result in younger people talking down to elders, or ignoring them entirely.

The more negatively stereotyped elders are, the more negatively their response to stress, producing poorer handwriting, memory, and will to live. The more control seniors are allowed, the longer they live, and the better their quality of life is. The more positive a culture views its elders, the better quality of life those elders sustain.

- Cultural differences in aging – in many varieties of culture, elders fare best when they retain social status and opportunities for community participation. The more they are excluded from social roles, aging reduces well-being.

A tribe in Botswana treats aging as a marker of wisdom even making the eldest man and wife the village leaders. And as other elders become frail, children are sent to care for them, but it is considered a role of pride and prestige. In cultures where elders are segregated, they tend to dwell more on their disabilities and exclusion from younger, more powerful members of society. There develops a resentment between the generations, instead of an integration and enhancement of wisdom due to learning from the elders.