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ORIENTATION ON THE AGING PROCESS

Some age-related physical changes are obvious: graying hair, and additional weight around the midsection, for instance. But many changes, such as the gradual loss of bone tissue and the reduced resiliency of blood vessels, go unnoticed, even for decades. Even though you're not aware of them, they're happening, nevertheless.

Knowing how and why your body changes with age will help you adapt to these changes down the road. This knowledge will also help you take steps to stop the development of conditions that occur with advancing age.

Anatomical Effects of Aging

Bones are deceptive: Their tough exterior conceals a vast network of blood vessels that transport nutrients to, and wastes away from, working bone cells.

The problem is, as time passes you lose more bone than you make. As a result, bones thin and become increasingly susceptible to fracture. As this process accelerates after age 50, osteoporosis becomes more common. Osteoporosis is a condition of progressive bone loss that is painful, disfiguring, and debilitating. Some bone loss with age is unavoidable, but the rate at which bone is lost is highly individual. Genetics and Menopause also play a role; Bone loss accelerates in the five years or so after menopause.

Bad habits, such as smoking and excessive use of alcohol, also contribute to bone loss, as does a sedentary lifestyle and inadequate intake of calcium and vitamin D.

However, much research proves that regularly performing weight-bearing exercise, such as walking and lifting weights, and getting an adequate amount of calcium and vitamin D can keep bones strong longer, building bone and reducing the risk of osteoporosis, even in the elderly

If you think you're getting shorter, you're probably right. Everyone shrinks with age. We're tallest by the end of our forties, then lose up to two inches in height by age 80. The loss in height is gradual but accelerates late in life. Why do we get shorter with age? There are myriad reasons including weaker muscles; water loss; postural changes; and deterioration of the spongy disks separating the vertebrae in our backbone, causing a compression of the spine.

Joints become less resistant to wear and tear with time. That's in part because of the changes in cartilage, the tissue that cushions the tips of the bones in your joints. Aging causes cartilage to lose water, making it more vulnerable to injury from repetitive motion and stress. Arthritis is characterized by pain and stiffness in the joints, and in some forms, swelling, redness, and heat.

Also, being overweight increases your risk of developing osteoarthritis. Regular physical activity may help reduce joint pain and stiffness and increase flexibility, muscle strength, and endurance. But don't put less strength and tone down to age: Inactivity wreaks much more havoc on muscles than time does. Inactivity exacerbates the muscle loss that age causes.

Skin is composed of two main layers: the epidermis, the layer you wash and dry, and the dermis, which lies directly below its more visible counterpart and is where hair and sweat glands originate. Dermal and epidermal cells diminish in aging. Wrinkles develop, primarily due to a loss of collagen, a cement-like protein that holds cells together.

When it goes, so goes elasticity, the property that provides skin with its resilience, helping you avoid laugh lines and crow's feet in your youth. Sun exposure, too, is a major contributor to the development of wrinkles. In fact, the sun causes most skin damage, including brown "age spots" and skin cancers.

As skin gets thinner and less elastic, it becomes more fragile, bruising and tearing more easily and taking longer to heal. The loss of some sweat and oil glands from the dermis may result in chronically dry skin. Thinning skin also compromises its ability to act as a barrier to infection. Skin injuries, more common with age, also increase your vulnerability to infection.

Aesthetics aside, thinning skin has implications for your health. Your skin participates in the body's vitamin D production. Vitamin D is calcium's partner in helping keep bones strong. It gets its start in skin that's been exposed to strong ultraviolet light.

Since aging skin has a limited capacity to initiate vitamin D production, vitamin D deficiency is more common in older people, especially those living in northern climates, where the sun is too weak to make vitamin D for half the year. Applying a sunscreen with a Sun Protection Factor (SPF) of 8 or higher helps protect your skin but blocks much-needed ultraviolet rays.

Cardiovascular Effects of Aging

Aging brings on a reduction in the strength of your heartbeat. (In fact, maximum heart rate per minute declines with each year and can be estimated by subtracting your age from 220.) Don't worry too much about this, though. Your heart pumps more blood per beat to compensate for a diminishing heart rate.

Older people take longer to recover from stress, a shock, or surprise. After exertion, such as exercise, more time passes before your body returns to its resting heart rate and blood pressure. Blood vessels change, too. Artery walls slowly thicken and become less elastic, increasing their vulnerability to normal wear and tear. Older people often feel colder than their younger counterparts, largely due to diminished circulation.

