UNIT I

# MYTH: OLDER ADULTS LOSE PHYSICAL CAPABILITIES

In this unit, you'll learn about how the body naturally ages—inside and out—and how those physiological changes can impact us psychologically. Specifically, this unit will focus on the distinction between normative aging processes and those determined by disease. What's important here is that normative aging is not disease—though I think we all fear that they are one and the same.

Additionally, you'll see that aging does not equate to physiological downfall or nursing home residence. And aging does not automatically push you into the role of "burden." Independence is not always lost (in fact, this is rarely the case), and many older adults remain fully functioning for the majority of their days.

It's my hope that you see physiological changes as just that—changes. They are not burdensome or problematic. And just in the way we adjust to life as we move from adolescence to adulthood, we adjust to changes from adulthood to older adulthood. Gradually. And hopefully without fear.

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# 1 PHYSICAL AGING

## LEARNING OBJECTIVES

**1.1** Explain the normative age-related changes that occur in physical appearance, cellular aging, neurological aging, and hormonal aging.

**1.2** Describe the chronic disease and disability progression in osteoporosis, cardiovascular disease, and arthritis.

**1.3** Explain how quality of life is defined by ADLs and IADLs, disability, and the impact of the socioeconomic health gap.

**1.4** Describe the large array of settings for elder care, and how elder mistreatment might occur.

In the 1990s and early 2000s, if you fell asleep while watching TV and woke up in the middle of the night, it was not to a notice from Netflix asking you if you were still watching—Netflix didn't exist yet. Rather, you likely awoke to an infomercial (i.e., informational commercial lasting 30 minutes or more) for some "As Seen on TV" product that nobody actually needs. One of my favorites was a device designed to slim your neckline and remove sagging and aging skin from the bottom of your chin. It was a spring-loaded device you put under your chin, and you moved your chin up and down to squish it and "exercise" your double chin and sagging skin away. I wish I was kidding. This thing has stuck with me for all these years because of its ridiculousness, and how it perfectly epitomizes the lengths people will go to in order to avoid "aging." Now, as I write this, I see a headline in *Page Six* where "Kim Kardashian says she'd 'eat poop' daily if it made her look younger" (Zilio, 2022). I mean, you can't make this stuff up. If I thought the neckline slimmer was ridiculous, this claim is on a whole other level. But this is how extreme many in Western culture are with youth and the appearance of youth. What they aren't realizing is that physical aging is normal, and that the process of aging *is* beautiful. Changes to our appearance, body systems, cells, neurology, hormones, and other systems occur. That doesn't mean these fail us, and it doesn't mean we become ugly, disabled, or ineffective as humans. However, products like the neckline slimmer play into our fears and beliefs about aging and speak to the desperation that people feel to avoid the things they fear the most—and they don't even work. You can't exercise your chin skin away (is that really a sentence I just wrote?). In this chapter, we will address the normative changes that occur in our body with age, as well as what can happen when illness strikes and leads to disability. The chapter will also discuss nursing homes as just one alternative to senior living situations, and the risks and potential for elder abuse.

## NORMATIVE AGE-RELATED CHANGES

In discussing normative age-related physical changes in our bodies, it's important to recognize that *normative* means that these changes happen to many of us, and that these changes are not the result of disease. Most of the time, normative changes are minor and gradual, are not the same as disease, and do not impair daily functioning (Whitborne, 2002). This is an important distinction to make: Normative changes do not usually impair daily functioning, but disease-related changes can impair daily functioning dramatically. Let us first address some physical changes that occur in many of our body systems as the aging process progresses. Many of these changes are not noticeable at all, and others are only noticeable after they have progressed for many years. Changes can happen on a large scale, like in our height or weight, or on a small scale at a cellular level in our DNA.

### Physical Appearance

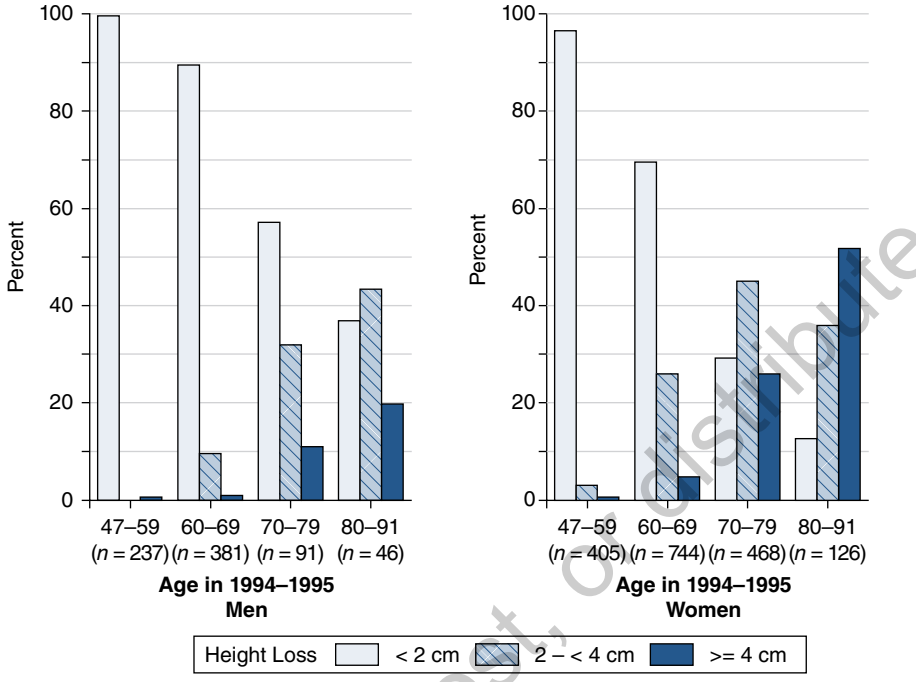
The first of these aging processes we'll discuss involves the changes that happen in our physical appearance. Unfortunately, in Western culture, with changes in physical appearance comes a very clear gender-based double standard (e.g., England & McClintock, 2009; Lauzen & Dozier,

2005). You are probably familiar with this bias. When women age, their *beauty is lost*. However, when men age, they appear *distinguished*. This is not only inconsistent messaging, but it clearly tells women that they are no longer desirable when they are older. This is **ageism**, plain and simple. Changes that occur in our bodies with age are similar across genders (though there are some differences by biological sex, as will be discussed in just a bit), but they are not perceived in a similar way. This perpetuates fear (e.g., McConatha et al., 2003) and can lead to behaviors intended to avoid the physical aging process (hello, neckline slimmer). But what are the normative changes that one can expect with age, and do they really cause such devastation in our physical appearance? No. Really they don't. But let's discuss what those specific changes are.

One of the most noticeable physical changes is our body weight. Typically, we see a pattern of weight change throughout adulthood that is an inverted *U* shape (Hutfless et al., 2013). That's to say that adults typically will gain weight slowly and steadily throughout adulthood until about age 60, and then weight begins to decline. For me, this is noticeable when my friends (now middle-aged) complain about having put on 15 or so pounds in the last 5–10 years. I tell them that it's normal, but they fight me on it, because this is not the predominant idea in Western culture. This isn't limited to either biological sex, but rather is related to changes in activity level (e.g., Di Pietro et al., 2004), nutrition needs and metabolism (Amarya et al., 2018; McCrory et al., 2002), and hormonal changes (more on hormonal changes in just a bit). Importantly, the weight changes that are normative in our aging process are small—approximately 10% of our body weight. Changes that are larger than this have been associated with disability (e.g., Busetto et al., 2009) and may be the result of other health and health behavior changes such as changes in thyroid function (e.g., Michalaki et al., 2006), lowered activity levels/desk jobs, and more.

