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# THE PRACTICAL HANDBOOK OF CLINICAL GERONTOLOGY



LAURA L. CARSTENSEN, PH.D.  
BARRY A. EDELSTEIN, PH.D.  
LAURIE DORNBRAND, M.D.  
EDITORS

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# I

## General Issues in the Treatment of the Elderly





# 1

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## Psychological Perspectives on the Normal Aging Process

*Susan Krauss Whitbourne*

That the aging process is, fundamentally, “normal” is one of the undeniable facts of human life. Yet the definition of *normal aging* is far less clear. In this chapter, I will describe a set of physical and cognitive changes in later adulthood that are considered to be the result of the normal aging process. Although it is true that as individuals age, they are at greater risk of developing chronic health problems such as arthritis, cardiovascular disease, diabetes, and sensory impairments, these conditions are not inherent in the aging process. This distinction between normal aging and disease is important for mental health providers to be able to recognize for the purposes of both diagnosis and treatment. Symptoms of depression and anxiety related to the presence of disease may be lifted when the underlying disease is treated. Normal age-related changes may also contribute to psychological distress, and even though these changes may not be reversible, compensatory measures can be taken to improve the individual’s emotional well-being.

Relevant to these points is that fact that there are wide individual differences in reactions to aging as well as differences in the rates of aging. Many effects

vary tremendously in the rates at which they occur, both from person to person and within the same person, from one bodily system or psychological function to another. The rate of aging is determined in part by genetic factors and in part by the individual's behavior to compensate for or accelerate the aging process. In many cases, "bad habits," such as cigarette smoking, inactivity, and poor diet, can increase the individual's vulnerability to disease or deleterious effects of aging. By contrast, it is often the case that taking advantage of the "use it or lose it" principle, involving exercise and other attempts to maintain functioning, can help slow or offset the physical and psychological consequences of aging.

Personality and self-concept clearly play interactive roles in understanding physical and cognitive aging processes (Whitbourne, 1987). It is useful to conceptualize the individual's reaction to aging in terms of the meaning that specific age-related changes have for sense of competence, mastery, and sense of the self as continuous over time as well as the ability to adapt to the environment. For certain individuals, changes in particular aspects of functioning may prove extremely threatening to identity because these changes involve loss of particularly valued abilities or characteristics. Individuals may react defensively to these changes, either pretending that they have not in fact occurred or attempting to overcompensate by engaging in a series of desperate measures to prevent any further deterioration. Other age-related changes not as central to identity may be perceived and reacted to in a more neutral, dispassionate manner. In developing therapeutic interventions, it is essential to understand the meaning of a particular age-related change for the individual in terms of lifelong patterns of activity, behavior, interests, and personality. Within this context, suggestions can be made to help the individual by adapting coping strategies and other cognitive interventions for reducing stress (Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984). For example, the individual can be helped to compensate for certain changes using a variety of problem-focused coping strategies, such as planful problem solving. If the availability of compensatory measures is limited, the clinician can help the individual accommodate to these changes through, for example, positive reappraisal and other emotion-focused forms of coping. In this chapter, I will outline the major physical and cognitive changes associated with the aging process and present suggestions for compensatory measures that can be incorporated into such intervention strategies for older adult clients.

### **Normal Age-Related Changes in Physical Functioning**

The physiological changes associated with the aging process occur as the result of an inexorable process that moves the individual ultimately toward death. The cause of aging is not yet known, and there are many theories that

attempt to address the underlying mechanism that manifests itself in the aging of the body. Yet it is clear that the human body is remarkable in its ability to maintain its functional competence and integrity over time despite deleterious physiological changes. Rather than simply deteriorating until the end of life, the body actively attempts to integrate the deleterious changes in its tissues into new levels of organization to preserve life and functioning for as long as possible. As I review the changes in the body with age, it is important to keep this point in mind, as the aging of the body is not synonymous with the aging of a machine (Whitbourne, 1986). In each of these areas, I will develop the themes of the interaction of physical aging with psychological processes and the ways that individuals can affect the physical aging process through their own behaviors.