Plaque buildup increases with age. While arterial thickening is considered normal, it may predispose you to the buildup of plaque inside your arteries. Plaque restricts the flow of blood to the heart and the brain, which can lead to heart attack or stroke

Until about age 50, men have higher blood cholesterol concentrations than women. That's thought to be the result of the protective function of estrogen, a female hormone that helps keep blood cholesterol levels in check. Women suffer from heart attack and stroke an average of ten years later in life than men. But once menopause starts, a woman's risk for heart attack and stroke rises steadily with each passing year.

Why does it matter? Elevated blood pressure harms blood vessels. You may feel fine, but out-of-control blood pressure is an insidious condition that puts you at greater risk for stroke, heart disease, kidney failure, and other ailments.

Gastronomical Effects of Aging

You may not think of your mouth as being part of the gastrointestinal system, but in fact, it's the very starting point of the process by which you digest foods and absorb nutrients. As you age, chewing can become more difficult, you may chew more slowly, but not chew your food as efficiently. That's especially true if you have dentures or poor dentition.

Chewing is important, though, because it breaks down food so that stomach acid and intestinal enzymes can better attack it, digesting it to its smallest components to be absorbed by the intestine. As a result, you are also more vulnerable to choking. In addition, as many as 30

percent of Americans over the age of 60 do not produce enough stomach acid leading to a deficiency of vitamin B12 in your bloodstream and tissues.

As you get older, you produce less lactase, the digestive enzyme that breaks down the carbohydrate in dairy products known as lactose. If you have bloating and discomfort beginning within hours of eating dairy products, you probably have some diminished tolerance for lactose. Lactose intolerance is individual. That's why you may be able to tolerate some dairy products and not others. For example, many people with lactose intolerance can eat yogurt, which is lower in lactose than a glass of milk.

As you get older, your gut -- particularly your colon -- may become sluggish and less toned, making you more susceptible to constipation.

Your liver is your largest internal organ, weighing in at about three pounds. But it gets smaller with time, beginning around age 50. The liver's shrinkage begins at the same time that body weight and muscle mass start their decline. However, in the very old, the liver becomes disproportionately small. Having less liver tissue and decreased blood flow to this organ means that your body may handle certain medications differently.

Upon birth, each kidney tips the scale at a shade more than 1.5 ounces. As you grow, so do they -- to about nine ounces a piece. But as you age, they begin to decrease in size. By your eighties, they've shrunk to about six ounces each. Kidneys also gradually become less efficient at filtering your blood and making urine, beginning around age 30. And as you get older, less blood makes it to the kidneys.

You have two of them, and boy, are they a busy pair. All the blood in your body is constantly filtered by the kidneys, which determine the elements to keep and those to eliminate in urine. Without adequate kidney function, you would not be able to clear toxic byproducts of normal metabolism or those of medication breakdown.

Nor would you be able to regulate water balance and blood pressure. Functioning kidneys actually participate in bone health, too, by finishing off vitamin D production that begins in the skin and by regulating calcium and phosphorus loss in urine.

You can preserve kidney function by drinking plenty of fluids; controlling cardiovascular disease, including high blood pressure, as much as possible; and keeping blood glucose levels in check, especially if you have been diagnosed with diabetes.

Metabolic Effects of Aging

As you get older, it's normal to gain weight, right? It may be common -- but it's not desirable, and it's not inevitable either. Chances are you weigh more now than you did ten years ago. Or maybe your waistline has expanded, but the scale's remained steady.

Why has your shape gone south? A lower basal metabolic rate (BMR) is to blame. BMR is the number of calories you burn daily to fuel involuntary body functions, such as your heartbeat, brain function, and digestion. BMR is dependent upon body composition. The more muscle you have, the more calories you burn, 24 hours a day. That's because muscle is a high-maintenance tissue and requires more calories than fat to sustain itself.

Beginning at around age 25, total body fat starts to increase, while muscle mass and body water decrease. As a result, you may weigh more as you age or lose some of your youthful muscle tone. The decline in muscle mass that begins in your twenties, coupled with a decrease in activity level, means that you need fewer calories in your sixties than you did in your teens.

For women, menopause often means weight gain. When the ovaries stop producing the hormone estrogen, muscle mass may diminish to the point of lowering BMR. When that

happens, women gain a significant amount of fat, usually in the abdomen, even without consuming more calories.

Where you store extra fat also affects your health: If you're shaped like an apple -- packing fat in your mid-section -- you're at greater risk for heart disease than if you're shaped like a pear -- gaining weight around your hips and buttocks.

- Respiratory Changes
  - As you age, your lungs become less elastic, and your chest wall stiffens. In addition, the expansion of your trachea contributes to a decreased surface area in your lungs. You can't cough as forcefully, which also diminishes your ability to clear germs from your lungs. That's why older people are more prone to upper respiratory infections, such as colds.