Changes in height can occur as well (see Figure 1.1). Commonly, across the years of older adulthood, individuals can lose between one and two inches (or two to four centimeters) in height (Fernihough & McGovern, 2015)—this makes me wonder if I'll remain over five feet tall into my older years. There are biological sex differences here, where women tend to lose a bit more in height than men due to differences in how hormonal changes impact bone density. That is, postmenopausal women lose bone density at a higher rate due to shifts in estrogen levels (Frost, 1999). This bone density loss is normal; however, it can become abnormal if density gets too low. When bone density is sufficiently low, it results in osteopenia (i.e., small loss in bone density) or **osteoporosis** (i.e., larger loss in bone density that can cause irreparable damage and lead to injury, fracture, and/or disability). These are not normative aging, but rather disease, and are atypical in the general population. (We'll discuss this in more detail later in the chapter when we talk about chronic illness.) However, bone density is just one variable that impacts this loss in height; changes in musculature, posture, and simple gravity also play a role. Compression of the cartilage discs in between the vertebrae of the spine can contribute as well (Kimura et al., 2001). This compression impacts posture, and over time impacts an individual's height. Interestingly, I was speaking with an EMT recently, and she mentioned that when she asks patients their height, many older men respond with "I used to be" such and such height rather than their current height. She also specifically said that her observation was that only men tended to make these comments. So not only are they aware of this physiological change, but they are resistant to it as well—even in a medical situation.

**FIGURE 1.1 ■ Changes in Height With Age**




*Source*: Masunari, N., Fujiwara, S., Kasagi, F., Takahashi, I., Yamada, M., & Nakamura, T. (2012). Height loss starting in middle age predicts increased mortality in the elderly. *Journal of Bone and Mineral Research, 27*(1), 138–145.



While there are no published data that support this emotional toll, specifically of a decrease in height, this does make sense. And, research does show that older adults tend to overestimate their height (Cawley et al., 2017). Evolutionarily speaking, height and strength are associated with a man's traditional responsibility in hunting and protecting (Archer, 1996). To lose that is to lose one's evolutionary role, at least to some degree. Additionally, some research has connected the reduction in height to increased mortality, such that when height begins to decrease in middle age (rather than later in life), there is an increased risk of mortality by illnesses such as coronary heart disease, stroke, and respiratory illness (Masunari et al., 2012). To be sure, these data do not definitively dictate mortality via decreased height, but do signal that as a culture, we are not OK with the changes that occur with age, even if they don't mean anything in terms of our functioning or our well-being. And, if the changes signal anything regarding end of life, the fear of the change can become even greater.

In addition to changes in our height can be changes in our musculature. Muscle changes can contribute to our height changes, but some happen to our overall body composition. Commonly, as we get older, we experience some muscle loss. This muscle loss, called **sarcopenia**, is not initially dramatic, and it doesn't typically become noticeable until age 80 or older (Walston, 2012). Instead, it is a small, gradual change that can slowly impact our posture,

strength, and mobility. We may gradually become slower, less flexible, and less mobile over the course of 20 or 30 years. However, weakness that occurs suddenly is not normal and is not a part of the typical aging process, but rather may signal a disease process. Walston (2012) argues that normative changes in musculature are usually the result of changes in hormones, inflammation (see Chapter 10 for a further explanation of how inflammation impacts aging), activity levels, or neurological changes. They can certainly be exacerbated by disease and poor nutrition, which would make a loss of function more likely. However, maintaining function can be achieved through directed exercise and good nutrition (e.g., Timmerman et al., 2012).

Other changes in our physicality that we notice as we get older are in our skin and hair. They vary dramatically from one individual to another, but changes do occur. We may see wrinkling in the skin, skin dryness, lightening of the skin tone, and loss of elasticity and fullness in the skin (e.g., Farage et al., 2010). Our hair can become dry, change its texture, and stop producing its color (i.e., turn gray). These changes are normal and cannot be reversed or halted. However, this is not what the beauty industry wants you to think. *Try this cream, and your skin won't age. Try this shampoo, and your hair will be soft like a baby's.* While moisture is good and can help protect aging skin, neither of these products can stop or reverse the changes that occur with age. Moisture from a cream or a shampoo can minimize the look of some of the lines that we see in our skin and some of the brittleness that happens in our hair, but it will not address what is happening under the surface. Underneath the skin's surface, there is a breakdown in the collagen and structural layers within the skin. Because the top layer (i.e., the epidermis) is getting thinner, it becomes more susceptible to damage and is more likely to lose moisture (see Chapter 2 on how skin changes contribute to changes in our sense of touch). To be sure, there are loads of individual differences in how these changes occur, as they are influenced by a variety of factors, including genetics, sun exposure, diet, and smoking (e.g., Gupta & Gilchrest, 2005). And some research does support that supplementation with marine collagen can reduce the appearance of the skin wrinkling (e.g., Evans et al., 2021). Nevertheless, some change does happen eventually. And that's OK. It is normal and doesn't mean that the skin is unhealthy or that anything bad is going on. This is a reality that's hard for many to handle, because of the value placed on youth in Western culture.

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The value that youth is better and more attractive is not new. Studies dating back to the 1980s and 1990s have

demonstrated that not only do others value youth and equate youth to beauty (e.g., Koblenzer, 1996), but older adults also do the same about themselves (e.g., Graham & Kligman, 1985; Kligman & Koblenzer, 1997). Kligman and Koblenzer (1997) describe a cyclical effect that occurs when an older adult sees their "youth and beauty fade." If they interpret this as a negative experience, their willingness to continue to treat themselves well (make doctors' appointments, exercise, eat well, etc.) wanes. The poor treatment exacerbates the changes in their appearance, because now they aren't just aging; they may become unwell. They then see their appearance as even worse, and so the cycle continues. Rather, others who maintain self-esteem in the face of changing skin may better care for themselves. The difference here is a health concern as the result of differential psychological reactions to the physiological aging process.

So what exactly are the psychological implications of these physical changes? As we saw with the neckline slimmer and Kim Kardashian's claim that she'd "eat poop" if it kept her looking young, some individuals will take age-related changes in their appearance very seriously, which can negatively impact their body image (Becker et al., 2013). And some resort to extreme, ridiculous, or ineffective behaviors in their pursuit of maintaining youth. This is reasonable given the avoidance and negative social interactions that come in our society when one is deemed unattractive (e.g., Gupta & Gilchrest, 2005; Gupta & Gupta, 2003). One study even demonstrated that caregivers in a nursing home and a hospital were less nurturing toward patients who were visibly older or unattractive in some way (e.g., Gupta & Gupta, 2003). It is awful to be treated this way based on one's appearance, especially in a setting where you need care—but then again, all humans need care. And the potential for neglect and lack of support makes the reaction to avoid looking older or unattractive understandable to some degree. Who would want to be avoided and deprived of nurturing? The implications of a lowered quality of life because of one's appearance include symptoms of depression and anxiety and lowered self-esteem and are a very real outcome for many (e.g., Farage et al., 2010).

