

WELCOME TO

NUTRITION & AGING

Nutrition in Your Life

Take a moment to envision yourself 20, 40, or even 60 years from now. Are you physically fit and healthy? Can you see yourself walking on the beach with friends or tossing a ball with children? Are you able to climb stairs and carry your own groceries? Importantly, are you enjoying life? If you're lucky, you will grow old with good health, **but that depends on your actions today - and every day from now until then.** Making nutritious foods and physical activities a priority in your life can help bring rewards do continued health and enjoyment in life.



"There is no dress-rehearsal for life."

- ANONYMOUS

Wise food choices, made throughout adulthood, can support a person's ability to meet physical, emotional, and mental challenges and to enjoy freedom from disease. Adequate nutrition and fitness can help one reach the maximum life span by postponing and slowing disease. Nutrition affects aging by its role in disease prevention. Though, some physiological changes do occur. Below are changes with age that are beyond your control and that you will probably need to accept. Note that none are chronic diseases:

- | | |
|---------------------------------------|-------------------------------|
| - Graying of hair | - Reduced touch sensitivity |
| - Balding | - Slowed reactions (reflexes) |
| - Some drying and wrinkling of skin | - Slowed mental function |
| - Impairment of near vision | - Menopause (women) |
| - Some loss of hearing | - Loss of fertility (men) |
| - Reduced taste and smell sensitivity | - Loss of joint elasticity |

Much of this course will focus on nutritional needs in older adults. Topics include diet and nutrient guidelines, diet modifications, body system changes, body weight issues, nutrition related chronic diseases and how to prevent them, barriers to proper nutrients, drug/nutrient interactions, and community resources.

Importance of Nutrition

Nutrition is about the many roles of foods. Food is fuel, enjoyment, comfort, and a symbol of traditions, rituals, and celebrations. Food serves as a connection for socializing. When things go well, we take food for granted. We expect to have sufficient quantities of safe, appetizing food whenever we are hungry. During adulthood, we are often too busy to pay much attention to food.

How does food and nutrition enhance life? **Lifestyle factors have a greater impact on long life than genetics, health care systems, and the environment. Nutrition and exercise are at the top of the list of lifestyle factors that contribute to a long and healthy life.** Good nutrition throughout adulthood will reduce the risk of leading causes of death of later adulthood, namely heart disease, cancer, stroke, and diabetes. Nutrition during adulthood supports and active lifestyle, contributes to maintenance of healthy weight, and promotes physical and mental health and well-being. Below are numbers from the CDC that reinforce that lifestyle factors have the greatest impact on longevity:

–10% access to health care

–19% genetics

–20% environment (pollution, etc.)

–51% lifestyle factors (besides not smoking, a healthy diet, and ample exercise contribute most to longevity).