If you ever smoked, your respiratory potential is reduced in your later years. As stated earlier, older adults also experience some difficulties with swallowing. This also increases the chances of aspirating particles of food or other substances into the lungs. Aspiration is a common cause of pneumonia in older adults.

Lung capacity and function drop off with time, which means you may be more winded after climbing a flight of stairs or taking a walk than you were 20 years ago, but exercise heads off some of the changes to the lungs and entire respiratory system. Physically active older people who regularly participate in aerobic exercises, including walking and cycling, are way ahead of the curve.

Their aerobic capacity is far greater than their peers who don't exercise, and better than younger, sedentary people. A generous intake of vitamin C also helps maintain pulmonary function as you age. Loss of pulmonary function is a major predictor of disease and death in older adults.

Sensory Effects of Aging

- Eyesight and Aging
  - Each passing decade brings changes that weaken eyesight, including the slow loss of ability to focus on close objects or small print.
  - Vision is limited in some way when tissues surrounding the eye lose their tone, and fat is lost, too, which results in droopy upper eyelids and the turning outward or inward of the lower lid; or your vision becomes cloudy, keeping light from getting through the clear lens of the eye. Over the years, the iris, the colored part of your eyeball, loses flexibility.
  - Your pupils -- the black holes in the iris that respond to light -- get smaller, and the lenses start to accumulate yellow substances, possibly as a result of exposure to sunlight. These changes predispose you to glaucoma, the product of excessive pressure inside your eyeball, which can lead to vision loss and blindness.
- Hearing and Aging
  - Hearing loss is one of the most common complaints of getting older, especially for men, who are more prone to hearing loss at any age.
  - Aging produces a progressive hearing loss at all frequencies, known as presbycusis. After age 55, your ability to detect changes in the pitch of sounds drops off dramatically. This can make your speech less understandable to others. In addition, the walls of your ear canal thin out, and earwax production falters.
  - Your eardrum thickens. You may even get arthritis in the joints that connect the bones found in the inner ear. Yet, no one knows for sure if these changes in hearing can be put down to the aging process. But it's certain that the loss of hair cells is what diminishes hearing the most.

- Hair cells are part of the inner ear that help transmit impulses to a nerve that transfers them to your brain for processing. Nerve damage, injury, exposure to loud noise, and certain medications can cause hair cell loss.

- Aging and Taste
  - You can thank your nose for your sense of taste, despite the thousands of taste buds populating your tongue: They can only detect a mere four out of thousands of possible flavors in foods.
  - The tongue recognizes only sweet, salty, bitter, and sour tastes. That's why enjoying food is limited without a healthy sense of smell. When you chew food and drink beverages, their aromas are released in your mouth.
  - Saliva dissolves flavor-producing substances in food and drink that make contact with your tongue's taste buds. More importantly, dissolved flavor compounds waft up the back of your throat, making their way to receptor cells in your nose. From there, nerves transmit flavor messages to the brain, allowing you to perceive and enjoy them.

If you're having trouble savoring the flavor of food, blame it on a lessened sense of smell. Time dulls your sense of smell, but not usually until you reach age 60, and then it varies from person to person. About half of adults over the age of 65 suffer from some diminished sense of smell. On the other hand, your sense of taste for sweet, salty, bitter, and sour foods may be remarkably intact until you're well into your seventies.

A zinc deficiency can also cause a decreased sense of taste. Zinc supplementation can help restore it if you do have a deficiency. Infections threaten sense of smell and, as a result, your ability to enjoy food. Some of the damage from the flu, colds, or hepatitis can be permanent. More often than not, acute illnesses, including sinus infections and seasonal allergies, block aromas from the receptor cells that relay flavor information to the brain.

As a result, you don't have as much capacity to savor the flavors of food. The pills you take every day to control medical conditions such as high blood pressure and arthritis can affect sense of taste, mainly by affecting the areas of the brain where you perceive flavors. Chemotherapy drugs and head and neck radiation also threaten flavor perception, sometimes permanently.

Aging brings changes in all people. These changes continue throughout life. Some changes are obvious in the way they alter physical appearance or in their visible effect upon body systems. Other changes are less seen - they affect internal body systems such as the blood systems.

Changes vary from individual to individual.

Needs and Concerns of Elderly and Disabled

The health concerns addressed in this section disproportionately impact older adults with disabilities and can impact all levels of patient care. Some of these health concerns include: Alzheimer's/Dementia; Depression; Incontinence; Physical Frailty, Disability and Personal Assistance Services; Nutrition and Elders.