As someone who knows that being older doesn't equate to being unattractive, I find this a hard pill to swallow. These acts of "grasping at straws" to remain young seem sad and unnecessary but may be indicative of a culture shift that is needed in our Western world. This is not to say that doing anything cosmetically is bad. There is nothing inherently bad about changing your hair color, putting on face cream, or getting plastic surgery. However, the reasons for engaging in these behaviors are important. Are we putting on face cream because it makes us feel good, or are we putting it on in an attempt to prevent aging? Are we coloring our hair because we like the way we look with brown hair instead of gray? Or are we coloring it because gray hair means we're getting older and we feel we need to hide that? Are we doing it to gain and/or maintain social acceptance? This is an important distinction to make, and one that can give insight into our own beliefs about physical aging.

## Cellular Aging

While we may see changes to our appearance—height, weight, hair color, wrinkled skin, and so on—easily with our eyes, there are aging processes happening below the surface on a cellular level that are not visible to our naked, human eye. Rather, changes happen to our cells and our DNA over time and with exposure to stressors in our environment (e.g., Epel et al., 2004; Lin et

al., 2012; see Chapter 10 for more information on how stress affects our cells). With normative aging, cells can be impacted in two ways: through oxidation and/or through limitations in cell division. We will discuss the impact of each of these here.

First, cellular **oxidation** is a process by which cells can be damaged through use and exposure to **free radicals** in our environment. Oxidation is not damage by disease, but rather just something that happens by use over time. I like to think about the oxidation process like rusting (because the process is chemically very similar to what happens when metal rusts). No matter our environment, simply living exposes us to free radicals—that is, substances that are missing electrons in their outer atomic layer. When these free radicals come upon our cells and see available electrons, they take them to complete their outer atomic layer and become more stable. While sharing is good in human relationships, this type of sharing is not. When our cells give up their electrons, they become unstable and can no longer survive. The cell dies (it essentially becomes rust), and its leftover bits get absorbed into the surrounding cells. This is a normal process, but if it happens too much or too often, cells cannot regenerate fast enough. The good news is that **antioxidants** can help slow down this oxidative process. Antioxidants, found in foods rich in color like espresso, berries, cloves, and kale (e.g., Carlsen et al., 2010), can intercept the free radicals before they take electrons from our cells. Instead, they provide the electrons (rather than allowing them to be stolen from our body's cells) and keep the free radicals' attack at bay. They won't stop the oxidation process from happening but can minimize its impact—that is, less rust. And while the full mechanism behind oxidation is more complex than this, involving enzymatic activity, internal oxidation, and the influence of stress (e.g., Cutler & Rodriguez, 2003), a large amount of data suggests that oxidation is at least part of the mechanism behind the cellular aging process (e.g., Kuznik et al., 2022). This is one reason why eating foods rich in antioxidants can be beneficial (e.g., Beckman & Ames, 1998; Liguori et al., 2018; see Table 1.1), although some research demonstrates that we can also produce some of our own antioxidants naturally (e.g., Junqueira et al., 2004).

**TABLE 1.1 ■ Foods With High Antioxidant Value**

| Fruits | Vegetables | Beverages | Herbs and Spices |
|---|---|---|---|
| Indian Gooseberry | Curly Kale | Espresso | Clove |
| Plums | Okra | Black Coffee | Cinnamon |
| Blueberries | Broccoli | Red Wine | Mint |
| Dates | Black Olives | Pomegranate Juice | Nutmeg |
| Mango | Artichoke | Green Tea | Ginger |
| Apricots | Red and Green Chili | Grape Juice | Rosemary |
| Strawberries | Pecans | Black Tea | Sage |

*Source*: Carlsen, M. H., Halvorsen, B. L., Holte, K., Bøhn, S. K., Dragland, S., Sampson, L., Willey, C., Senoo, H., Umezono, Y., Sanada, C., Barikmo, I., Berhe, N., Willett, W. C., Phillips, K. M., Jacobs, D. R., Jr., & Blomhoff, R. (2010). The total antioxidant content of more than 3100 foods, beverages, spices, herbs and supplements used worldwide. *Nutrition Journal, 9*(3), 1–11.

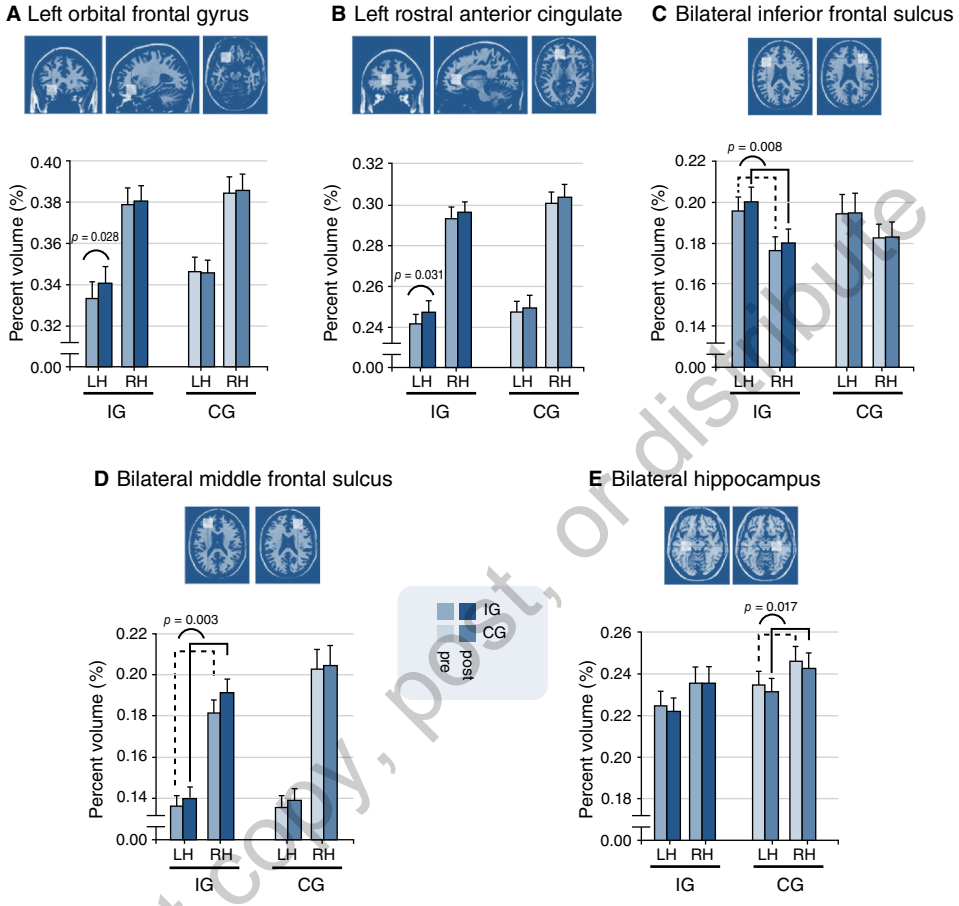
Another process that inherently determines aging at a cellular level occurs in our cells' division process. All throughout our lives, our body's cells replicate and replace themselves to keep things fresh; however, there are limits to how many times each cell can do this. This idea is not new—clues of scientists' suspicions that cells cannot replicate indefinitely date back to the late 1800s. However, Leonard Hayflick determined these limitations to be centered on the ends of the cells' DNA in the mid-1900s (e.g., Hayflick, 1968). These ends, called **telomeres**, shorten each time a cell divides. And, like ripping paper in half to get two pieces, the telomeres can only shorten so many times before the cell cannot be "ripped in half" again. This limit has been termed the **Hayflick limit** (Burnet, 1974), and while the limit is different for different types of cells, it defines that the cell can only divide so many times before it will no longer replicate. This means that there is an inherent end to cell replication. Like oxidation, the shortening of the telomeres eventually results in cell death and can be accelerated by stress (e.g., Lin et al., 2012; see Chapter 10 for more details on the impact of stress on telomeres). However, the Hayflick limit indicates that cell division (and replacement) progresses for much of our lives. This refreshment of cells is positive, even if we can't do it indefinitely (this isn't *Fame*, and we aren't going to live forever). To be sure, there are cells whose telomeres maintain their length—through enzymatic activity of telomerase—but these cells are cancerous and grow and divide with no boundaries, constraints, or limits (e.g., Olovnikov, 1996). Those are not the cells any of us really want to have around.