Definition of Adulthood in the Lifecycle

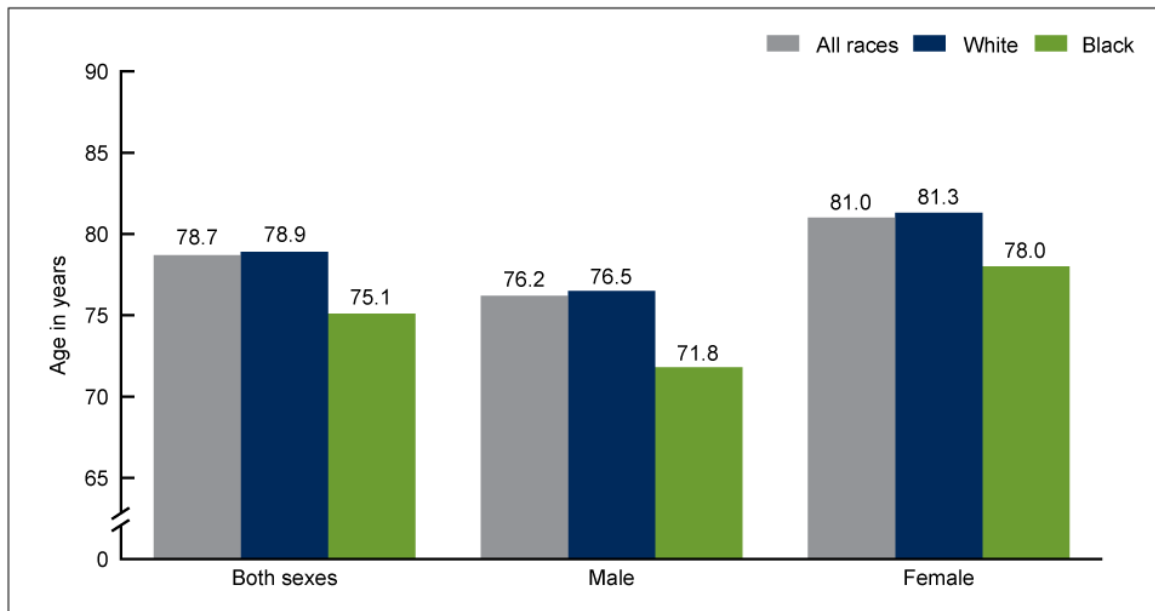
There is no real definition for what counts as "old." Below are various organizations eligibility for services or definition considered to be elderly.

- 70 - DRI category
- 60 - Eligibility for the Elderly Nutrition Program
- 65 - Eligibility for Medicare
- 60 - World Health Organization
- U.S. Census Bureau uses: "young old," "aged," and "oldest old"

Population Trends

Life expectancy is the average number of years of life remaining for persons in a population cohort or group; most commonly reported as life expectancy from birth. Life expectancy at birth in the U.S. is 78.5 years. **Life span** is the maximum number of years someone might live; human life span is projected to range from 110 to 120 years.

Figure 2. Life expectancy at birth, by race and sex: United States, 2010



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Manipulation of Diet

In efforts of understand longevity, researchers have not only observed people, but have also manipulated influencing factors, such as diet, in animals. This research has given rise to some interesting factors and suggestive findings.

Energy (calorie) restriction in animals. Animals (including rats, mice, fish, flies, worms, and yeast) live longer and have fewer age-related chronic diseases when their energy intakes are restricted. Exactly how energy restriction prolongs life are unclear.

Energy restriction in humans. Energy restriction extends life, reduces metabolic rate and oxidative stress, improves insulin sensitivity, and alters neuroendocrine and sympathetic nervous system function in animals. Applying these results to humans is problematic. Extreme starvation to extend life, like any extreme, is rarely, if ever, worth the price. Moderation, on the other hand, may be valuable. Many of the physiological responses to energy restriction also occurs in humans whose intake are moderately restricted. When humans cut back on their usual energy intake by 10-20%, body weight, body fat, and blood pressure drop, and blood lipids and insulin response improve - favorable changes for preventing chronic diseases.

Physiological Changes

As aging progresses, as mentioned above and on the course BlackBoard, inevitable changes will occur. We commonly see with aging, shifts in body composition and subsequent loss of physical resilience (most is related to a decline in activity and diet.)

Weight Gain

Over half of the adults in the U.S. are now considered overweight or obese (using BMI guidelines). See BMI chart below. Being overweight/obese is associated with cardiovascular diseases, type 2 diabetes, certain cancers and other chronic diseases. Mean body weight gradually increases with aging, peaking between 50 and 59 years. The lack of physical activity moderates weight gain and increases body fat. Menopause (lack of estrogen) is associated with, but not the cause of, weight gain and decrease in muscle mass.