- Alzheimer's/Dementia
  Dementia takes many forms, progresses along a variety of paths, and has numerous causes and treatments. Generally, dementia is characterized by loss of memory and other intellectual abilities significant and persistent enough to interfere with daily life.

Dementia is the leading cause of institutionalization among the elderly and is now known as the seventh leading cause of death in the United States (www.alz.org). Individuals suffering from dementia face numerous challenges which can put them at risk and impede their ability to access needed health care: Confusion about medications, appointments, and reporting symptoms; Increasing difficulty or inability to travel independently; Increased reliance on others to provide or coordinate care; Anxiety, hostility, agitation, personality changes and behavior disorders; Decreased ability to communicate effectively; Inability to perform normal activities of daily living without supervision; and Presence or absence of capable caregivers. The most common cause of dementia is Alzheimer's disease, accounting for up to two-thirds of all cases.

- Depression

  Depression is characterized by a pervasive depressed mood and a loss of interest or pleasure in previously enjoyed activities, but it can also present with a lack of energy, fatigue, poor sleep and appetite, physical slowing or agitation, poor concentration, thoughts of guilt, irritability or suicide. Our clinical experience shows that these symptoms are often complicated by chronic medical problems, cognitive impairment and substance abuse. Conditions such as heart attack, stroke, hip fracture or macular degeneration are known to be associated with the development of depression. If untreated, depression will not resolve on its own, and can last for many years. Of those who pursue treatment, very few older adults seek care from a mental health specialist; most request help from their primary care physician.

- Incontinence

  Studies have found that incontinence is an important factor in the decision to institutionalize elderly patients. Yet incontinence is not a normal part of aging, and has numerous medical and physiological causes. Once the type and cause of incontinence is identified, it can usually be cured or greatly improved with treatment.

Shame and embarrassment associated with incontinence is not only common, but harmful to patients who could be offered care to improve their condition. Fewer than half of older adults affected by incontinence consult a health professional or even mention the problem at an office visit.

Untreated incontinence can lead to increased isolation and emotional distress as well as rashes and other health problems. Incontinence is often caused by weakened or overactive bladder muscles. It can also be a symptom of conditions such as bladder stones, blockage from an enlarged prostate, tumors or urinary tract infections. The treatment for incontinence varies, depending on the cause. Medications, minor surgical procedures, or exercises can often effectively treat the problem.

Risk factors for incontinence among the elderly include the following:

- Depression
- Heart Attack
- Stroke
- Congestive Heart Failure
- Obesity
- Chronic obstructive lung disease
- Chronic cough
- Diabetes
- Difficulty with activities of daily living

Physical Frailty/Disability and Personal Assistance Services

Physical frailty and disability increase with age.

- Frailty is not a disease, but a combination of advanced age and a variety of medical problems resulting in unintentional weight loss, exhaustion, weakness, slow walk and low levels of physical activity. Frailty is predictive of falls, worsening mobility, disability, hospitalization and death.

- Disability is usually defined in terms of a decline in functional ability. While disability has numerous medical- and service-based criteria, among older adults it tends to be defined in terms of limitation in basic Activities of Daily Living (ADLs) such as eating, dressing, bathing, toileting or Instrumental Activities of Daily Living (IADLs) such as cooking, grocery shopping, or making phone calls.

- Personal Assistance Services (PAS) are the basic building blocks of long term care services for people with disabilities provided by paid or unpaid, formal or informal, caregivers.

- Nutrition and Elders
  As adults age, their nutritional needs, food tolerance, and access to nutritious foods change. Some medications can also result in food interactions that can interfere with the nutritional status of seniors.

Proper eating and nutrition are directly related to health issues and certain medical conditions seniors commonly encounter. Eating more fresh fruits and vegetables, and less processed foods may be the most important diet change all people including seniors can make. Yet access to these foods can be limited by barriers faced by many elderly patients of community health centers. Dietary habits of seniors are often driven by factors unrelated to nutritional needs: Changes in how food tastes, Diminished appetite or thirst, Difficulty chewing or swallowing, Access to healthy foods including cost and proximity to grocery stores, and/or Inability to read or understand food labels.

Social Issues

Given high levels of frailty, disability and chronic illness of older adults, social issues loom large in meeting the basic needs of this population. Dependence on others to meet basic needs can have a tremendous impact on family relations. Financial needs become significant as income or assets may become more limited, health or personal care needs increase, and the ability to manage finances independently may diminish. Another personal freedom that often becomes compromised by advanced age and disability is the ability to drive safely.

