

Meeting Safety Needs of Older Adults

Objectives

1. Discuss the types and extent of safety problems experienced by the aging population.
2. Describe internal and external factors that increase safety risks for older adults.
3. Discuss interventions that promote safety for older adults.
4. Discuss factors that place older adults at risk for imbalanced thermoregulation.
5. Describe those older adults who are most at risk for developing problems related to imbalanced thermoregulation.
6. Identify signs and symptoms of thermoregulatory problems.
7. Identify interventions that assist older adults in maintaining normal body temperature.

Key Terms

heatstroke (HĒT-strōk) (p. 174)

hyperthermia (hī-pĕr-THĒR-mĕ-ă) (p. 174)

hypothermia (hī-pō-THĒR-mĕ-ă) (p. 173)

thermoregulation (thĕr-mō-RĒG-ŭ-lā-shŭn) (p. 173)

Safety is a major concern when working with or providing care to older adults. Although older adults compose approximately 11% of the population, they account for approximately 23% of accidental deaths. A report from the National Safety Council reveals that approximately 24,000 people older than 65 years die from accidental injuries each year, and at least 800,000 sustain injuries serious enough to disable them for at least 1 day.

Falls, burns, poisoning, and automobile accidents are the most common safety problems among older adults. Exposure to temperature extremes also places older adults at risk for injury or death. Older adults are more susceptible to accidents and injuries than are younger adults because of internal and external factors. Internal factors include the normal physiologic changes with aging, increased incidence of chronic disease, increased use of medications, and cognitive or emotional changes. External factors include a variety of environmental factors that present hazards to older adults.

INTERNAL RISK FACTORS

Vision and hearing are protective senses. When the acuteness of the senses diminishes with aging, the risk for injury increases. Vision and hearing changes are common with aging. Diminished range of peripheral vision and changes in depth perception are common and can interfere with the ability of older adults to judge the distance and height of stairs and curbs or to determine the position and speed of motor vehicles. Night vision diminishes. In dim light or glare, older adults may be unable to see that a curb, step, or other

hazard is present. They may be unable to see or read stationary road signs that provide directions or warnings. Falls or motor vehicle accidents often result from altered vision.

Changes in visual acuity make it more difficult to read labels with small print. This can make it difficult for older adults to read the directions on prescriptions. Many older adults have taken incorrect medications or wrong doses or have even consumed poisonous substances because they could not see adequately to read the labels.

Decreased auditory acuity reduces an older person's ability to detect and respond appropriately to warning calls, whistles, or alarms. For example, older adults may not hear a warning call of impending danger, may not hear a motor vehicle or siren in time to avoid an accident, or may not respond to a fire alarm in time to leave a building safely.

The senses of smell and taste also help protect us from consuming substances that might be harmful to the body. Decreased sensitivity of these senses increases the risk for accidental food or chemical poisoning in the elderly population.

Older adults often experience one or more physiologic changes that increase their risk for falls and other accidental injuries. Any of these changes alone or in combination can reduce the older person's ability to respond quickly enough to prevent an accidental injury. When these problems are combined with chronic diseases or health problems, the risk increases dramatically. Common physiologic changes that affect safety include the following:

- Altered balance
- Decreased mobility

- Decreased flexibility
- Decreased muscle strength
- Slowed reaction time
- Gait changes
- Difficulty lifting the feet
- Altered sense of balance
- Postural changes

Conditions affecting the cardiovascular, nervous, and musculoskeletal systems are most likely to contribute to safety problems. Any cardiovascular condition that results in decreased cardiac output and decreased oxygen supply to the brain can cause older adults to experience vertigo (dizziness) or syncope (fainting). Common disorders with this result include anemia, heart block, and orthostatic hypotension. Studies have shown that approximately 52% of long-term nursing home residents older than 60 years experience four or more episodes of orthostatic hypotension a day.

Older persons with neurologic disorders such as Parkinson's disease or stroke experience weakness and alterations in gait and balance that increase the risk for falls. Neurologic and circulatory changes can also decrease the ability to sense painful stimuli or temperature changes, increasing the risk for tissue injuries, burns, and frostbite. A study has shown that nursing home residents with diabetes are more than twice as likely to suffer from falls as those who do not have diabetes.

Musculoskeletal conditions such as arthritis further reduce joint mobility and flexibility, decreasing the ability of the older person to move and respond to hazards and intensifying the likelihood of accidents or injury. Box 9-1 lists injury risks for older adults.