## Neurological Changes

Cellular changes don't just happen in the cells of our skin or internal organs; they also happen to our neurons. These neurological changes can have implications for our speed of cognitive processing, memory, and executive function (see Chapters 3 and 4 for more details on the changes in those processes; and here's a preview: they aren't all bad). Importantly, in normative aging processes, neurological changes are mild, slow, and general (e.g., Burke & Barnes, 2006). This is different from changes that occur as the result of disease processes, where changes are faster, more specific, and usually more dramatic overall. Changes in neurons can happen through growth or through **pruning** (i.e., eliminating) in the neural networks of the brain. Yes, I said *growth*. Our neural networks change and grow each time we learn something, creating new neural connections (e.g., von Bernhardi et al., 2017). These connections form for anyone at any age. While it may take more time to change the network and grow a new connection, an older adult can learn new tricks and create new connections (Burke & Barnes, 2006). Alternatively, pruning unused or unnecessary neural connections happens as well (Craik & Bialystock, 2006). Use it or lose it, I always say. And it's true. If you don't need a connection and haven't used it in a long time, there's no sense in using energy to maintain it. Humans maintain **neural plasticity** and adjust and change their neural networks into older adulthood (e.g., Disterhoft & Oh, 2006).

Research here supports these ideas. In one study, Soshi et al. (2021) investigated factors that contributed to neural plasticity in older adults' frontal lobes, and its relation to memory function. Here, older adults were assigned to an aerobic exercise intervention and compared to their age-matched controls not engaging in the exercise program. Brain scans indicated growth in the frontal cortex and hippocampus of older adults in the exercise intervention group, suggesting that the exercise was a mitigating factor in encouraging new neuronal growth (see Figure 1.2).

**FIGURE 1.2 ■ Changes to the Frontal Cortex and Hippocampus, Resulting From Physical Exercise**




*Source*: Soshi, T., Andersson, M., Kawagoe, T., Nishiguchi, S., Yamada, M., Otsuka, Y., Nakai, R., Abe, N., Aslah, A., Igasaki, T., & Sekiyama, K. (2021). Prefrontal plasticity after a 3-month exercise intervention in older adults relates to enhanced cognitive performance. *Cerebral Cortex, 31*(10), 4501–4517.

Importantly, the increased brain volume in these areas was also associated with improved performance on working memory tasks, indicating that the growth in neural connections was leading to enhanced cognitive functioning for this group of older adults. The same was not true for individuals who were not in the exercise intervention group. These results are supportive not only that neural plasticity is possible in older adulthood, but also that physical movement is a facilitator of that benefit. And since exercise can help our bodies as well, it can feed two birds with one grain.

Other research has examined brain structures in the oldest old (i.e., adults over 85), and how changes here may mimic some of those seen as the result of disease processes (e.g., Balasubramanian et al., 2012). While this may be seen as negative, and some try to use this as

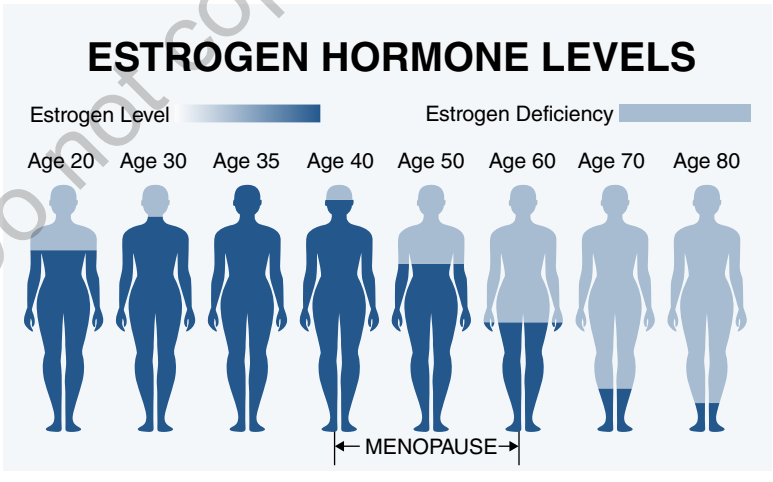
evidence that we will all just get Alzheimer's eventually anyway, this is absolutely not the case. Some normative neurological changes, however, do overlap with changes seen in Alzheimer's disease. Specifically, Balasubramanian et al. (2012) showed neuritic plaques in the oldest old who did and others who did not meet the criteria for Alzheimer's disease. However, these changes did not preclude individuals from learning. The difference (discussed in further detail in Chapter 8) for individuals with Alzheimer's disease is that the neuritic plaques and neurofibrillary tangles (i.e., neurological changes) occur at a younger age, are more widespread, develop at a more rapid pace, and result in impaired functioning. While Balasubramanian et al. demonstrated that some neurological changes occur even for those who do not have Alzheimer's disease, change over time is normal. A brain of a 70-year-old shouldn't be the same as one of a 25-year-old. These are different people with different experiences, knowledge, motivations, relationships, and so on, and these differences are reflected in the physiology of the brain.

## Hormonal Changes

Physiological changes occur to our hormonal and reproductive systems as well. The most well-known such change is menopause, but this is not the only change that occurs. Changes occur before, during, and after menopause. And, changes occur for both biological men and biological women (e.g., Horstman et al., 2012)—though biological men do not have the obvious demarcation from fertile/able to bear children to not fertile. Let us examine the hormonal shifts as biological and evolutionary mechanisms.

Shifts in hormones for biological women occur throughout adulthood, with drops in estrogen and changes to the menstrual cycle occurring as early as one's 30s (e.g., Bachmann, 1994; Dunson et al., 2002; see Figure 1.3). This begins the changes that will eventually impact fertility

**FIGURE 1.3 ■ Changes in Estrogen Levels With Age**




*Source*: USF Health Diabetes and Endocrinology Center. (n.d.). *Menopause and post-menopausal hormone therapy.* https://health.usf.edu/care/diabetes-endocrinology/services-specialties/hormone

through "the change" during menopause. The shifts in estrogen levels can result in changes in bone density and, without proper nutrition (and with the right—ahem, wrong—combination of genetics and environmental factors), can result in osteopenia or osteoporosis (e.g., Horstman et al., 2012). But more on that in just a bit.