## APPEARANCE

The signs of aging are most apparent in the aging of the individual's appearance. Contributing to the aging of appearance are changes in the skin, hair, facial structures, and body build. For the most part, the effect of these changes is cosmetic; however, there are ramifications of the aging of these structures for the individual's overall physical functioning.

*Skin.* The development of creases, discoloration, furrows, sagging, and loss of resiliency are the most apparent changes in the skin. The processes responsible for these changes have a negative effect on the skin's protective functions as well as its appearance. There is less insulation provided against extremes of temperature and less of a barrier against environmental agents that can irritate the skin and cause dermatitis (Grove, 1989). Dryness, sagging, and wrinkling of the skin on the face and body can also lead to discomfort (Kligman, 1989). There are also alterations in the immune responsiveness of the skin and, along with a diminished blood supply to the skin, the immune system's response to surface inflammation is reduced (Balin & Pratt, 1989).

*Hair.* With increasing age in adulthood, for both men and women, the hair on the head and body loses its pigmentation and becomes white due to decreased melanin production in the hair follicles. The extent to which a person's hair begins to appear gray depends on the rate at which colored hairs turn white and the original hair color into which the white hairs become mixed. For both men and women, hair on the face becomes coarser and longer, and men may develop long hairs on the external canal of the ear (Whitbourne, 1986).

*Face.* Changes in the appearance of the face represent changes already discussed in the skin and hair as well as changes in the bones of the face

comparable to bone changes throughout the body. The structure of the face changes as the nose and ears become longer and broader and the jaws lose bone causing them to shrink in size. Changes in the teeth occur, including tooth loss, discoloration, and chipping. The need to wear eyeglasses, due to changes in vision, may lead to a striking change in appearance. Wrinkling, puffiness, and deepening of pigmentation around the eyes cause the eyes to appear more sunken. In addition, the cornea loses brightness and translucency.

*Body Build.* It is well established that over the course of adulthood, there is a consistent pattern of a reduction in standing height, occurring at a greater rate after the 50s and particularly pronounced in women (Adams, Davies, & Sweetname, 1970; Shephard, 1978). Not only is there a height decrease, but there are changes in the overall shape of the body due to altered distribution of body fat starting in middle age. Based primarily on cross-sectional studies but also consistent with clinical experience, it is well documented that weight increases from the 20s until the mid-50s, after which total body weight declines. Body fat distribution also changes over the course of adulthood, with subcutaneous fat decreasing in the extremities and increasing in the abdominal area for both men and women (Shephard, 1978).

### *Psychological Interactions*

As the individual's appearance changes in later adulthood, the potential exists for his or her identity to change in corresponding ways, some of them negative. Comparisons of present appearance with pictures or memories of early adulthood can be damaging to self-esteem to people who valued their youthful image (Fenske & Albers, 1990; Kleinsmith & Perricone, 1989). At the same time, others may be repulsed by the wrinkles, discolorations, and white hair of the older person, causing the aged individual to feel rejected and isolated (Kligman, 1989). These changes involve primarily the face but can also include changes in exposed areas of the body. With regard to body build, changes in body fat and muscle tone that lead to the appearance of a sagging or heavier body shape can result in increased identification of the self as moving away from the figure of youth. The development of "middle-aged spread" is one of the first occurrences to trigger recognition of the self as aging, even before the first gray hairs have become fully evident.

### *Compensatory Measures*

Short of cosmetic surgery, there are many steps that older individuals can take to slow, compensate for, or correct the changes in appearance caused by aging of the skin. The primary method of prevention, which must be started

early in life, is for fair-skinned people to avoid direct exposure to the sun and to use sunblock when exposure cannot be avoided (Gilchrest, 1989). Cigarette smoke can also be harmful to the skin.