Medications often contribute to falls, and, because older adults commonly take one or more medications, their risk for untoward effects is increased. Any medication that alters sensation or perception, slows reaction time, or causes orthostatic hypotension is potentially dangerous for older adults. Common types of hazardous medications include sedatives, hypnotics, tranquilizers, diuretics, antihypertensives, and antihistamines. Alcohol, although not a prescription medication, acts as a drug in the body. Alcoholic beverages, particularly in combination with prescription drugs, increase the risk for falls and other injuries. More information regarding safe use of medications is included in Chapter 7.

Box 9-1 Injury Risks for Older Adults

- Impaired physical mobility
- Sensory deficits
- Lack of knowledge of health practices or safety precautions
- Hazardous environment
- History of accidents or injuries

Cognitive changes or emotional disturbance and depression may be overlooked as risk factors for falls or injury. These disturbances reduce the older person's ability to recognize and process information. Distracted or preoccupied older adults are less likely to pay full attention to what is happening or what they are doing. This lack of attention and caution increases the risk for accidents and injury.

FALLS

Falls are the most common safety problems in older adults. Consider the following statistical facts revealed in the literature:

1. One-third to one-half of people older than age 65 are prone to falling.
2. Any fall is the best predictor of future falls. Two-thirds of those who have experienced one fall will fall again within 6 months.
3. The older a person becomes, the more likely he or she is to suffer serious consequences, such as a hip fracture, from a fall.
4. Falls are a leading death caused by injury in people older than age 65 and number one for men over 80 and women over 75.
5. Approximately one-fourth of older adults who experience falls will die within a year and another 50% will never return to their previous level of independence or mobility.
6. The incidence of falls is higher among those residing in long-term care facilities than among those who live independently in the community.
7. The number of hip fractures due to falls is projected to exceed 500,000 per year in 2040.
8. The cost to Medicare and Medicaid will climb dramatically as the elderly population increases. Direct costs related to falls are expected to exceed \$32 billion by 2020.

These statistics were dramatic enough that the federal government enacted the *Elder Fall Prevention Act of 2003* to develop a national initiative intended to reduce falls. This act was designed to fund research, promote public education, and provide services proven to reduce or prevent elder falls. In 2009 and 2010, additional legislation designed to reduce the number of falls among older adults was passed. Legislation requiring training on fall prevention for long-term care workers also has been implemented.

Many independent elderly are reluctant to report a fall because of the implication that they are frail and dependent. In addition to causing bodily harm, falls take a psychological toll on the elderly, causing them to lose confidence and decrease mobility. This is unfortunate because early recognition and interventions can reduce the risk for further falls. Studies have shown that supervised exercise focusing on balance, gait, and strength may be of help, as will environmental modifications. Older adults living independently in

the community often do not recognize hazards in their home environment because they are too accustomed to their surroundings to view them as potential hazards. The elderly and their family members need to be aware of things they can do to reduce the risk for falls. Some helpful approaches are summarized in Box 9-2.

Fall prevention is everyone's responsibility. Outreach sessions about fall prevention designed to meet the needs of elderly adults, their families, and anyone who has contact with elderly adults could be offered at senior centers, libraries, businesses, and community colleges. Health care settings need to maintain current and complete policies and procedures for fall prevention, new employee training regarding fall prevention, a method for prompt reporting and investigation of all falls, and scheduled multidisciplinary meetings to identify problems and plan interventions.



Coordinated Care Collaboration

Fall Prevention

Nursing assistants often have good insights into the reasons for a fall. The nurse could ask the CNA for a few suggestions for actions that might help prevent a future fall. These ideas could then be included in the plan of care. Ownership of the idea is likely to improve compliance with the plan. Make sure that the nursing staff and all other departments take fall prevention seriously. Report the presence of any unsafe conditions, no matter how minor they seem. Notify housekeeping, maintenance, or security promptly and then verify that the problem has been corrected. Another strategy is "Catch me doing something right." Too often we are quick to blame someone when a fall occurs. It is a far better practice to praise the staff when you see call lights being answered promptly, spills being mopped up, and proper footwear or assistive devices being used. Some literature even suggests identification of a "Falls Champion"—a staff member who has additional training regarding fall prevention who can then provide training to others, act as a mentor to new staff, and keep a high awareness of the need for fall prevention.