Shifting from one who can bear children to one who can't, evolutionarily, is crucial for the survival of those young. It's important that the one who bears and rears those children is strong and able to do those jobs, and that their hormonal health supports the bones that are needed to do that job. That is different from the biological male, who needs to spread his DNA far and wide to perpetuate the species (e.g., Birkhead, 2000)—no matter the current status of his strength or youth. Evolutionarily speaking, he would not be bearing or rearing the children anyway. The result here is that while, biologically, men do experience some changes to their hormones that lower their sperm count (e.g., decreases in testosterone; Wang & Stocco, 2005), this does not stop them from continuing to reproduce.

If we look closely at the differentiation here between biological women and men, it's clear that fertility and reproduction are important. For women, youth is the time of fertility. This evolutionary predisposition may be the impetus for valuing youth in women but not in men—although we now know that this not the only value women provide. In more modern life, the social roles have evolved (we'll discuss social roles later in this book), and thus the perspective on menopause as the end to female reproduction is a bit different; however, the negativity surrounding it often remains. For example, Kelly (2011) argues that menopause is viewed by many as a demarcation between a "normal appearing" woman and one who acts overemotional and unsteady—and that life postmenopause is viewed as having nothing to look forward to. This delineation could make sense in the evolutionary view that life is to create more life. However, modernity and cultural changes show that there is more to life than making more life. And this textbook shows that there is plenty to look forward to postmenopause. So, I would argue that the claim of normal/not normal à la Kelly isn't a fair or legitimate point to make; we just need to spread the word.

Shifts in hormones impact other body systems, including sleep, protein metabolism, and muscle mass, as well as cognitive function and mood (e.g., Horstman et al., 2012). For instance, changes in hormones can interfere with temperature regulation mechanisms, making individuals feel hot when there is no heat around (i.e., hot flashes). I remember one such instance with my mother where she was so uncomfortable, she just sat under the ceiling fan and cried in frustration. If this is the "unsteadiness" Kelly (2011) was referring to, I can understand (though these claims should be situational and not dispositional; but more on those in our discussion on social cognition in Chapter 7). Who would be rational or pleasant when they are so uncomfortable? Additionally, Horstman et al. (2012) explain that these changes can lead to a low level of inflammation in the body, leaving the older adult more susceptible to autoimmune diseases, cancer, diabetes, and cardiovascular disease. While not part of the normative aging process, an increased risk of these disease processes exists and should prompt an individual for regular check-ins with their doctor to ensure any disease is detected early and treated properly (Pradhan et al., 2002). We'll discuss the specifics of some of these diseases next.

## CHRONIC DISEASE

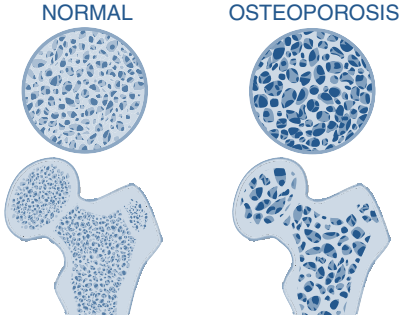
When aging processes don't go as expected, are accelerated, or impact our functioning, they are often the result of disease, rather than normative aging. This is an important distinction. Aging does not equate to disease. Ever. In this section, we'll discuss some common (though still not normal) chronic disease processes that may impact functioning in older adulthood. These diseases may be ones you've heard of, witnessed, and maybe thought to be normal in aging. I assure you they are not.

The first of these diseases was mentioned earlier in this chapter: osteoporosis. Osteoporosis is a condition where bones have lost so much of their density that they become brittle, putting the individual at a high risk for fracture and injury (see Figure 1.4).

This condition is more common among women than among men (and more common among white individuals than Black); rates reported by Sozen and colleagues (2017) are that one in three women and one in five men will be affected. Additionally, increased risk falls on those with family history of osteoporosis. Fortunately, these rates do not indicate that everyone will develop osteoporosis, nor do they indicate that everyone diagnosed will lose function in their day-to-day lives. Most individuals with osteoporosis live normally, with regular bone density scans to monitor progression (e.g., Silverman, 2005). Additional precautions should be taken to minimize the risk of falls around the home (better lighting, no loose cords or rugs, demarcation at the edges of stairs, etc.), and in some cases, medication can be prescribed to slow the progression of the disease as well (e.g., Solomon et al., 2005). However, dietary calcium sources (milk, yogurt, broccoli, kale, etc.), as well as weight-bearing exercise (pushups, bicep curls, etc.), can help prevent onset and progression in some individuals (e.g., Schmiege et al., 2007; Shanb & Youssef, 2014).

Cardiovascular disease (i.e., heart disease) is another common occurrence in older adulthood, encompassing atherosclerosis, cardiac arrest, coronary artery disease, high blood pressure, and more (Halter et al., 2014). To be sure, these are scary to think about for many of us, but it bears repeating—these are not a guarantee in older adulthood. However, many older individuals live with high blood pressure (often controlled with diet, exercise, and/or medication) or are at risk of cardiac arrest. Interestingly, although cardiovascular disease is the leading cause of death in both men and women (e.g., Mosca et al., 2011), the absolute numbers of women have surpassed the

**FIGURE 1.4 ■ Comparison of Osteoporotic Bone to Healthy Bone Tissue**




*Source*: iStockPhoto/Bigmouse108.

