

ElderCare:

Healthcare for the Aging Patient

Changes of Healthy Aging



Introduction/Purpose Statement

Why do a program on aging? Aren't older people just the same as other adults – just older? Well, the answer is “no.” Just as children are different from young adults, the older adult is different. We study aging because health care assessment and management changes with age.

There are three general categories related to health care and aging:

- Healthy (normal) aging without disease
- Typical disorders of aging
- Diseases and disorders complicated by aging

The purpose of this home study program is to review normal changes that are associated with aging. The rest of the ElderCare series will focus on the typical changes in aging and issues related to disease and disorders in the geriatric patient.

Target Audience

This home study was designed for health care professionals with little to no familiarity with changes of healthy aging.

Content Objectives

1. Identify the physical, psychological, and social changes that may occur in a healthy elder.
2. Describe activities and interventions that will help seniors maintain a healthy, active lifestyle.

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In accordance with ANCC requirements governing approved providers of education, the following disclosures are being made to you prior to the beginning of this educational activity:

Requirements for successful completion of this educational activity:

In order to successfully complete this activity you must read the home study, complete the post-test and evaluation, and submit them for processing.

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As required by ANCC, this continuing education activity must carry an expiration date. The last day that post tests will be accepted for this edition is **December 31, 2017**—your envelope must be postmarked on or before that day.

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<p>For completing this Home Study and evaluation, you are eligible to receive:</p>	<p>1.0 MN Board of Nursing contact hours / 0.83 ANCC contact hours</p> <p><i>Criteria for successful completion:</i> You must read the home study packet, complete the post-test and evaluation, and submit them to TCHP for processing.</p> <p>The Twin Cities Health Professionals Education Consortium is an approved provider of continuing nursing education by the Wisconsin Nurses Association, an accredited approver by the American Nurses Credentialing Center’s Commission on Accreditation.</p>
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What is aging and why do we do it?

It is inevitable – all living organisms age. But why? The search for eternal life is as old as humankind; more recently, the quest for answers on how our bodies age and how to stop the aging process has become a nationwide obsession.

To start with, then, what is aging? Defining aging has stymied researchers, so let's use a common, simple definition – aging is the process of growing older. Another definition is that aging is “the process of changing with time, especially during the later part of life.”¹

There are many theories on why we age. They are separated into two main groups: programmed theories and error theories.

- Programmed theories study the genetic aspect of aging - looking at the biological clock.
- Error theories focus on how the DNA, RNA, enzymes or the structure of cells are damaged through environmental factors, such as oxygen free radicals, radiation, or toxin exposure.

Programmed Theories

Researchers have been diligently looking at genetic coding (DNA and RNA) to determine if there is a pre-destined time that the cell has to live. They have found that there are certain “death” genes, which will act to destroy cells at a given time. The genetic forces may explain why some families have very long lives and other families have very short lives.

Error Theories

The error theories focus on cellular damage. Some theories look at DNA and RNA errors and others look at structural damage. The most prevalent theory out now relates to the oxygen free radicals. Oxygen free radicals are normally a part of metabolism of oxygen dependent nutrients (huh?) – in other words, when things like animals and plants metabolize oxygen-containing food, oxygen-free radicals are produced. Oxygen free radicals are also made when there is exposure to outside contaminants, such as cigarette smoking, lead, mercury, iron, copper, radiation, phenols and caffeine.

As the oxygen free radicals are made, they bind to other parts of the cell, eventually destroying the mitochondria of the cell. Over time, the cells are destroyed, the tissue becomes dysfunctional, and the organs start to have problems.

The Age of the Elder

Regardless of what causes aging, we all do it! Although the maximal life expectancy continues to hover around 100 to 110 years, the **average** life expectancy has changed from 47 in 1900 to 76.5 years in 1997. This huge change means that people are around for a lot longer – and may have illnesses and diseases that require treatment. That's why people in health care are so interested in aging. Here are the numbers that we're looking at....

Number of Americans Age 65 or Older ²

1880	1.7 million
1900	3.0 million
1920	4.9 million
1940	9.0 million
1960	17.2 million
1980	26.1 million
2000	34.9 million

www.ssa.gov/history/lifeexpect.html

It will be our job to help elders maintain their health and abilities, as much as it is to intervene with their illness or disorder.

