

Growing Older: Sensory Changes

The efficiency of the sensory organs—vision, hearing, taste, smell, and touch—declines with age, but the age of onset and the rate of decline differ markedly among people. A sensory change can affect an older person in a number of ways. Changes can be made in the environment to ease a person's adjustment. This publication is addressed to those who care for the elderly—to explain the sensory changes older people encounter and to suggest what you can do to help.

What is it like to hear only a mumbling voice when someone speaks to you? How does it feel to have poor vision and no longer be able to read a newspaper or book? Why do some older people complain that food doesn't taste as good as it did when they were younger?

As people age, they experience changes in the sensitivity of their senses—vision, hearing, taste, smell, and touch. Although most older people function very well, such changes affect daily living. They may mean reduced mobility, increased dependence on others, inaccurate perception of the physical and social environment, reduced ability to communicate with others, frustration, difficulty in accomplishing tasks or not being able to do them at all, and not feeling good about oneself.

All of us should recognize that age-related sensory changes occur, in varying degrees, but if you have elderly family members or if you work with elderly persons it is especially important to understand the changes that are likely. If you lack knowledge and understanding, you may find yourself becoming frustrated easily, setting unrealistic expectations, or mistakenly labeling an older person—particularly the hearing impaired—as “senile,” “confused,” or “failing.” Understanding these changes should increase your ability to provide positive support and to make changes in the environment that enhance the life of an older person. You probably will find yourself focusing more on what a person can do and less on what the individual cannot do.

What are the sensory changes commonly associated with growing older? What do these changes mean to the older adult and to you?

Changes in Sensory Organ Function

The sensory receptors become less efficient with age; therefore, older adults generally require higher levels of stimulation if their sensory receptors are to perform with a sharpness nearer that of younger people. Age, however, is not the only factor causing deterioration of the sensory organs. Disease and environmental factors are also important. Intense and prolonged noise affects hearing, smoking often reduces taste and smell sensitivity, and accidents may injure the eyes.

The changes in vision and hearing are particularly important because they affect not only the person's ability to function in the physical environment, but also may create isolation.



A Pacific Northwest Extension Publication

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Vision

The majority of older adults have good to adequate vision, but several aspects of vision do change with age. These changes include decreased visual acuity (sharpness), farsightedness, changes in color perception, decreased sensitivity to light, and decreased ability to adapt to glare.

Acuity

The most common change is a decrease in the ability of the eyes to see as clearly as when the person was younger. Visual acuity is generally at its maximum in the late teens, remains fairly constant until age 45-50, and then gradually declines. The Center for Health Statistics reports that by age 65, one-half of all people have a visual acuity of 20/70 (what can be seen at 20 feet, a person with perfect vision can see from 70 feet) or less, while fewer than 10 per cent of people 45 and younger have vision poorer than 20/70. In a survey by the National Optometric Association, one-third of those older than 65 reported that an inability to see well prevented them from doing things they wanted to do. More than half of all the severe visual impairments occur in people 65 and older.

Farsightedness (Presbyopia)

With age, the lens of the eye diminishes in its ability to see close objects. This change often becomes noticeable during the 40's and 50's, when it is not unusual to hear people say, "My arms must be growing shorter, I can't hold the paper far enough away to read it." Although bifocal lenses help, many older people still find it difficult to see small details, such as the hole of a needle, directions on medications, or numbers in a telephone directory.

Color perception

Several studies suggest that the lens of the eye yellows with age and filters out colors at the blue end of the light spectrum. As a result, an elderly person may not be able to discriminate between shades of blues and between blues, greens, and violets. For example, a 90-year-old nursing home resident could not see the blue flowers in a bouquet because the blue blended into the green leaves. An older person's outfit of different shades of blue may look poorly coordinated to a younger person, but to the older individual the colors may look the same. It is important not to interpret an inability to identify colors as a sign of confusion. Colors more easily distinguished by older adults are the yellows, oranges, and reds. For both pleasure and safety, these colors should be kept in mind when developing printed materials and painting or redecorating the environments of older adults.