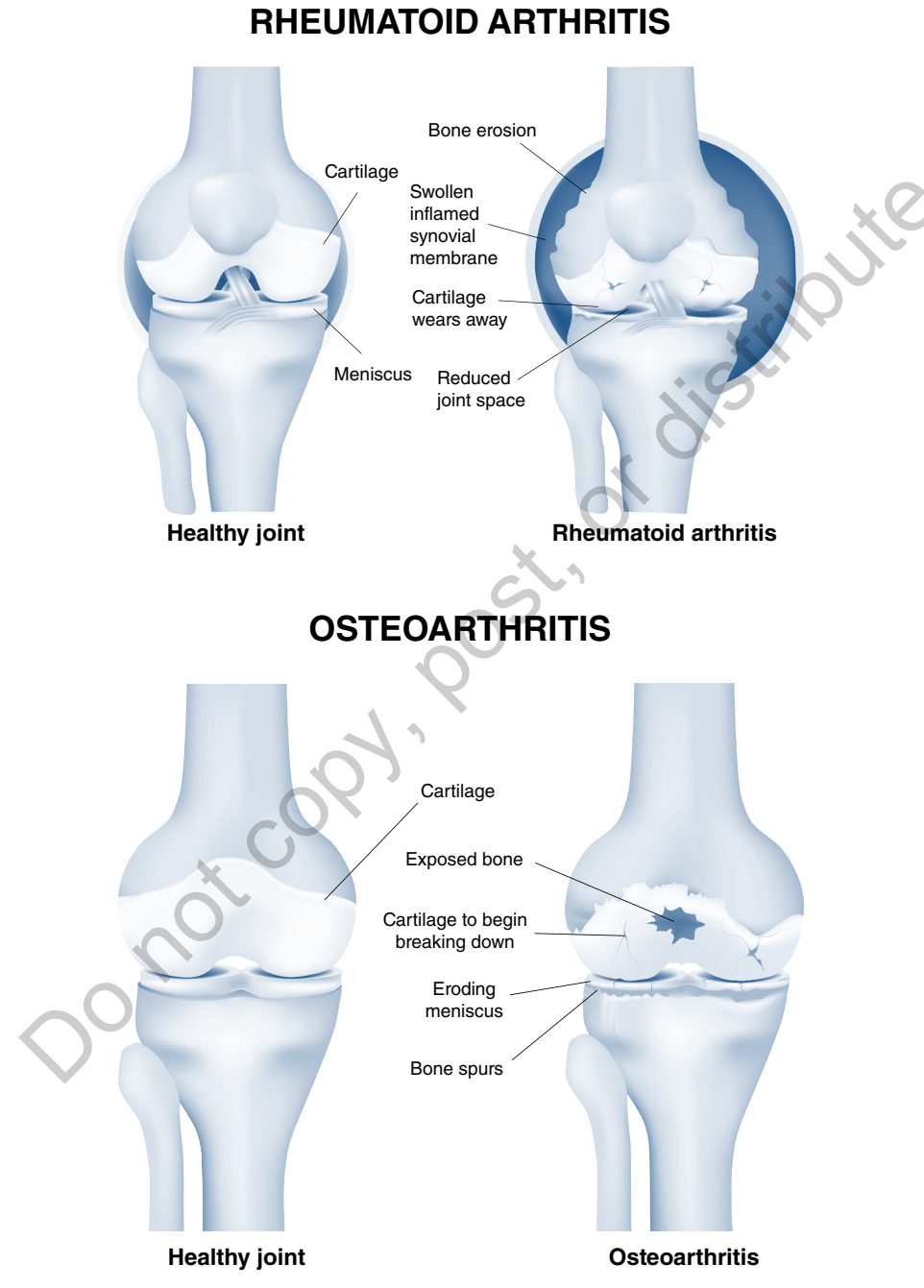
numbers of men dying from cardiovascular and related diseases since the mid-1980s. One reason for this discrepancy has to do with awareness of the differential symptom displays. I suspect that, like most people, you relate heart disease and cardiac arrest symptoms to chest pain, shortness of breath, and shooting pain in the left arm. While you are correct, those are the typical symptoms displayed by men (see the American Heart Association for more information). Women, on the other hand, tend to show different symptoms—which seem to be more consistent with "just not feeling well." Women often report feelings of nausea, fatigue, upper back pain, and malaise. Not identifying these symptoms early can end in catastrophic results. Spreading awareness of these symptoms has been a goal of the American Heart Association's Go Red for Women initiative, in the hopes of reducing these rates and improving women's heart health outcomes.

A third common illness in older adulthood that we'll address here (though there are certainly others) is arthritis (see Figure 1.5). Importantly, we'll distinguish between **osteoarthritis** and **rheumatoid arthritis** and the functional outcomes of each (see the Arthritis Foundation for detailed information about the many different types of arthritis—there are over 100!). Osteoarthritis is known as "wear-and-tear" arthritis. That is, it is a type of arthritis resulting from using a joint over a long period of time. That exceptional use can result in the wear-down of the cartilage in the joint, resulting in pain when the bones rub against one another without the cushion that was once provided by the cartilage. This is different from rheumatoid arthritis, which is an autoimmune disease that results from an inappropriate immune response. In rheumatoid arthritis, one's immune system mistakes joints and their surrounding synovial fluid for foreign bodies and attacks them, creating inflammation of the joint and breakdown of the bones themselves (e.g., Majithia & Geraci, 2007).

As you would expect, using joints over a lifetime could put one at a higher risk of developing osteoarthritis. This long-term use, often stemming from one's occupational choice (e.g., Cooper, 1995), along with any additional wear and tear that can come from injury, high-impact sports or running (e.g., Lane et al., 1993), and so on, can increase these risks. However, risks of osteoarthritis are mechanical, and are fundamentally different from risks associated with rheumatoid arthritis. Here, risks include genetic factors (i.e., a family history of rheumatoid arthritis and/or other autoimmune disorders), as well as other factors like exposure to tobacco smoke and female biological sex (e.g., Bax et al., 2011; Deane et al., 2017). Additional considerations for the development of rheumatoid arthritis come from changes in the immune system that are associated with aging. Here, immune changes can include shifts in the distribution of T-cells, B-cells, lymphocytes, neutrophils, and so on (e.g., Fali et al., 2018), as well as an increase in pro-inflammatory cytokines, like tumor necrosis factor (TNF) or c-reactive protein (CRP; Franceschi & Campisi, 2014). These changes can make an immune attack against oneself more likely—though young people do also experience rheumatoid arthritis and other autoimmune diseases (e.g., Horiuchi et al., 2017), so this is not definitive.

Both instances of arthritis can impact an individual's functioning over time, but the likelihood of more pain and diminished functioning is higher in rheumatoid arthritis than in osteoarthritis (e.g., Affleck et al., 1999), given that this is a systemic issue rather than one isolated to a couple of joints that have been worn down over time. Therefore, we should consider a saying that I heard from a woman in one of the group fitness classes I taught years ago. She told me, "Motion is lotion." She speaks truth! Research on exercise has demonstrated that gentle,

**FIGURE 1.5 ■ Comparison of Osteoarthritis and Rheumatoid Arthritis With a Healthy Joint**




*Source:* iStockPhoto/ttsz

consistent activity is helpful in reducing pain in osteoarthritis (e.g., Fransen et al., 2015) and maintaining range of motion and muscle strength in the muscles that support the joints in rheumatoid arthritis (e.g., Cooney et al., 2011).

At this point, you may be wondering: Why discuss these health concerns in a book about psychology? My answer to you is because it's all connected. These health concerns specifically impact our fears about getting older as well as our functioning and well-being as older adults. And, some research shows that any tendency to catastrophize (i.e., think badly about) conditions like arthritis can increase the struggle with these diseases (e.g., Edwards et al., 2006). Functioning (discussed next in terms of quality of life and disability), and our ability to continue to lead independent lives, is important to leading a good life in older adulthood.

## ADL PROBLEMS AND DISABILITY

In relation to disease, we will discuss the impact that these diseases have on our **quality of life (QoL)** and any functional limitations that can impact our ability to lead our daily lives. Exploring these issues is important for a health care practitioner to be able to identify the extent to which an individual is impacted by their specific health concerns. For example, someone newly diagnosed with rheumatoid arthritis may have no issue cooking meals or dressing themselves, but as the disease progresses, they may start to notice that opening jars or buttoning a shirt becomes difficult. And, while these specific examples are easy to accommodate with jar openers and shirts without buttons, some functional limitations can lead to difficulties in day-to-day tasks and independent living (e.g., climbing in and out of a bathtub or up and down stairs).

Measures that are often used in determining the extent to which an individual is impacted by disease are the **activities of daily living (ADLs)** and **instrumental activities of daily living (IADLs)**. Measuring ADLs and IADLs through both observation and self-report can help a practitioner determine how effectively an individual can carry out activities of daily life (e.g., Elsawy & Higgins, 2011; see Table 1.2).