- Family Relations
  For elderly patients, especially those who are suffering from physical or cognitive decline, the proximity, availability and financial resources of relatives can have a significant impact on the patient's health and well-being. Family members can have an extremely supportive or damaging role in the life of frail older adults, depending on the nature of the relationship.
- Money Management
  It is estimated that 5-10% of all elders living in the community would benefit from some form of assistance with daily money management (National Center on Elder Abuse, 2003). This commonly includes the need for assistance with reading bills, writing checks, paying bills on time, banking, budgeting, or making sound financial decisions.

In some cases, a trustworthy family member or other caring individual will step in to assist with basic needs. Too often however, seniors are isolated and lack reliable support. When elderly patients lose the physical or cognitive ability to manage their finances independently, they become vulnerable to financial exploitation, eviction, homelessness, impoverishment, or institutionalization.

Some important considerations concerning money management needs: *Privacy* — Most seniors, regardless of their financial, mental or physical status, are very private about their financial situation. Many are reluctant to accept assistance of any kind, even if it is provided free of charge. *Trust* —Money management needs must be addressed with sensitivity, and by a trusted individual such as a medical provider or social worker. Always support the older adult in achieving the "least restrictive" arrangement to insure their financial well-being. *Exploitation* — Low-income seniors are just as vulnerable to financial exploitation as those with higher income or assets. It is not unusual for SSI checks or other limited resources to be taken over, often by family members or others who may be dependant on the impaired older adult for money and/or housing.

- Driving Safety
  Although everyone ages differently and some are perfectly capable of continuing to drive into the seventies and beyond, driver safety is an important issue that should be addressed with all seniors. Not only are older adults more likely to get in multiple-vehicle accidents than younger drivers, but car accidents are more dangerous for seniors than for younger people. Key risk factors for senior drivers:
  - Vision decline, particularly at night
  - Hearing loss
  - Limited mobility & increased reaction time
  - Medications, which may cause drowsiness and other side effects
  - Drowsiness, as aging makes sleeping more difficult, resulting in daytime tiredness
  - Dementia or brain impairment, which may cause delayed reactions, impaired judgment, and increased frustration.

Housing Issues

This section will address the unique and complex housing issues that older adults often face. While housing issues are not strictly healthcare related, when housing needs are not addressed, health suffers, and treatment plans fail. Understanding the housing options and needs that older adults often face will aid health centers in addressing unmet or changing needs and making appropriate referrals for elderly patients. Furthermore, living arrangements among older adults, such as living alone or homelessness, are associated with numerous health issues that may require awareness or attention within community health centers.

- Overview of Housing Issues for Elders
  The relationship between health and housing is complex and challenging for many older adults. Fundamental housing needs can become huge areas of concern for frail or disabled older adults. In addition to critical matters such as affordability and access, the decision-making process about when or if to move to senior housing or another residential setting can be overwhelming, confusing and taxing for elders and their family members. Elderly patients and their family members who are facing housing decisions often need support or guidance in the process, without which their health or safety may be jeopardized by an unsuitable or unsafe living environment.
- Living Alone
  Many elderly patients do not have the support they need to live alone safely therefore, living arrangements can have a significant impact on their health and well-being. When mobility or opportunities for social engagement decrease with age, the presence or absence of support within the home becomes increasingly important. For those who are living alone, the lack of in-home companionship, or assistance to get to medical appointments can contribute towards high levels of loneliness, and often unmet needs. There are strong correlations between aging, living alone and declining physical and mental health of older adults.

Many individuals are living alone for the first time, without all of the necessary skills or resources. Cooking, shopping, budgeting or handling other household matters or health needs can be daunting responsibilities for those who find themselves living alone for the first time in later life.

- Homelessness
  Homelessness is a problem faced by a growing number of older adults. Homeless elders include individuals who have grown old while homeless, as well as those who become homeless in later life. Chronically homeless adults often suffer from mental illness and/ or substance abuse. Later-life homelessness may occur due to dementia, extreme poverty, lack of affordable housing, isolation and limited functioning.

The elderly are largely invisible among the homeless, and typically have needs that are greater than their younger counterparts. With the aging of the "baby boomers" and the increased demand for affordable housing, we can expect the numbers to continue to grow.

Added challenges faced by many older adults relate to questions of capacity, neglect or self-neglect. Homeless shelters and services are rarely designed for seniors, and may not be fully accessible. Loneliness, depression and suicide is typically high among older adults, and may be higher among the homeless population. Theft is often a concern among the homeless, and the elderly can be easy targets in shelters or on the streets.

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