What is normal physical aging?

We all hope to age with a minimum of changes in our bodies and in our minds. If we can do that without the typical diseases of the older adult, it is called healthy or normal aging. This section will go through each of the body systems with what humans can expect when they age, as well as what you can do to help the elder patient to maintain or even improve their quality of life.

Life at the cellular level

Based on the oxygen free radical theory, researchers believe that mitochondria are destroyed by super-charged oxygen molecules. Some people believe, and it is borne out by research, that antioxidants will negate the effects of the oxygen free radicals. These antioxidants include vitamin E, selenium, vitamin C, and glutathione.

General appearance

When you picture someone who is older, you think of the wrinkles, gray hair, and stooped posture. All of these changes are normal in the elder.

The skin normally thins with time and has a decrease in the amount of pigment cells (melanocytes). The aging skin looks translucent, thin, and pale. Age spots (also known as liver spots) are large pigmented areas that appear on the skin and are the result of sun damage.

The connective tissue under the skin becomes less elastic, and can appear leathery, particularly in skin that has been “photo aged,” or exposed to sun on a long-term basis.

The loss of body fluid and subcutaneous tissue can cause the skin to fold against itself, which is known as a wrinkle.

The gray hair so commonly seen in older people is because of a lack of melanin in the hair follicle. Both men and women exhibit hair loss and follicle size changes. Men tend to lose hair on the top and sides of their heads; women tend to lose hair throughout their scalp. Hair also becomes thinner and finer on the head, although it may be coarser on the face, particularly in the nose, ears, and eyebrows.

The body shape and posture changes with aging. Bone density changes cause the posture to become stooped and the overall height to decrease by 1-3 inches by 80-90 years. Fat tissue is deposited in the center of the body and is lessened around the extremities, making the elder look “fat” in the middle with “skinny” arms and legs. These changes in the fat deposition can predispose an elder to hypothermia because of the loss of the thermal layer.

Maintaining A Healthy Appearance

Skin care is vital in the elderly person. Injury to the thinned tissue can lead to hematomas and skin tears. The loss of sebaceous oil glands can cause itching and lead to further injury. The keys to maintaining good skin integrity are to:

- Drink lots of fluids and eat a healthy diet
- Use lotion liberally to replace lost oils
- Decrease frequency of hot baths/showers
- Protect fragile tissues from pulling, pinching, or shearing

Graying and thinning of hair cannot be stopped – no matter what the ads say! From a psychological standpoint, using conditioners, hair coloring, getting regular hair cuts, and hairpieces can be of huge aesthetic value.

Finally, regular exercise can be of benefit in decreasing bone loss (and therefore, height), and maintaining lean body mass.

Cardiovascular system

It is very interesting that the heart of the elder at rest will produce the same cardiac output as the heart of a much younger person. The problem comes in, though, when the elder needs to have an increased heart rate or output because of low blood pressure. The aging heart is not able to respond with a fast heart rate (tachycardia) and so pumps harder (increases the stroke volume). Pumping harder means that the heart has to work harder and use more oxygen.



The elders’ blood vessels become less compliant, causing an increased workload for the heart. The left ventricle increases in muscle mass and size to accommodate the increase in workload.

These two major changes – decrease in heart rate response and increased workload – cause problems when the elder has atherosclerosis or is put under heavy stress. The classic example is the elder who has a heart attack when shoveling snow.

Maintaining Cardiovascular Health

Nothing new here! Decreasing the risk of heart disease in the elder is the same as anyone else – controlling high blood pressure, cholesterol levels, and diabetes; eating a healthy diet with weight loss as necessary; and stopping smoking.

Strongly encourage exercise – for all elders! Regular exercise for 20 minutes three times a week can improve cardiac reserve. Seniors should know that the 20 minutes of exercise does not need to be done all at once – it can be split throughout the day.

Pulmonary system

From the top – the larynx (voice box) changes with age – usually becoming weaker and lower pitched in women and higher pitched in men.



The lungs change slowly and progressively with age. The chest wall becomes stiffer (less compliant), which means that the elder has a harder time taking a deep breath. The diaphragm does not ascend as quickly during exhalation, making coughing more difficult. The vital capacity – the total amount of air in the lungs after a maximal breath – decreases, and there is a progressive decrease in arterial oxygenation.