Decreased sensitivity to light and increased sensitivity to glare

The eye decreases in its ability to adapt to changes in light level. An older person entering or leaving a darkened room usually requires more time to adjust to the changes in light levels than a younger person. Abrupt changes can be hazardous and cause falls or other accidents. Night lights in bedrooms and bathrooms and a consistent light level in both bedrooms and hallways help prevent accidents. Many older people prefer daylight driving because they experience momentary blindness and glare at night from lights of oncoming traffic and reflections from wet pavement.

Increasing age usually is accompanied by increasing dependence on good lighting to see effectively. Brightness of illumination usually must be increased 50 per cent at age 50, 100 per cent more at age 60, and another 33 per cent at age 80 to achieve the levels of visual sharpness, contrast, and reading speed present at age 20. In poor lighting, an older person may not see potential hazards or recognize familiar people.

When increasing light levels, distribute the light evenly and minimize glare. Older adults experience an exaggerated amount of glare from an intense light source. Glare that is hardly noticeable to a younger person may create difficulties for the older person. Shiny surfaces that produce glare need to be avoided in planning an environment.

Other age-related eye changes

Older people often experience cataracts, glaucoma, and macular degeneration. Cataracts are the most common disability. The lens of the eye changes from clear and transparent to cloudy and opaque resulting in distorted vision. It is said that everyone would develop cataracts eventually if they lived long enough. Surgery is nearly always successful in correcting visual losses caused by cataracts.

Glaucoma is less common, but is more serious than cataracts and can cause blindness. Glaucoma is caused by an abnormally high pressure in the eye, a condition created when the fluid that bathes and nourishes the eye cannot drain out of the eye and places pressure on the optic nerve. It is the "sneak thief of sight" because there are few early symptoms. If undiagnosed and untreated, glaucoma eventually can lead to blindness. Today early diagnosis and treatment can slow or prevent much of the vision loss. Preventive care is vital. Simple, painless checks for glaucoma should be performed annually on people past age 50. Persons with a family history of glaucoma should be particularly concerned with annual checkups. Glaucoma is usually treated easily and effectively with medication. Minor surgery to allow fluid drainage is sometimes necessary.

Nearly 30 per cent of the aged have some degree of macular degeneration, a condition that

not properly conducted to the inner ear. All sounds seem muffled. The cause may be an obstruction in the outer ear—an accumulation of wax, or a blockage caused by swelling and pus—but, more often it is a problem in the middle ear.

In sensory-neural loss, the sound waves reach the inner ear, but are not properly converted into a message that can be passed on to the brain. The sensory-neural loss associated with the aging process is called "*presbycusis*." The person with presbycusis generally hears low-pitched tones, but the high-frequency sounds of speech are distorted. The vowels, such as "a," "e," "i," "o," and "u" are low-pitched sounds; the consonants, such as "th," "s," "sh," "f," and "p" are high-pitched sounds and more difficult to hear. As a result, the person has difficulty discriminating between words that sound similar and consequently has difficulty following a conversation. For example, to a person with presbycusis, fifty and fifteen cents may sound the same. The individual may hear "dead" when you say "bed"; "choose" instead of "juice"; or "fill" for "pill." High-tone loss is universal in old age, but there are marked differences in the degree of loss.

Reactions to hearing loss

Many older people are not aware of the degree of their hearing loss, particularly if the loss has been gradual. Others have difficulty admitting they have a hearing loss, particularly if they equate hearing loss with inadequacy.

Persons with hearing impairments may:

- Speak unusually loudly or softly; their voice may sound monotonous or have an unusual quality.
- Accuse others of mumbling and not speaking clearly.
- Position their head to facilitate hearing.
- Ask a speaker to repeat what has been said.
- Fail to follow directions or to respond to sudden sounds or verbal messages.
- Give inappropriate responses to questions.
- Withdraw from social participation and become increasingly isolated.
- Be distracted easily. Attention span often becomes shorter and the individual usually requires more time to respond to verbal messages and other stimuli.
- Display paranoid behavior, being suspicious of others and what they are saying.

