Physical Development in Late Adulthood

The aging process often results in a loss of memory, deteriorated intellectual function, decreased mobility, and higher rates of disease.

LEARNING OBJECTIVE

• Identify how older adults' brains change and how this impacts their functioning

KEY POINTS

• During late adulthood the skin continues to lose elasticity, reaction time slows further, muscle strength and mobility diminishes, hearing and vision decline, and the immune system weakens.

• The aging process generally results in changes and lower functioning in the brain, leading to problems like decreased intellectual function and neurodegenerative diseases such as Alzheimer's.

• Many of the changes in the bodies and minds of older adults are due in part to a reduction in the size of the brain as well as loss of brain plasticity.

• Memory degenerates in old age, so older adults have a harder time remembering and attending to information. In general, an older person's procedural memory tends to remain stable, while working memory declines.

TERMS

• Alzheimer's disease
  A disorder involving loss of mental functions resulting from brain-tissue changes; a form of senile dementia.

• neurodegenerative
  Of, pertaining to, or resulting in the progressive loss of nerve cells and of neurologic function.

• cerebellum
  Part of the hindbrain in vertebrates; in humans it lies between the brainstem and the cerebrum and plays an important role in sensory perception, motor output, balance, and posture.

• corpus callosum
  In mammals, a broad band of nerve fibers that connects the left and right hemispheres of the brain.

Physical Changes

Late adulthood is the stage of life from the 60s onward; it constitutes the last stage of physical change. Average life expectancy in the United States is around 80 years; however, this varies greatly based on
factors such as socioeconomic status, region, and access to medical care. In general, women tend to live longer than men by an average of five years. During late adulthood the skin continues to lose elasticity, reaction time slows further, and muscle strength diminishes. Hearing and vision—so sharp in our twenties—decline significantly; cataracts, or cloudy areas of the eyes that result in vision loss, are frequent. The other senses, such as taste, touch, and smell, are also less sensitive than they were in earlier years. The immune system is weakened, and many older people are more susceptible to illness, cancer, diabetes, and other ailments. Cardiovascular and respiratory problems become more common in old age. Seniors also experience a decrease in physical mobility and a loss of balance, which can result in falls and injuries.

Changes in the Brain

The aging process generally results in changes and lower functioning in the brain, leading to problems like memory loss and decreased intellectual function. Age is a major risk factor for most common neurodegenerative diseases, including mild cognitive impairment, Alzheimer's disease, cerebrovascular disease, Parkinson's disease, and Lou Gehrig's disease.

While a great deal of research has focused on diseases of aging, there are only a few informative studies on the molecular biology of the aging brain. Many molecular changes are due in part to a reduction in the size of the brain, as well as loss of brain plasticity. Brain plasticity is the brain's ability to change structure and function. The brain's main function is to decide what information is worth keeping and what is not; if there is an action or a thought that a person is not using, the brain will eliminate space for it.
Alzheimer’s disease (AD) is a neurodegenerative disease and is the most common form of dementia in older adults.

Brain size and composition change along with brain function. Computed tomography (CT) studies have found that the cerebral ventricles expand as a function of age in a process known as ventriculomegaly. More recent MRI studies have reported age-related regional decreases in cerebral volume. The brain begins to lose neurons in later adult years; the loss of neurons within the cerebral cortex occurs at different rates, with some areas losing neurons more quickly than others. The frontal lobe (which is responsible for the integration of information, judgement, and reflective thought) and corpus callosum tend to lose neurons faster than other areas, such as the temporal and occipital lobes. The cerebellum, which is responsible for balance and coordination, eventually loses about 25 percent of its neurons as well.

**Changes in Memory**

Memory also degenerates with age, and older adults tend to have a harder time remembering and attending to information. In general, an older person’s procedural memory stays the same, while working memory declines. *Procedural memory* is memory for the performance of particular types of action; it guides the processes we perform and most frequently resides below the level of conscious awareness. In contrast, *working memory* is the system that actively holds multiple pieces of transitory
information in the mind where they can be manipulated. The reduced capacity of the working memory becomes evident when tasks are especially complex. *Semantic memory* is the memory of understanding things, of the meaning of things and events, and other concept-based knowledge. This type of memory underlies the conscious recollection of factual information and general knowledge about the world, and remains relatively stable throughout life.