On the infection control front, the cough reflex is harder to stimulate, and the cilia and cells that produce mucous don't work as well, all allowing bacteria and other organisms to enter into the lung more easily.

All of these changes make it more difficult for the elder to tolerate stress and clear infections.

Maintaining Pulmonary Health

Keep the elder talking! Continued exercise of the larynx will keep it in shape, arresting the changes that occur as a result of aging.

Exercise is as good for the lungs as it is for the heart. Any type of exercise that will cause the elder to breathe more deeply is encouraged.

Seniors need to be aware that they should regularly take deep breaths to avoid collapse of the air sacs (alveoli), especially after surgery. Staff should be aware that the elder needs more attention paid to pulmonary health than a younger patient.

Gastrointestinal system

Does the GI system really change with aging? There are a lot of controversies out there:

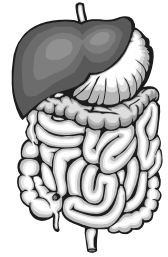
- Is dysfunction of swallowing normal?
- Is presbyesophagus a normal aging change?
- Does gastric emptying change?
- Is constipation normal?

It is certain that the stomach produces less gastric acid, which may affect drug absorption. The elder will also have a harder time absorbing calcium, possibly related to a Vitamin D deficiency.

Constipation is probably because of nutrition and fluid intake rather than structural changes.

The liver is affected by aging. Its storage capacity and its ability to metabolize drugs such as the benzodiazepines, chlordiazepoxide, and aminopyrine is diminished. Alcohol metabolism remains normal.

Lastly, the gallbladder contracts normally in the elder, but there is an increased amount of cholesterol and phospholipids in the bile, causing an increased incidence of gallstones.



Maintaining Gastrointestinal Health

Like a mantra – exercise for the elder! Exercise helps gastric and intestinal motility and may alleviate some of the constipation that many elders face.

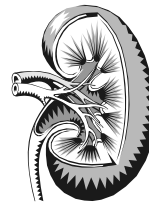
Encourage the elder to eat a healthy diet with vegetables, fruits, and bran, as well as fluids, to decrease the incidence of constipation.

Health care providers should be cautious when administering or ordering medications because of the altered metabolism by the liver.

Genitourinary system

The kidneys, urological system, and reproductive system have major changes with aging which can really affect the quality of life of an elder.

The kidneys start losing nephrons in mid-life and will have a 30-40% decrease by the age of 80. This accompanies a decrease in renal plasma flow of 10% per decade after 20 years of age. That said, the kidneys will continue to function normally unless they are stressed by injury, illness, or drugs.



Another problem that occurs related to the kidneys is the lack of response to vasopressin, which should make the kidneys save water and sodium. Because of this, dehydration and hyponatremia become more common in the elder.

Benign prostatic hypertrophy (BPH) affects almost 90% of men who are over 80 years. BPH will eventually grow to obstruct the urethra, leading to a problem with urination.

Data shows that impotence is not a normal aging change, but there are changes in the frequency of sexual activity for both men and women.

For women, menopause generally occurs after age 50 and is accompanied by symptoms such as hot flashes, agitation, and sleep disturbances. After menopause, the vaginal walls are thinner and less elastic. Vaginal secretions lose some of their volume and are less lubricating, and the labia atrophies.

For men, aging will cause testicular atrophy and will cause a decreased sperm count (although sperm production continues).

Maintaining Genitourinary Health

Maintaining kidney function is very important in the elder. Avoid giving medications that are harmful to the kidney, and use fluids to flush more harmful medications (such as dyes used in radiologic studies) out through the kidneys. Dehydration should also be avoided.

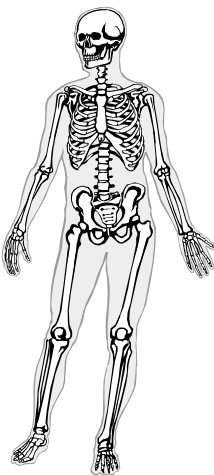
Assess the elder for BPH by asking if he has difficulty voiding, what positions he has found helpful to void, and if patient voids in small amounts. Urologic evaluation may be helpful in determining if BPH is a problem that could affect the kidneys via back pressure.