There are many possible ways for the individual to compensate for age-related changes in the skin once they have become manifest. To counteract the fragility, sensitivity, and dryness of the skin, the individual can use sunscreens, emollients, and fragrance-free cosmetics. As it is traditional for women to use facial cosmetics, the proper choice of color and coverage techniques can enhance the individual's appearance (O'Donoghue, 1991). Changes in body build can be compensated, often remarkably so, by regular involvement in activities and exercise that maintain muscle tone and reduce fat deposits under the skin.

## MOBILITY

The ability to move about through one's physical surroundings is a function of the smooth coordination of the body's joints and muscles and the associated tendons and ligaments. Movement is also made possible by the bones, which must be both strong and resilient. The normal aging process results in changes in all these structures, leading to the possibility that the individual will become limited in the ability to carry out desired movements and actions.

*Muscles.* There is little reduction in muscle strength until at least age 40 or 50 years, a 10% to 20% decrease thereafter until about age 50 or 60 years, and a 30% to 40% decrease by the 70s and 80s. Loss of muscle strength is more pronounced in the legs than the hands and arms (McArdle, Katch, & Katch, 1991).

*Bones.* The overall pattern of bone development in adulthood is a progressive loss of bone strength, due primarily to a loss of bone mineral content as the rate of resorption exceeds that of new bone apposition. The decrease in various measures of bone strength ranges from 5% to 12% per decade from the 20s through the 90s (McCalden, McGeough, Barker, & Court-Brown, 1993). In part, bone density and the loss of bone mass in the later years of adulthood may be a function of genetic factors (Dargent & Breart, 1993; Kelly et al., 1993). Lifestyle also seems to play a role, however, including factors such as physical activity, smoking, alcohol use, and diet, which can account for 50% to 60% of the variation in bone density (Krall & Dawson-Hughes, 1993). There are also hormonal influences on bone mass, as indicated by the observation that bone mineral loss in women proceeds at a higher rate in postmenopausal women, who are no longer producing estrogen in monthly cycles

(Nutti & Martini, 1993). In addition to a total loss of bone mineral content, the bones become more brittle and porous so that they are less resistant to stress and more likely to undergo serious fracture than the bones of younger persons (Whitbourne, 1986).

*Joints.* Age-related losses have been documented to occur in every structural component of the joints, including the tendons, ligaments, synovial membranes, synovial fluid, and arterial cartilage (Brooks & Fahey, 1984). Joint functioning peaks in efficiency in the 20s and decreases continuously thereafter (Bortz, 1982) with accelerating decreases after the 60s (Bassey, Morgan, Dallosso, & Ebrahim, 1989; Vandervoort et al., 1992).

### *Psychological Interactions*

Degenerative changes in the muscles and joints, whether due to disease or the normal aging process, have many pervasive effects on the individual's life and are a major source of disability (Hughes, Cordray, & Spiker, 1984; Hughes, Edelman, Singer, & Chang, 1993). Restriction of movement in the upper limbs rules out many enjoyable leisure activities and can make it difficult for the individual to perform occupations that require finely tuned motor skills and repetitive movements of the hand and arm. Pain and lack of flexibility in the legs and feet can slow the individual's pace when walking. Restricted movement of the hip leads to a number of restrictions, such as limping, difficulty climbing stairs, and rising from a chair or sofa. Involvement of the knee adds to these difficulties. Degenerative changes in the spine, in addition, often result in back pain that, if not restrictive in and of itself, has the constant potential to detract from the individual's enjoyment of both occupational and recreational activities. This restriction of activities, combined with the experience of pain, may lead the individual to suffer from clinical symptoms of depression (Williamson & Schulz, 1992a). In part, the effects of mobility loss can be attributed to the enforced reliance on others that is created, leading to other deleterious processes, such as being treated like a dependent child (Whitbourne & Wills, 1993).