It is important for you to recognize that such behaviors may indicate a hearing loss. Too often, older hard-of-hearing persons who appear confused or give inappropriate responses are labeled as "senile," "stubborn," "dull," "bizarre," and the

hearing loss is not diagnosed. The older adult with a hearing loss should be referred to a physician who specializes in hearing problems (otologist/otolaryngologist) and can identify any medical problems and then to an audiologist or speech and hearing clinic for an audiological examination.

Hearing aids

An audiological examination will determine if a hearing aid can help and to what extent. A hearing aid seldom restores normal hearing and it cannot help some hearing losses. Some evidence suggests that older persons are less likely to obtain satisfaction from hearing aids than other age groups.

Although a hearing aid often enhances social participation, many older persons find hearing aids annoying, because not only is the sound of the human voice increased, but *all* sounds are amplified. Sounds may be heard that have not been heard in years.

A period of adjustment is required to learn to use a hearing aid. Sometimes family members and others who work with older adults make a mistake of encouraging older people to wear their hearing aids initially at the wrong times—for example, in noisy situations such as the dinner table when everyone is talking and pots and silverware are clanging. The loudness of so many new sounds may be disturbing and make it difficult to learn to discriminate speech with the hearing aid. Wearing an aid for only a short time (15 to 60 minutes) during a quiet time of the day and gradually increasing the time over a month to 10 to 12 hours a day makes the adjustment easier. It is important to take proper care of a hearing aid to ensure its effectiveness.

The proper fitting of a hearing aid may require several visits to an audiologist for adjustment of the sound range being amplified. Patience and practice will result in a hearing aid becoming a real tool in restoring communication.

What can you do to help?

Communication skills which are often helpful include the following:

- Speak clearly in a moderate voice.
- Do not shout. Shouting creates a booming effect and makes it even more difficult to hear. Shouting only accentuates the vowel sounds and obscures the consonants. This is especially true when speaking to someone with a hearing aid.
- Lower the tone of your voice, particularly if it is high pitched.
- Get the attention of the hard-of-hearing person before speaking.
- Face the hard-of-hearing person directly and on the same level whenever possible. Keep hands

away from face. Many hard-of-hearing rely partially on lipreading to get a message. For the person with both a vision and hearing problem, communication problems are increased.

- Position yourself so that light is shining from above or toward you, rather than from behind into the eyes of the hard-of-hearing.
- Use facial expressions, gestures, and objects to further illustrate the verbal message.
- Speak slowly and distinctly, but do not exaggerate lips. Overarticulation distorts the mouth and what is being said.
- Remove objects from your mouth when speaking, for example, gum, cigarettes, and food.
- Allow longer intervals between sentences. It often takes the older, hearing-impaired person longer to absorb and understand a message.
- Decrease background noises when talking with the hearing-impaired. Turn off the radio and television.
- When giving important instructions to the severely hearing-impaired, write them down as well as give them orally.
- If a person has greater loss in one ear than in the other, direct your conversation toward the "good" ear.
- If a person has difficulty understanding what is being said, use different phrases with similar meaning.
- Try to become aware of acoustical problems in the room or area, and make adjustments to improve speech perception by the hard-of-hearing.
- Keep your voice at about the same volume throughout a sentence.
- Ask the hard-of-hearing person what you can do to help understanding.

When playing music for hard-of-hearing older people, adjust the sound system so lower tones are predominant. Organ music is often popular because of the richness of the lower tones.

Taste

Food that tastes and smells good is important in maintaining a good level of nutrition. However, with increasing age the senses of taste and smell decline and can affect the pleasure and satisfaction older people obtain from food. The number and sensitivity of the taste buds decrease, but these changes usually do not seriously affect taste sensitivity until the seventh decade of life.

Most people over the age of 65 have lost 50 percent of their taste buds. By the late 70's, the average person has one-sixth of the taste buds of a 20-year-old.

Factors other than age, such as smoking and poor mouth and dental hygiene, also affect ability to taste foods.

After the age of 50, the ability to perceive the four taste sensations—sweet, salty, bitter, and sour—decline, but not at the same rate. Studies indicate the taste receptors that identify sweet and salty flavors are the first to atrophy, while those that sense bitter and sour flavors tend to function well into old age.