Asking questions of a sexual nature is difficult for many health care providers. Answering those same questions may be even more difficult for the elder. Ensure that you have privacy and have built a rapport with the elder before asking questions about sexuality.

Musculoskeletal system

With age, the mass and density of bone is lost. Post-menopausal women are especially at risk for bone loss. The bones lose calcium and other minerals through “demineralization”.

As a result of the bone mass loss, the trunk shortens. The vertebrae also lose mass, causing each bone to thin, curve, and compress. There is inappropriate deposition of the calcium, which may cause bone



spurs on the vertebrae or other bones.

Other bones, such as the scapulae, become porous from bone loss to the extent that they look “moth eaten” on x-ray. Although the long bones of the arms and legs lose mass and become brittle, they do not change their length. This results in the arms and legs looking inappropriately long in relation to the body.

Beyond bone demineralization, there are degenerative changes in the joints from loss of structure, loss of cartilage, thickening of bones and loss of fluid in the joints. Calcium may be deposited in the hip, knee, and shoulder joints, causing bone spurs. Fingers may become deformed, particularly in women.



The muscle mass of the body also changes. Muscle loss begins in the 20’s for men and the 40’s for women and will result in a loss of 20-25% of the total muscle mass by the age of 70. The muscle itself may become rigid and non-compliant, even with continued exercise. Muscle fibers may shrink and be replaced with a tough tissue, causing parts of the body, especially the hands, to appear thin and bony.

Maintaining Musculoskeletal Health

This is the amazing thing – exercise will bring back lean muscle and bone density, even if started at a late date! In a recent study, thirty 90 year olds were started on an eight-week course of exercise. At the end of the study, there was an average increase in lean muscle mass of 174%. Exercises such as walking, running, and weight-lifting all put stress on the bone that will increase mineral deposition in the bone.

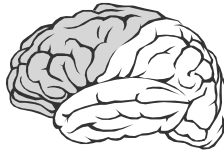
To prevent bone loss, post-menopausal women should consume 1200-1500 mg of calcium a day. Hormonal supplementation is also a potential therapy, though there is a higher risk of breast cancer related to hormone replacement.

Nervous system

The organ system failure that many elders fear the most is of the nervous system. Fear of Alzheimer’s and dementia is huge for the older population.

Research has shown that the number of nerve cells decreases with age, but there seems to be some proliferation of dendrites to compensate for the loss (sort of like collateral circulation in the heart). This is a list of the cognitive functions that don't appear to change with aging:

- Attention
- Language
- Visual-spatial ability
- General intelligence
- Conceptualization
- Short term memory



Long term memory, however, does change, starting in the 40's, as does the ability to reproduce figures in three dimensions and abstraction. Reaction times increase, particularly with a more complex processing problem.

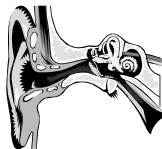
Maintaining Neurological Health

Although the research is scant, there is some anecdotal evidence that continued “cognitive exercise” may be helpful in maintaining cognitive function. Cognitive exercising includes reading, using senses to identify new things, avoiding habitual behavior (i.e., changing the route of a walk, or changing the routine of getting supper), and starting new activities.

Sensory organs

Of all of the organ systems, age related dysfunction of the senses may prove the most difficult of all for the elder to deal with.

Hearing loss is common in the aging adult. The term for hearing loss is presbycusis, and is characterized by loss of high frequency sounds in both ears. The ears also provide for the sense of balance – structural changes associated with aging can cause the elder to be less steady and balanced.



Changes in the eye include a gradual loss of visual acuity, decrease in the amount of tears, intolerance to bright lights, or difficulty in seeing in the dark. Older individuals also have a harder time distinguishing blue from green. Loss of peripheral vision is common, as is the incidence of “floaters,” or shiny

sparkles in the eye caused by changes in the fluid inside the eye.

Although it is not a “normal” part of aging, many older adults have poor dentition, which can make eating a challenge.

Taste and smell may be mildly affected, causing some decrease in the ability to taste and enjoy foods, especially after the age of 75.



The senses related to touch, heat, and cold may also be diminished related to age. This puts the elder at increased risk for injury, as they are not as likely to notice if they have cut or bruised themselves, burned themselves with a heating pad or too hot of water, or gotten frostbite from being outside in the cold.