**TABLE 1.2 ■ Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs)**

| Activities of Daily Living (ADLs) | Instrumental Activities of Daily Living (IADLs) |
|---|---|
| Bathing/showering | Transportation |
| Toileting | Preparing food |
| Continence | Managing/taking medications |
| Dressing | Paying bills |
| Feeding | Communicating with others |
| Ambulating | Mental support and relationships |

*Source*: Adapted from Zallio, M., McGrory, J., Berry, D. (2020). How to Democratize Internet of Things Devices: A Participatory Design Study to Improve Digital Literacy. In: Di Bucchianico, G., Shin, C., Shim, S., Fukuda, S., Montagna, G., Carvalho, C. (eds) Advances in Industrial Design. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1202. Springer, Cham. https://doi.org/10.1007/978-3-030-51194-4_18

For example, ADLs are activities that address basic needs, including things like feeding oneself, dressing, bathing, and toileting. Alternatively, IADLs include activities that allow an individual to live independently, such as paying bills, doing laundry, and cooking meals. These activities can be impacted by any one of several disease processes (stroke, arthritis, Alzheimer's disease, etc.), but are not negatively impacted by normative aging itself (e.g., Baltes & Smith, 2003). A healthy older adult should be able to accomplish their ADLs and IADLs with little trouble, even if the tasks are completed more slowly than they were in young adulthood. These measures are important in identifying early functional impairment, which can allow for early intervention (e.g., Brach et al., 2002). However, early intervention isn't always an easy feat. In a study by Brach et al. (2002), a group of older adults was measured on their ADLs and IADLs, as well as their perception of their own daily functioning. The comparison of perception and actual functioning demonstrated that these individuals were less aware of declines that were just beginning and were therefore less likely to report difficulties to their health care providers. That is, they reported tip-top functioning, though their IADLs were less than stellar. And, unfortunately, a delay in reporting any difficulties in functioning could mean the difference between timely intervention and more severe functional decline/lowered QoL. Moreover, if a goal of our older adult years (even within the context of disease) is to maintain independence, then accurate assessment and functional intervention is necessary earlier rather than later.

In instances where functional decline becomes too great, and difficulty in carrying out ADLs and IADLs is too large, the result is **disability** (Colón-Emeric et al., 2013)—that is, substantial limitation in at least one major life activity (see the Americans with Disabilities Act [ADA] for more information). Disability is not a death sentence, nor is it an indicator that one needs to resort to living in a communal living space or nursing home (more on that later). Rather, it is an indication that support is needed (e.g., Wilson et al., 2009). The type of support can be small, such as a meal delivery service rather than cooking one's own meals, or large, like having a home health aide come a few times a week to help with bathing. These supports can allow for better overall well-being (e.g., Murphy et al., 2009)—a factor that contributes to QoL.

While QoL is potentially different for everyone, there are some commonalities. A good QoL usually constitutes things like social and emotional health, physical well-being, life satisfaction, and happiness (e.g., Power et al., 1999). These components are arguably universal across individuals and across cultures, and because they are so pervasive, it seems logical to assume that we'll want to find ways to maintain and/or improve them for all. Drewnowski and Evans (2001) explored this idea through the relationship between physical activity, nutrition, and QoL. They argued that the impact of physical activity and nutrition on QoL is just as important as their impact on physical health measures, such as blood pressure and muscle strength. Additionally, a sense of personal control over dietary choices (and perhaps being able to cook them oneself, if that is something they enjoy), as well as enjoyment of physical activity, is important. This makes sense—we won't carry on eating or doing anything that we don't want to do for very long. Anecdotally, I can tell you that when older adults love their exercise, they will carry on for years and years. When I was a group fitness instructor, attendees of my classes were primarily women over 60. These women loved our classes and had been taking them for upwards of 20 years. In the class, they found physical activity, as well as positivity and friendships—contributing to

social and emotional well-being and a good QoL. However, the extent to which an older adult's physical activity benefits their QoL is at least partly due to what they view as the importance of that physical activity (e.g., Stewart & King, 1991). That is, Stewart and King (1991) showed that physical activity is most impactful on the factor that is of most concern for the individual. If the older adult is already doing well physically/health-wise, then their perception of the impact of physical activity may be primarily on cognitive and socioemotional well-being. However, when health-related factors are of higher concern, those are the factors to receive the perceived benefit. Regardless, the QoL benefit is clear.

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## Disability and Compression of Morbidity

With functional changes seen in common disease processes in older adults (remember these are not a guarantee but are more likely to occur in our later years), there is also an increased likelihood of disability (e.g., Gill et al., 2006; Quiñones et al., 2016). However, the longer an older adult can stave off that decline in functioning, the less time one will spend in poor health. This **compression of morbidity** is the result not only of advances in health care that extend our life expectancy, but also of health care improving overall health at a higher rate than the extension of life expectancy (mostly due to the treatment and eradication of highly contagious diseases, like polio and tuberculosis; e.g., Chatterji et al., 2015; Fries, 2003). However, we should consider the difference between life expectancy and healthy life expectancy—with that difference largely due to the QoL during the time when one deals with illness and/or disability. Chatterji et al. (2015) suggest that health treatments and interventions have usually been aimed at fatal diseases, leaving other diseases to remain. While this is positive in the sense that we'd be keeping an

individual from dying from a specific disease, it also means that when that individual has more than one illness (e.g., heart disease *and* arthritis), the other disease remains and can become the source of functional limitations. Therefore, lifestyle changes become increasingly important to maintain QoL and healthy life expectancy. For example, if treatment focuses on an individual's heart disease and cardiovascular function, that is fantastic. But their arthritis may not be treated with the same gusto, because arthritis is not fatal. This individual could then face limitations in mobility and difficulties opening jars and chopping vegetables (i.e., making nutritious meals). Not only would these limitations lower their ability to carry on with activities they once loved, reducing their QoL, but they also could backfire and impact the individual's heart disease—as would be the case in preparing nutritious meals. Ideally, then, treatment would focus more holistically on the entire well-being of the individual, rather than just the things that could lead to the end of life. Unfortunately, we aren't there yet.

### Socioeconomic Health Gap

Interestingly, compression of morbidity seems to be specific to countries with higher incomes—though data from lower-income countries are scant (see Chatterji et al., 2015). However, the data that do exist suggest that developing countries see more poverty and insufficient access to proper health care. Compound those issues over a lifetime, and we get a scenario where disability in old age is more likely (Chatterji et al., 2015). Therefore, developing countries tend to report an expansion of morbidity (i.e., a larger amount of time spent ill or disabled before the end of life), rather than a compression of morbidity that we see in more developed countries (of course, this may change as we move forward into post-COVID-19 life). This distinction is just one example of the health discrepancies between individuals of different socioeconomic status, but there are certainly others.

## ELDER CARE

With the concerns of the possibilities of functional limitations in older adulthood, in cases where illness strikes, the issue of continuing independent living becomes a very real question. For many, needing assistance for daily life is a very scary idea, especially for those in Western culture, as we place high value on our independence (e.g., Plath, 2008). Needing assistance is also difficult for us because of the way we see popular culture/media portray one of the few options of older adulthood—a nursing home—in a very negative light. If you remember the 1980s–1990s sitcom *The Golden Girls* (Harris et al., 1985–1992), two of the four women were a mother-daughter duo: Dorothy and Sophia. Dorothy jokingly threatens her mother, Sophia, with sending her to a nursing home each time Sophia annoys her. She says "Shady Pines, Ma," as if this nursing home is the worst of the worst places to be and Dorothy would leave her there to be neglected until she dies. While meant in a comedic context (and very sarcastic—definitely my love language), this is a fairly real fear embedded in how Western culture views older adulthood: When we get older, we either live with our child, or, if they don't want us, we go to "a home." However, this is far from the truth. There are many living options during older adulthood, including independent living. And nursing homes are usually reserved for those who need actual nursing care. From nurses.