The importance of body weight in defending against chronic diseases differs for older adults. Being moderately overweight may not be harmful. For older adults, a low body weight may be more detrimental than a high one. For adults over 65, health risks do not become apparent until BMI reaches at least 27 - and the relationship tends to diminish with age until it disappears by age 75. Not all older adults are overweight. In fact, the prevalence of overweight decreases with increasing age after age 55. Low body weight often reflects malnutrition. Many older adults experience unintentional weight loss, in large part because of inadequate food intake. Without adequate nutrient reserves, an underweight person may be unprepared to fight against diseases. Older adults have higher nutrient requirements (especially for vitamins and minerals) but take in fewer calories so the challenge becomes how to get in more nutrients from fewer calories.

BMI chart	weight																
height	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260
4' 10"	20.9	23.0	25.1	27.2	29.3	31.3	33.4	35.5	37.6	39.7	41.8	43.9	46.0	48.1	50.2	52.2	54.3
4' 11"	20.2	22.2	24.2	26.3	28.3	30.3	32.3	34.3	36.4	38.4	40.4	42.4	44.4	46.4	48.5	50.5	52.5
5' 0"	19.5	21.5	23.4	25.4	27.3	29.3	31.2	33.2	35.2	37.1	39.1	41.0	43.0	44.9	46.9	48.8	50.8
5' 1"	18.9	20.8	22.7	24.6	26.4	28.3	30.2	32.1	34.0	35.9	37.8	39.7	41.6	43.5	45.3	47.2	49.1
5' 2"	18.3	20.1	21.9	23.8	25.6	27.4	29.3	31.1	32.9	34.7	36.6	38.4	40.2	42.1	43.9	45.7	47.5
5' 3"	17.7	19.5	21.3	23.0	24.8	26.6	28.3	30.1	31.9	33.7	35.4	37.2	39.0	40.7	42.5	44.3	46.1
5' 4"	17.2	18.9	20.6	22.3	24.0	25.7	27.5	29.2	30.9	32.6	34.3	36.0	37.8	39.5	41.2	42.9	44.6
5' 5"	16.6	18.3	20.0	21.6	23.3	25.0	26.6	28.3	30.0	31.6	33.3	34.9	36.6	38.3	39.9	41.6	43.3
5' 6"	16.1	17.8	19.4	21.0	22.6	24.2	25.8	27.4	29.0	30.7	32.3	33.9	35.5	37.1	38.7	40.3	42.0
5' 7"	15.7	17.2	18.8	20.4	21.9	23.5	25.1	26.6	28.2	29.8	31.3	32.9	34.5	36.0	37.6	39.2	40.7
5' 8"	15.2	16.7	18.2	19.8	21.3	22.8	24.3	25.8	27.4	28.9	30.4	31.9	33.4	35.0	36.5	38.0	39.5
5' 9"	14.8	16.2	17.7	19.2	20.7	22.1	23.6	25.1	26.6	28.1	29.5	31.0	32.5	34.0	35.4	36.9	38.4
5' 10"	14.3	15.8	17.2	18.7	20.1	21.5	23.0	24.4	25.8	27.3	28.7	30.1	31.6	33.0	34.4	35.9	37.3
5' 11"	13.9	15.3	16.7	18.1	19.5	20.9	22.3	23.7	25.1	26.5	27.9	29.3	30.7	32.1	33.5	34.9	36.3
6' 0"	13.6	14.9	16.3	17.6	19.0	20.3	21.7	23.1	24.4	25.8	27.1	28.5	29.8	31.2	32.5	33.9	35.3
6' 1"	13.2	14.5	15.8	17.1	18.5	19.8	21.1	22.4	23.7	25.1	26.4	27.7	29.0	30.3	31.7	33.0	34.3
6' 2"	12.8	14.1	15.4	16.7	18.0	19.3	20.5	21.8	23.1	24.4	25.7	27.0	28.2	29.5	30.8	32.1	33.4
6' 3"	12.5	13.7	15.0	16.2	17.5	18.7	20.0	21.2	22.5	23.7	25.0	26.2	27.5	28.7	30.0	31.2	32.5
6' 4"	12.2	13.4	14.6	15.8	17.0	18.3	19.5	20.7	21.9	23.1	24.3	25.6	26.8	28.0	29.2	30.4	31.6
6' 5"	11.9	13.0	14.2	15.4	16.6	17.8	19.0	20.2	21.3	22.5	23.7	24.9	26.1	27.3	28.5	29.6	30.8
6' 6"	11.6	12.7	13.9	15.0	16.2	17.3	18.5	19.6	20.8	22.0	23.1	24.3	25.4	26.6	27.7	28.9	30.0
BMI category	underweight					normal							overweight			obese	