Balance, as regulated by the ears, also can be affected by age. Changes in the sense of balance, added to vision changes and decreased reaction time, can lead to a big fall.

Maintaining Sensory Function

There are many ways to maintain or even improve sensory function in the elder. Getting glasses (including bifocals or trifocals), after a thorough examination, is one of the most common ways. Older adults may have to relinquish driving at night, and may need to wear specialty sunglasses during bright days (winter and summer). Some elders find it helpful to have a red light on in a hallway or bathroom to see by rather than a white light, as the red light does not have so much glare.

When talking with elders with hearing loss, make sure that the amount of environmental noise is at a minimum. Don't SHOUT! Shouting raises the pitch of your voice, making it even harder for the elder to hear. Look straight at the elder, speak in a normal voice, and avoid putting your hands near your mouth or eating while talking, as many elders use lip reading.

Encourage elders to add seasonings other than salt to improve the taste of their food. Herbs and herbal mixes can add variety to food that may taste bland.

To limit injury, encourage the elder to:

- Turn down the hot water heater to 120 degrees F.
- Avoid hot water bottles or heating blankets.

- Wear protective garments in the cold, especially over hands, feet, and ears.
- Remove all “throw” rugs and items that can clutter the floor.

Hormonal and endocrine systems

The first endocrine organ we tend to think of is the pancreas with its role of regulating sugar. Although the jury is out as to whether it is a normal change or not, many elders have problems with glucose regulation. It is common for elders to have post-prandial hypoglycemia and it is also common for them to have insulin resistance, causing hyperglycemia.

A normal change of aging is the gradual elevation of the fasting glucose level of 6 – 14 mg/dl per decade after age 50.

Many of the other hormones remain constant in production and level, such as thyrotropin (TSH), but the target organs don’t respond as well to them.

The hormones that decrease with age are estradiol and estrogen in women after menopause, aldosterone, renin, calcitonin, and growth hormone.

All in all, changes in the hormones puts the elder more at risk for osteoporosis (parathyroid hormone, calcitonin, growth hormone), dehydration and hypotension (aldosterone and renin), and cardiovascular disease (estrogen and estradiol).

Maintaining Hormonal Efficiency

The effects from changes in glucose metabolism can be lessened by eating a healthy diet on a regular basis. Many elders do better by eating several small meals a day, rather than two to three large ones.

The impact of hormonal changes that lead to osteoporosis can be lessened by consuming calcium and using weight bearing exercises, such as jogging, walking, or weight lifting.

Encourage the elder to keep track of how much fluid he/she is consuming to keep the fluid balance on track. When the elder goes from a laying to a sitting or standing position, watch for postural hypotension. Encourage the elder to sit for a few minutes until the dizziness fades.

There is research that indicates the hormonal replacement for women will lessen the risk of heart disease after menopause, as well as helping to maintain bone density and strength. Hormonal replacement therapy (HRT) is implicated in a higher risk of breast cancer, though, which may be a risk the elder woman is not willing to take.

Immune system

Everyone knows that the older adult is more at risk for infection than the younger adult, but why? With aging, there is a decrease in the function of the “T”



cells, which help to either directly kill the pathogen or stimulate other immune cells to do so. The “B” cells, primarily responsible for making antibodies, also show a decline in function.

Beyond the T and B cells, there is a definite decrease in the speed of recognition of a pathogen, production of white blood cells, and wound healing. All of these problems make it more likely that the elder will get an infection, become sick, and heal more slowly. Autoimmune disorders may occur as the cells of the body don’t seem to recognize each other as well.

Preventing Infection

Prevention of infection is the key for the elder! Encourage the elder to receive flu and pneumonia vaccines, and to stay away from individuals who are sick. During outbreak times, the elder who is at risk may need to stay away from social activities where others may be sick, such as community dinners.

Maintaining a good nutritional status will also help to decrease the incidence of infection.

Psychological and Social Changes

“How old would you be if you didn’t know how old you was ?” -Satchel Paige

The American Psychological Association (APA) developed a list of myths and facts surrounding the psychological and social parts of a senior’s life³:

Myth: Most older people are pretty much alike.

Fact: They are a very diverse age group.