The older person who has experienced changes in his ability to taste food may reminisce about how much tastier food was when he was young, implying that foods were different and better then. He may quit eating because "nothing tastes good" or he may eat excessively attempting to achieve some taste sensation. A common complaint is that "the food just doesn't taste right," or "this food tastes sour or bitter." As a result, an older adult may put excessive amounts of sugar, salt, or seasoning on his food, which may ruin the flavor of food for a younger person.

Older people who have poor vision and have lost their taste sensitivity often find it difficult to identify foods. Food may have little appeal to them. Diet restrictions, for example bland or low-salt diets, can contribute further to the undesirability of food. Poor health, low physical energy, not wanting to prepare a meal for just one person, and limited budgets also contribute to some older people not eating well.

To encourage eating, food should be prepared and served attractively. Distinctive and varied textures, colors, and temperatures add to the identification and enjoyment of food. Food may need to be more highly spiced. The older person who chews food well and switches from food to food when eating obtains more taste from food, and hence more enjoyment from a meal.

If the person needs assistance with feeding, avoid mixing foods together because such mixing makes it impossible for the individual to separate flavors. Encourage good dental and mouth hygiene.

Smell

Many older people have difficulty identifying common foods and environmental substances by smell. The exact mechanism for this decline is not known; however, studies indicate the sense of smell may be the earliest sensory system to decline with age, beginning as early as the late thirties or early forties.

Because two-thirds of the taste sensations depend on the ability to smell, decline in the smell system may further depress an older person's appetite or interest in food. Loss in the ability to smell may mean an individual can no longer smell body or household odors that may be offensive to others. Warning odors—smoke, gas, or spoiled

causes loss of central vision. Peripheral or side vision is not affected. The macula, an area 3/16 of an inch diameter in the retina, enables us to see fine details. When the macula is damaged, the person is able to get around by himself particularly in familiar surroundings, but often is unable to read, enjoy television, or identify people until they are close. Low-vision aids help a person to use remaining vision more effectively and efficiently. Treatment is largely concerned with prevention or slowing the progress of the disease by medical treatment.

Although most older people will have some loss of vision, many retain near-normal vision well into their seventies and eighties. However, persons with losses in vision may experience decreasing mobility, poor orientation, and frightening visual impressions that resemble hallucinations. Reading, watching television, and other pastimes may be reduced or eliminated. Older adults also generally feel more vulnerable to danger and crime when handicapped by vision and other sensory losses.

What can you do to help?

What can you do to help the visually impaired function more effectively in their environment? Techniques, in addition to those previously discussed, include the following:

- Use good contrast between the background and lettering of printed materials. Paper should have a dull finish and large lettering should be used.
- Obtain large-print books or "talking" books for the severely visual impaired who enjoy reading. Information about such books is available from state and local libraries.
- Use contrasting colors, for example, between doorways and walls, dishes and tablecloth, and the risers and flat surfaces of steps.
- Use coding schemes, for example, color or dots of glue at different points on oven and washing machine dials can make different dial settings easier to find and, consequently, enhance independent living.
- Simplify the visual field and avoid clutter, but don't change the location of objects without the person knowing about it.
- Give pre-warnings when approaching or moving the visually impaired. Otherwise, you may unintentionally frighten the person. Let the individual know what you are going to do. This gives advance information about actions and helps the person to feel more secure.
- Use touch to enhance communication. Holding or patting someone's hand can tell the person where you are and that you are listening and have not walked away while the individual is talking.

- When entering a new environment with a visually impaired person, explain the people present, and their location.

- When walking, let the visually impaired person take your arm just above the elbow. You will be walking a half step ahead. The person can better anticipate your movements and generally feels more secure than if you grab his arm.

Hearing

Hearing loss is potentially the most serious of the sensory impairments. Unlike poor vision, hearing loss rarely inspires sympathetic understanding. The seeing eye dog, thick glasses, and white cane all help us to identify the blind and visually impaired, but the hard-of-hearing and deaf are not as visible. In regard to her deafness, Helen Keller stated:

"I am just as deaf as I am blind. The problems of deafness are deeper and more complex, if not more important than those of blindness. Deafness is a much worse misfortune. For it means the loss of the most vital stimulus—the sound of the voice that brings language, sets thoughts astir, and keeps us in the intellectual company of man —"

Hearing loss affects more people than any other chronic condition. From age 20 to 60, the rate of hearing impairments rises from 10 to 75 per 1,000 population. Between the ages of 60 and 80, the rate increases to 250/1,000 population. Approximately 30 to 50 per cent of all older people suffer a significant hearing loss that affects their communication and relationships with others. Older men usually have a greater hearing loss than older women. This is probably due to the fact that more men have worked in noisy jobs.