One of the most deleterious outcomes of reduced muscle strength, bone strength, and joint mobility is the heightened susceptibility of older individuals, particularly women, to falls and to serious consequences resulting from falls (Kelsey & Hoffman, 1987; Lord, Clark, & Webster, 1991a). Community survey estimates of the prevalence of falling range from 32% (Tinetti, Speechley, & Ginter, 1988) to 42% (Downton & Andrews, 1990) to 53% (Walker & Allen, 1991). Over 250,000 patients are hospitalized each year in the United States for treatment of fractured hips (Allegrante, MacKenzie, Robbins, & Cornell, 1991). There are a number of interacting age-related processes that

operate to increase the older adult's likelihood of suffering from a disabling fall, including musculoskeletal changes and sensory losses (Woollacott, 1993) and an increased likelihood of tripping over obstacles (Chen, Ashton-Miller, Alexander, & Schultz, 1991). Those elderly who are most at risk of falling include people who suffer, in addition to bone loss, from visual impairment, neurological deficits, gait disturbance, loss of muscle strength and coordination, and health problems requiring certain medications (Craven & Bruno, 1986; Felson et al., 1989; Kelsey & Hoffman, 1987; Lipsitz, Jonsson, Kelley, & Koestner, 1991; Lord, Clark, & Webster, 1991; Maki, Holliday, & Topper, 1991; Morse, Tylko, & Dixon, 1987; Nevitt, Cummings, & Hudes, 1991). Weakness and limitations in range of movement of the ankles and knees play an important role in heightening the risk of a fall due to the individual's inability to avoid obstacles (Whipple, Wolfson, & Amerman, 1987). Cognitive impairments, particularly those associated with Alzheimer's disease, contribute further to heightened risk of falling (Morris, Rubin, Morris, & Mandel, 1987; Spar, LaRue, Hewes, & Fairbanks, 1987; Tinetti et al., 1988). Psychological factors, such as anxiety and depression, also increase the older individual's risk of falling (Tinetti, Richman, & Powell, 1990). Disability and a history of smoking are two final contributing risk factors (Vetter & Ford, 1989).

The experience of a fall can lead to a vicious cycle in which one fall leads the individual to become fearful of more falls, and as a result, to walk less securely and confidently. This loss of a sense of security can serve to increase the risk that older persons will lose their balance and actually make them more likely to fall in the future. The experience of falling can also lead individuals to develop low self-efficacy about themselves as being unable to avoid a fall, further impairing their balance and gait (Downton & Andrews, 1990; Tinetti et al., 1990). Apart from the physical risk factors that increase the likelihood of falling, there exist psychological variables related to elderly persons' attitudes toward their abilities and senses of security (Tinetti & Powell, 1993). Even without actual bone fracture, then, the older adult may experience some of the psychological consequences associated with lessened mobility. Furthermore, necessary daily activities that were previously conducted with little concern, such as descending a steep flight of stairs or walking on icy pavement, may create fear and hence avoidance. The experience of falling, in this sense, might precipitate rapid realization of aging regarding the fragility of the bones and lead to a loss of autonomy and sense of competence.

### *Compensatory Mechanisms*

Counteracting the picture of inevitable decline in muscle strength is evidence, accruing from the 1970s, showing that a regular program of exercise can help the middle-aged and older adult compensate substantially for the loss

of muscle fibers. Although there is nothing that can be done to stop the loss of muscle cells, the remaining fibers can be strengthened and work efficiency increased through exercise training, even in persons as old as 90 years (Fiatarone et al., 1990; Grimby & Saltin, 1983; see also Chapter 2, this volume). Inactivity is a bad habit that can accelerate the loss of muscle strength, and the same is true of bone loss. It appears that older individuals can benefit from resistance training exercises that, within limits, increase the stress placed on the bone (Dalsky, 1988; Rikli & McManis, 1990; Smith, 1981). Although degenerative changes in the joints are not reversible, it is nevertheless possible for older individuals to benefit from exercise training, particularly if it is oriented toward promoting flexibility (Jirovec, 1991); strengthening the muscles that support the joints; increasing the circulation of blood to the joints, thereby promoting the repair of injured tissues (Brooks & Fahey, 1984); and decreasing risk of injury (Stamford, 1988).