Myth: They are generally alone and lonely.

Fact: Most older adults maintain close contact with family.

Myth: They are sick, frail, & dependent on others.

Fact: Most older people live independently.

Myth: They are often cognitively impaired.

Fact: For most older adults, if there is decline in some intellectual abilities, it is not severe enough to cause problems in daily living.

Myth: They are depressed.

Fact: Community dwelling older adults have lower rates of diagnosable depression than younger adults.

Myth: They become more difficult and rigid with advancing years.

Fact: Personality remains relatively consistent throughout the lifespan.

Myth: They barely cope with the inevitable declines associated with aging.

Fact: Most older people successfully adjust to the challenges of aging.

What Practitioners Should Know About Working With Older Adults, Norman Abeles, PhD, American Psychological Association, 1998.

Most of the psychological and social issues that arise are a result of disease or disability. Many elders find their own way to interact with society, by:

- Becoming very active in society – community and world-wide
- Continuing to be as active as in previous years
- Interacting with groups
- Withdrawing from society as they have known it
- Adapting to events that have taken place in the social setting

Summary

There are a great many changes that happen in a healthy elder – even more when the older person has a single pathology, or more! Knowing what the “usual” changes are, though, can cue you to knowing when the changes, signs, and symptoms that you see are not normal and should be investigated further. Regardless of whether the change is normal or not, there are interventions that we can undertake to help elders maintain or improve their way of life.

References and Interesting Stuff

The Baltimore Longitudinal Study of Aging has studied what happens to the human body in the absence of disease in research that was begun in 1958.

The American Psychiatric Association has a whole section of information dedicated to mental health in the elderly. Find their web site at: <http://www.apa.org/pi/aging/practitioners.pdf>

For a fun set of activities to show people what the elder faces in terms of changes and disabilities related to age, go to the University of Illinois Extension website at www.urbanext.uiuc.edu For the “Walk In My Shoes” program.

The National Library of Medicine, part of the National Institutes of Health, has a website through Medline which details some of the changes associated with aging. The website is: www.nlm.nih.gov/medline/enc

The National Institute for Aging conducts research and has information available on aging, including the program “In Search of the Secrets of Aging”. Look at 222.nia.nih.gov/health/pubs/secrets-of-aging/index.htm

The American Association of Retired Persons (AARP) has many resources available for the senior. Find them at www.aarp.com.

There are a number of articles on aging found through http://cpmcnet.columbia.edu/dept/dental/Dental_Educational_Software/Gerontology_and_Geriatric_Dentistry/introduction.html. on the normal aspects of aging.

¹ Encarta® World English Dictionary [North American Edition] © & (P) 2001 Microsoft Corporation. All rights reserved. Developed for Microsoft by Bloomsbury Publishing Plc

² Source: Social Security Administrations website at www.ssa.gov/history/lifeexpect.html

³ What Practitioners Should Know About Working With Older Adults, Norman Abeles, PhD, American Psychological Association, 1998. Originally published in *Professional Psychology: Research and Practice* (1998), 29 (5), 413-427.

Recommended Reading

1. American Nurses Association. *Scope and Standards of Gerontological Nursing Practice*, 2nd ed. Washington, DC: ANA, 2001.
2. Ebersole P, Hess P. *Geriatric Nursing & Healthy Aging*, St. Louis: Mosby, 2001.
3. Eliopoulos C. *Manual of Gerontologic Nursing*, 5th ed. Philadelphia: Lippincott, 2001.
4. Fulmer T, Foreman MD, Walker M, eds. *Critical Care Nursing of the Elderly*, 2nd ed. New York: Springer Publishing Co.; 2001.
5. Hogstel MO, Zembruski CD, Wallace M. *Gerontology: Nursing: Care of the Older Adult*. Albany NY: Delmar, 2001.
6. Lueckenotte A. *Gerontologic Nursing*, 2nd ed. St. Louis: Mosby, 2000.
7. Maas ML, Buckwalter KC, Hardy MA et al. (eds.). *Nursing Care of Older Adults: Diagnosis, Outcomes, and Interventions*. St. Louis: Mosby, 2001.