Moviestore Collection Ltd/Alamy Stock Photo

Living options for older adulthood include independent living in one's own home, living with an adult child, retirement communities, assisted living, and skilled nursing facilities (e.g., Glaser, 1997; Tomassini et al., 2004)—though these options and the preferences for these options seem to be somewhat culture and income dependent (e.g., J. R. Beard & Bloom, 2015; Edmonds et al., 2005; Kamo & Zhou, 1994). These options are in gradation of care, from independently living in the home one always has lived in to living in a dorm-like facility with around-the-clock nursing care, and everything in between. For example, many older adults choose to live in retirement communities. These are ordinary neighborhoods whose residents are all over 60 (sometimes over 50). Here, residents need to do no upkeep on their property, but have all the independence they have always had. The difference is that their community is comprised of individuals like them, and the physical work of mowing the lawn, tending to the swimming pool, and so on is no longer their responsibility. Additionally, many of these communities have a clubhouse or community center, where activities are available for the residents, making community connections easier and allowing for older adults to stay active and engaged.

When an individual needs a bit more than just someone to take over the lawn and outdoor maintenance of their home, assisted living is helpful. Here, an older adult usually lives in an apartment-style community, where services are available as needed. These services range from light cleaning or meal prep to assistance with all IADLs. Usually, nursing care is not provided in an assisted living facility, but sometimes individuals can have home health aides come help with bathing and such a few times per week. However, when more medical assistance is needed and a nurse would be ideal, a nursing home is the place to be. Here, medical care and real licensed practical nurses (LPNs) and registered nurses (RNs) are available to administer medications, check vital signs, communicate with doctors, and so on (e.g., Bedin et al., 2013). In a nursing home, individuals also benefit from the same services that other living arrangements

do—meals, cleaning, and help with bathing and other IADLs and ADLs. It is important that we understand that the fact someone is in a nursing home doesn't mean they aren't able to do *anything*. Rather, they need medical care that can't be administered in their home, or they have a medical condition that makes it unsafe for them to be alone in their home (Sherwin & Winsby, 2011). Importantly, Sherwin and Winsby (2011) explain that a nursing home *isn't* a complete loss of autonomy—this is an important distinction for patients, families, and nurses to understand. Allowing for considerations for what an individual *can* do, as part of their medical condition, cognitive capabilities, and social and emotional functioning, should be a top priority. Allowing for autonomy for the nursing home patient is important in their willingness to be there and their QoL overall (van Thiel & van Delden, 2001).

Along with loss of independence, admission to nursing homes is a specific point of fear for older adults (e.g., Quine & Morrell, 2007), though most older adults will not need to live in a nursing home. One of the factors that plays into this fear is the media's portrayal of nursing homes and the news stories we hear about horrible things happening in nursing homes (e.g., H. Beard & Payne, 2005)—including elder abuse and neglect. While vivid and scary, the instances of elder abuse we hear about in nursing homes are not the norm. Nor is elder abuse confined to nursing homes. We'll discuss this issue next.

## Elder Mistreatment

Like any other group of people, older adults can be subject to abuse—physical abuse, psychological abuse, emotional abuse, sexual abuse, financial abuse, and even neglect. While not universal, or even very common, elder mistreatment (EM) happens enough to be of concern. The World Health Organization (WHO, 2015) reports rates between 2% and 14% worldwide. However, as you may suspect, it is very likely that these estimates are lower than what actually occurs because instances of abuse are often not reported due to their sensitive and/or personal nature. For instance, a victim may be reluctant to report financial abuse because their abuser was their adult child who took money out of entitlement (e.g., Bagshaw et al., 2013). Alternatively, the abuser may hold power over the older adult, as in the case of a caregiver—either at home or in a nursing home. Or, perhaps the older adult is married to the abuser, the individual is emotionally abusive, and they do not recognize it or classify it as abuse. All these scenarios and more can prevent reporting and/or recognition of EM (e.g., Schmeidel et al., 2012).

But, if this happens at least as often as is reported, what are the factors that put an individual at risk for abuse or abusive situations? And can we do something to intervene? Joosten and colleagues (2017) tell us that poor physical and mental health, functional dependence, cognitive impairment, or disability increase the risk of EM. Additionally, Johanneson and LoGiudice (2013) suggest that when caregiver stress and strained familial relationships are thrown into the mix, the risk gets higher. The New York State Elder Abuse Prevalence Study (Lachs & Berman, 2011) showed that individuals living in urban areas were up to 50% more likely to be victims of abuse, in any form. That said, there are some interventions that have been demonstrated to be effective, including Enhanced Multidisciplinary Teams (E-MDTs). These teams are comprised of accountants, lawyers, mental health providers, and law enforcement. This multifaceted approach allows for any type of abuse to be handled and provides support for the victim

at the same time (Morano & Berical, 2022). To be sure, this type of intervention is effective, but prevention is also important (e.g., Stark, 2012). As individuals in communities across the world continue to get older, there will be more and more cases of EM, if the proportion of instances remains the same. Education about the occurrence and risk factors can help aid in prevention, though there is very little research on prevention, in comparison to that on intervention (Pillemer et al., 2016). However, along with education, Pillemer et al. (2016) offer additional suggestions for prevention of EM, including caregiver interventions (including respite care), money management programs, helplines, emergency shelters, and multidisciplinary teams (as described earlier for intervention). Recognition and understanding are the first steps in tackling this difficult problem.

## AGING WELL: PHYSICAL CHANGES

Aging well physically happens when we understand the physical changes that occur normally, and how they differ from disease processes. Changes that occur with normative aging are small, and if we remain physically active (within reason), our body will do what it needs to do. The psychological ramifications of this, though, are a different story. It is common for those in Western culture to fight the aging process—from denying its existence (pluck those gray hairs, they never happened) to desperately doing anything to reverse it (Kim, please don't eat poop). Regardless, aging is going to happen. Allowing it to happen, changing our perspective toward it, and understanding that aging is normal, natural, and beautiful will help.

## KEY TERMS

activities of daily living (ADLs)
ageism
antioxidants
compression of morbidity
disability
free radicals
Hayflick limit
instrumental activities of daily living (IADLs)
pruning
neural plasticity
osteoarthritis
osteoporosis
oxidation
quality of life (QoL)
rheumatoid arthritis
sarcopenia
telomeres

## COMPREHENSION QUESTIONS

1. Explain some of the normative physical changes that occur with our appearance in older adulthood. Include changes in height, weight, skin, and hair.
2. How does aging occur at a cellular level? Describe the Hayflick limit and the oxidation process.

3. What are the hormonal shifts that occur during the aging process, and how do they impact fertility, reproduction, and other body systems?
4. How do neurological changes in aging occur, and how do they compare to those occurring in Alzheimer's disease?
5. How do chronic illnesses like osteoporosis and cardiovascular disease impact older adults?
6. Distinguish between osteoarthritis and rheumatoid arthritis, also addressing their specific impact on functional limitations.
7. How do ADLs and IADLs contribute to day-to-day functioning, and how are they used as a measure of functional limitations?
8. How does disability impact quality of life?
9. Explain the compression of morbidity and how it relates to disease, disability, and socioeconomic status.
10. Distinguish between senior living options.
11. What are the factors that contribute to the risk of elder abuse? What are options for intervention and prevention?

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