Hearing loss can lead to other problems. It can cause isolation, anxiety, and depression. Even a slight loss can be emotionally upsetting, particularly if it interferes with correctly understanding the television, family, and friends. Many people will withdraw from group situations when it becomes a chore to listen and to follow rapid topic changes in conversation. Travel by public transportation can be difficult, particularly if announcements over the intercoms are unclear. Furthermore, loss of hearing often occurs at a time when a person is adjusting to other age-related losses, including perhaps death of friends and loved ones. A hearing loss may complicate adjustment.

Types of hearing loss

The two general categories of hearing loss in the later years are conductive loss and sensory-neural loss. With conductive loss, sound waves are

foods—may be undetectable. Smoke alarms and pilot lights can decrease the potential hazards that loss of smell creates—especially for persons living alone.

Adding artificial odors to food is one method of improving food flavor for some older persons. For example, artificial green bean odor can be added to green beans and artificial potato odor and flavor added to potatoes. Adding such odors will not be helpful to older adults who have completely lost their sense of smell, but may help some older people enjoy their food more. Artificial odors are manufactured by several companies, including Furmenich, 277 Park Avenue, New York, N.Y. 10017, and International Flavors and Fragrances, 1515 Highway 36, Union Beach, N.J. 07735. The companies may be able to direct you to local distributors or sources. The Extension Service lists these addresses as a service, and does not endorse these products over others that may be available.

Foods with artificial odors added may be aversive to young people or others who do not need them.

Touch

Although research is limited, studies suggest an age-related decline in the sensory system of touch. Skin sensitivity and the ability to detect pain decreases. It becomes more difficult for the person to distinguish textures and objects on the basis of touch alone. A person may not recognize he is being touched or may have a delayed reaction.

Pain threshold increases. As a result, an older adult is more likely to be burned or cut and not know it until severe damage has occurred. The hot temperature of bath water or a heating pad, for example, may not be readily felt. An older person also is less likely to perceive internal body pain or a rising temperature as early as a younger individual. This may result in an illness progressing to an advanced stage before detection. This is par-

ticularly common and potentially dangerous in the older diabetic. Because diabetes contributes to loss of nerve sensitivity and blood flow in the feet and legs, severe cuts and bruises may not be noticed and severe infection may result.

For all persons over 70, precautions such as lowering the temperature of a hot water heater help to reduce the likelihood of accidents due to decreased touch and pain sensitivity.

The use of touch can be a powerful therapeutic tool. Yet, evidence suggests that many older adults are touched very little or not at all and suffer from "touch hunger." Touching has a number of advantages. It is a powerful means of communication, it can help make up for loss in other senses, reduce anxiety, and provide comfort. However, when using touch, it is important to consider the older person's background, culture, and sense of private space. A simple handshake or pat on the back can communicate warmth and respect to the older person.

Your Attitude is Important

When working with sensory-impaired older people, keep in mind that personality, life-style, and family and friends affect their adjustment. Many compensate well for their losses. Others may use their loss as a means of getting attention. Those who are proud—and afraid of losing their independence—may refuse help. Your attitude and response toward the old and the handicapped is a key to being an effective helper. Try to avoid distorting a single handicap into a total handicap, and treating the older handicapped individual with a patronizing attitude. Instead, be helpful, while enhancing the elderly person's feelings of adequacy and self-esteem.

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PNW 196

MARCH 1980

Published and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914, by the Cooperative Extension Services of the University of Idaho, James L. Graves, director; Washington State University, J. O. Young, director; Oregon State University, Henry A. Wadsworth, director; and the U. S. Department of Agriculture, cooperating. Extension programs are available to all people without regard to race, creed, color, sex, or national origin.