Directions for Submitting Your Post Test for Contact Hours

To obtain a certificate of completion for this home study program, please complete the post-test and evaluation on the next few pages. The date on your certificate of completion will be the date that your home study is received. **Any materials received with a postmark after the expiration will be discarded.**

HealthEast, HCMC, & MVAMC Employees

If you are an employee of HealthEast, HCMC, or MVAMC, you may send the post-test and evaluation to TCHP for processing. Your post-test will be returned to you through your hospital. It cannot be mailed to your home.

Paid Participants

If you are not an employee of one of the TCHP hospitals, please send the post-test and evaluation to TCHP with a check for \$6.00. Please make check payable to **TCHP Education Consortium** and mail to:

**TCHP Education Consortium
Capitol Office Building
525 Park Street, Suite 120
St. Paul, MN 55103**

Your post-test will be returned to you with the certificate of completion.

Changes in Healthy Aging Post-Test

Please print all information clearly and sign the verification statement:

Name _____
(please print legal name above)

Birth date (required)

Format: 01/03/1999

M	M	D	D	Y	Y	Y	Y

For HealthEast, HCMC, or MVAMC, employees only:

Hospital _____ Unit _____

Personal verification of successful completion of this educational activity (required):

I verify that I have read this home study and have completed the post-test and evaluation.

Signature

- 1) Oxygen-free radicals are formed from:
 - a) Exposure to lead or mercury
 - b) Cellular metabolism of oxygen containing food
 - c) Cigarette smoking
 - d) All of the above
- 2) Which of the following is not an anti-oxidant?
 - a) Vitamin C
 - b) Selenium
 - c) Vitamin K
 - d) Glutathione
- 3) Is it a normal part of aging to have more fat deposition around the waist and less in the extremities?
 - a) Yes
 - b) No
- 4) Which of the following measures is helpful in decreased the risk of heart attack in the elder?
 - a) Aerobic exercise
 - b) Controlling cholesterol
 - c) Stopping smoking
 - d) All of the above
- 5) Seniors should be discouraged from talking, as talking will injure the larynx.
 - a) True
 - b) False
- 6) Which of the following problems is not part of normal aging?
 - a) Diminished alcohol metabolism
 - b) Diminished benzodiazepine metabolism
 - c) Increased incidence of gallstones
 - d) Less gastric acid secretion
- 7) Maintaining safety in the face of sensory loss might include using a red hall light, removing rugs, and getting bifocals or trifocals.
 - a) True
 - b) False
- 8) What percentage of functional nephrons are lost by the age of 80?
 - a) 10-20%
 - b) 20-30%
 - c) 30-40%
 - d) 40-50%
- 9) How much calcium should a post-menopausal woman ingest per day to prevent bone demineralization?
 - a) 500 mg
 - b) 1000 mg
 - c) 1500 mg
 - d) 2000 mg

Expiration date: The last day that post tests will be accepted for this edition is **December 31, 2017**—your envelope must be postmarked on or before that day.

Evaluation: Changes of Healthy Aging

Please complete the evaluation form below by placing an "X" in the box that best fits your evaluation of this educational activity. Completion of this form is required to successfully complete the activity and be awarded contact hours.

At the end of this home study program, I am able to:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Identify the physical, psychological, and social changes that may occur in a healthy elder.					
2. Describe activities and interventions that will help seniors maintain a healthy, active lifestyle.					
3. The teaching / learning resources were effective. <i>If not, please comment:</i>					

The following were disclosed in writing prior to, or at the start of, this educational activity (please refer to the first 2 pages of the booklet).		
	Yes	No
4. Notice of requirements for successful completion, including purpose and objectives		
5. Conflict of interest		
6. Disclosure of relevant financial relationships and mechanism to identify and resolve conflicts of interest		
7. Sponsorship or commercial support		
8. Non-endorsement of products		
9. Off-label use		
10. Expiration Date for Awarding Contact Hours		
11. Did you, as a participant, notice any bias in this educational activity that was not previously disclosed? <i>If yes, please describe the nature of the bias:</i>		

12. How long did it take you to read this home study and complete the post test and evaluation:
 _____ hours and _____ minutes.

13. Did you feel that the number of contact hours offered for this educational activity was appropriate for the amount of time you spent on it?
 ___ Yes
 ___ No, more contact hours should have been offered
 ___ No, fewer contact hours should have been offered

Expiration date: December 31, 2017