#### CARDIOVASCULAR FUNCTIONING

Age-related changes in the heart and arteries have the effect of reducing the amount of blood available to the cells of the body, but under ordinary conditions, this is not particularly pronounced or noticeable. The effects of aging of the circulatory system are most apparent when the individual is engaging in aerobic exercise, when there is a reduction both in maximum oxygen consumption (aerobic capacity) and the maximum attainable heart rate (Lakatta, 1987; Morley & Reese, 1989). The decrease in maximum oxygen consumption occurs in a linear fashion throughout the adult years so that the average 65-year-old individual has 30% to 40% of the aerobic capacity of the young adult (McArdle, Katch, & Katch, 1991). Other functional variables that decrease to a commensurate degree include stroke volume (the amount of blood pumped at each beat of the heart) (Weisfeldt & Gerstenblith, 1986) and cardiac output per minute (heart rate times the stroke volume). As a result of these decreases in the functional capacity of the heart, less oxygen reaches the muscles during exercise, and the individual is more likely to suffer from temporary ischemia. These functional changes appear to be attributable to reduced pumping capacity of the heart due to a variety of changes affecting the structure and function of the heart muscle walls, particularly in the area of the left ventricle (Kitzman & Edwards, 1990; Weisfeldt & Gerstenblith, 1986). Changes in the heart and arteries can account, in part, for the observation that older individuals have higher levels of systolic and diastolic blood pressure, both at rest and during exercise; however, this is not a consistent finding and may be confounded by the presence of individuals with hypertension in the older populations that are tested (Whitbourne, 1986).



### *Psychological Interactions*

The adequacy of the cardiovascular system is reflected in the individual's ability to engage in a range of physical activities, including walking outside, moving about the house, carrying heavy objects, and engaging in strenuous exercise. Reductions in the cardiovascular system's functioning therefore contribute importantly to changes in the structures underlying movement to reduce, potentially, the individual's mobility in the physical environment. In addition, although not as apparent in its effects on identity as appearance, the functioning of the cardiovascular system is an important influence on the individual's feelings of well-being and identity. All adults know that the efficiency of the cardiovascular system is essential to life so that threats to the integrity of this system are perceived as highly dangerous. Awareness of reduced cardiovascular efficiency can therefore serve as reminders of one's own personal mortality.

### *Compensatory Mechanisms*

Given the importance of cardiovascular functioning to the overall health and longevity of the individual, there has been a wealth of research pointing to the effectiveness of exercise in slowing or reversing the effects of the aging process on the system (Stamford, 1988). Much of the original research in this area was conducted in Sweden, due to the popularity of endurance sports, such as cross-country skiing and long-distance running. Many of the participants in this early research were lifelong exercisers. With the growth of the fitness industry in the United States, however, contemporary research includes respondents with recent interest in aerobic exercise who may constitute a more representative group than do long-term fitness fanatics.

The major dependent variable in research on the effectiveness of exercise training is aerobic capacity and, secondarily, maximum attainable heart rate. The results of research on the effectiveness of exercise training have consistently revealed improved functioning in long-term endurance athletes, master athletes who remain active, long-term exercisers, and previously sedentary adults who enroll in short-term training programs (McArdle, Katch, & Katch, 1991; Whitbourne, 1986). The main advantage that exercise seems to hold as a means of retaining a higher level of cardiovascular functioning is that it provides a continued potent stimulus for the muscle cells of the heart to undergo strong contractions so that they retain or gain contractile power. The greater strength of the myocardial muscle improves the functioning of the left ventricle and as a result, more blood can be ejected from the left ventricle during the systolic phase of the cardiac cycle (Ehsani, Ogawa, Miller, Spina, & Jilka, 1991). The other advantage of exercise training is that it makes it