Body Composition Changes

In general, older people tend to lose bone and muscle and gain body fat. Many of these changes occur because of some hormones that regulate appetite and metabolism become less active with age, medications can alter appetite, and a decline in physical activity. Loss of muscle, known as sarcopenia, can be significant in the later years. As muscles diminish and weaken, people lose the ability to move and maintain balance, making falls likely. The limitations that accompany the loss of muscle mass and strength play a key role in the diminishing health that often accompanies aging. Optimal nutrition and regular physical activity can help maintain muscle mass and strength and minimize the changes in body composition associated with aging.

The saying holds true, "Use It or Lose It." In older adults, weight-bearing and resistance exercise increases lean muscle mass and bone density. Thus, regular physical activity helps maintain functional status.

Immune System Changes

Changes in the immune system also bring declining function status with age. In addition, the immune system is compromised by nutrient deficiencies (mainly protein, zinc, vitamins C and E and other antioxidants.) Thus the combination of old age and malnutrition makes older people vulnerable to infectious diseases. Older adults can improve their immune system responses by exercising regularly and eating a balanced and nutritious diet.

Gastrointestinal (GI) Tract Changes

In the GI tract, the intestinal wall loses strength and elasticity with age, and GI hormone secretions change. All of these changes slow motility making constipation common in the elderly. This is made worse with a low fiber diet and/or a low fluid intake.

Achlorhydria (reduction of hydrochloric acid in stomach) and atrophic gastritis (inflammation of the stomach with atrophied mucosa and glands) are conditions that affect over one-third of those over 60. These conditions can impair digestion and absorption of nutrients, most notably vitamin B12, but also folate, calcium, iron, and zinc.

Difficulty in chewing and swallowing, medically known as dysphasia, occurs in all age groups, but especially in the elderly. Even swallowing liquids can be a problem for some people. Consequently, the person may eat less food and drink fewer beverages, resulting in weight loss, malnutrition, and dehydration. The diet for dysphasia typically provides. Moist, soft-textured, tender-cooked, or puréed foods and thickened liquids. This diet is characteristically low in fiber.

Sensory Changes

Sensory losses can also interfere with an older person's ability to obtain adequate nourishment. Sight, hearing, taste, and smell are all effected, but taste and smell are the most common. At approximately 60 years, taste buds decline, thus a decrease in taste sensitivity. Around this same time the olfactory nerve endings decrease. With limited taste and smell cues, saliva production, gastric juices and pancreatic secretions

decrease, therefore effecting appetite and digestion. Further discussion will be on medications and nutrient interactions but note that medications affect taste and smell more than aging. Also, imagine someone with failing eyesight, driving to the grocery store becomes impossible, reading food labels and counting money is now difficult so much that the person doesn't buy the needed food.

Oral Health Changes

Tooth loss, gum disease and ill-fitting dentures, which are all common in old age (especially when regular dental care over a lifetime is overlooked) makes chewing difficult or painful. Dentures, even when they fit properly, are less effective than natural teeth, and inefficient chewing can cause choking. People with tooth loss, gum disease, and ill fitting dentures tend to limit their food selection to soft foods. Foods such as corn on the cob, apples, or whole grain rolls are replaced by creamed corn, applesauce, and mashed potatoes. People without teeth eat fewer fruits and vegetables and have less variety in their diets. Consequently, they have low intakes of fiber and vitamins.

Economic Changes

Overall, older adults today have higher incomes than elders of past generations. Still, poverty is a major problem for over 20% of people over 65. People of low income are likely to have inadequate food and nutrient intakes.

Psychosocial Changes

Of all the changes discussed, psychosocial changes (mainly depression, altered mood with feelings of despair, sadness, and discouragement) are responsible for the loss of health, more so than other changes. Depressed people, even those without disabilities, lose their appetite and motivation to cook or even eat. Quite often the depression stems from the grief and sadness at the death of a spouse, friend or loved one. When a person is suffering the heartache and loneliness of bereavement cooking meals may not seem worthwhile. Support from family and friends, especially at mealtimes, can help some overcome depression and enhance appetite and nutritional status.

Nutritional Risk Factors For Older Adults Are:

- Hunger, poverty, low food and nutrient intake
- Functional disability
- Social isolation or living alone
- Urban and rural demographic areas
- Depression, dementia, dependency
- Poor dentition and oral health
- Diet-related acute or chronic diseases
- Use of multiple medications (Polypharmacy)
- Minority, advanced age

DETERMINE Checklist

Developed by the American Academy of Family Physicians, Academy of Nutrition and Dietetics, and National Council on Aging. The checklist integrates a list of warning signs of poor nutritional health in older adults. **Refer to the separate NSI-DETERMINE handout** and determine your nutritional health (or someone you know that may be at nutritional risk.) The Nutrition Checklist is based on the warning signs described below. Use the word DETERMINE to remind you of the warning signs.

Disease: Any disease, illness or chronic condition that causes you to change the way you eat, or makes it hard for you to eat, puts your nutritional health at risk. Four out of five adults have chronic diseases that are affected by diet. Confusion or memory loss that keeps getting worse is estimated to affect one out of five or more of older adults. This can make it hard to remember what, when or if you've eaten. Feeling sad or depressed, which happens to about one in eight older adults, can cause big changes in appetite, digestion, energy level, weight and well-being.

Eating Poorly: Eating too little and eating too much both lead to poor health. Eating the same foods day after day or not eating fruit, vegetables and milk products daily will also cause poor nutritional health. One in five adults skips meals daily. Only 13 percent of adults eat the minimum amount of fruits and vegetables needed. One in four older adults drinks too much alcohol. Many health problems become worse if you drink more than one or two alcoholic beverages per day.

Tooth Loss/Mouth Pain: A healthy mouth, teeth and gums are needed to eat. Missing, loose or rotten teeth or dentures, which don't fit well or cause mouth sores make it hard to eat.

Economic Hardship: As many as 40 percent of older Americans have incomes of less than \$6,000 per year. Having less--or choosing to spend less--than \$25 to \$30 per week for food makes it very hard to get the foods you need to stay healthy.

Reduced Social Contact: One-third of all older people live alone. Being with people daily has a positive effect on morale, well-being and eating.

Multiple Medicines: Many older Americans must take medicines for health problems. Almost one half of older Americans take multiple medicines daily. Growing old may change the way we respond to drugs. The more medicines you take, the greater the chance for side effects such as increased or decreased appetite, change in taste, constipation, weakness, drowsiness, diarrhea, nausea and others. Vitamins or minerals when taken in large doses act like drugs and can cause harm. Alert your doctor to everything you take.

Involuntary Weight Loss/Gain: Losing or gaining a lot of weight when you are not trying to do so is an important warning sign that must not be ignored. Being overweight or underweight also increases your chance of poor health.

Needs Assistance in Self Care: Although most older people are able to eat, one of every five has trouble walking, shopping, buying and cooking food, especially as they get older.

Elder Years Above Age 80: Most older people lead full and productive lives. But as age increases, risk of frailty and health problems increase. Checking your nutritional health regularly makes good sense.