Box 9-2 Reducing the Risk for Falls

- *Prepare safe surroundings.* Make sure you have adequate lighting, particularly in stairwells. Keep frequently needed items such as the telephone, tissues, etc., on a table near your chair or bedside. Avoid placing items on the floor, particularly near your favorite chair or bedside. Make sure there are no throw rugs, uneven floors, electric wires, oxygen tubing, or other items that could cause tripping. Mop up spills in the kitchen or bathroom immediately. Do not climb on anything other than an approved step stool to reach high places.
- *Allow adequate time to complete an activity or task.* Haste increases the risk for falls or other injuries. If you feel dizzy or lightheaded, sit for a while before standing.
- *Wear proper-fitting footwear.* Shoes with nonslip soles and low heels are recommended because high-heeled shoes contribute to balance problems. Shoes should have closures that are easy to manipulate. If shoes have laces, check that they do not come loose and cause tripping. Loose-fitting slippers or shoes can drop off the foot and lead to a fall.
- *Use assistive devices if needed.* A cane or walker provides security by enlarging the base of support. These devices should be kept close at hand to avoid leaning or reaching. The tips should have solid rubber grips to prevent slipping and may need to be modified on icy surfaces to promote gripping.
- *Ask for help when necessary.* This Bible passage provides good advice: "Pride goeth before destruction, and a haughty spirit before a fall." Failure to seek help can lead to serious injury. Older adults should be encouraged to recognize that good judgment is a sign of healthy aging and not a sign of weakness.



Cultural Considerations

Home Fall Risk Among Chinese Older Adults

A study designed to identify risk factors for falls in the homes of elderly adults residing in China revealed data that are very similar to those found in the United States. In China, falls are identified as the second leading cause of accidental death. As with Americans, many elderly Chinese do not recognize safety hazards because they have lived with them for a long time. Risk areas and hazards in China and the United States are almost identical. Tai chi chuan, an exercise designed to maintain balance, is a common daily practice among the elderly in China. The benefits of this exercise for fall reduction are being researched in the United States.

EXTERNAL RISK FACTORS

Environmental hazards include everything that surrounds older adults. Potential hazards are presented by the people and the variety of objects a person comes into contact with on a daily basis. Even the climate in which a person lives can present an environmental hazard. Environmental hazards are everywhere: in the home, on the street, in public buildings, and in health care settings. Box 9-3 lists tips on preventing injuries in the home. Although injuries can and do occur often in the home, a change in environment, such as hospitalization, travel, or any other move from a familiar environment, increases the likelihood of injury for older adults.

FIRE HAZARDS

Older adults are among the highest risk groups for injury or death due to fire. Hospitals and long-term care facilities are well aware of the danger of fire. Building codes for these institutions require safety doors, fire extinguishers, exit windows, oxygen precautions, and other safety measures. Each institution should have a fire safety plan designed to reduce the risk for fire, a quick notification system to the local fire department, protocols for fire containment, and an evacuation plan. Fortunately, these measures have made institutional

Box 9-3 Preventing Injuries in the Home

- *Ensure that all rugs are firmly fixed to the floor.* Tack down loose edges, ensure that rubber skid-proofing is secure, and remove decorative scatter rugs.
- *Maintain electric safety.* Check regularly to ensure that there are no broken or frayed electric cords or plugs. Any defective electric plug or cord should be repaired by an approved repair person. Discard all electric appliances that cannot be repaired. Install ground fault interrupt (GFI) electric sockets near water sources to prevent accidental shocks when appliances are used.
- *Decrease clutter and other hazards.* Throw out unnecessary items such as old newspapers. Keep shoes, wastebaskets, and electric or telephone cords out of traffic areas. Never place or store anything on stairs. Ice should be cleared promptly from sidewalks and outside staircases. Cat litter can be used to provide traction on icy surfaces.
- *Provide adequate lighting.* This is particularly important in stairwells. Switches should be located at both the top and bottom of stairs. Use night-lights in the bedroom, bathroom, and hallways. The kitchen should have adequate lighting in food preparation areas to facilitate label reading and to reduce the risk for injury when sharp objects are used.
- *Provide grip assistance wherever appropriate.* Handrails should be installed in all stairwells to provide support for stair climbing. Grab bars alongside the toilet and in the bathtub and shower also help provide support. Lightweight cooking utensils with large handles and enlarged stove knobs make cooking easier and safer for older adults.
- *Place frequently used items at shoulder height or lower where they can be reached easily.* Keeping frequently used items available decreases the need to use climbing devices. Use only approved devices such as step stools when reaching for items that cannot be reached easily. Ladders are not recommended for use by older adults, but if they are used, ensure that they are fully open and locked. Excessive reaching should be avoided, and another person should stand by to steady the ladder, reducing the risk for tipping.
- *Take measures to prevent burns.* Avoid smoking or the use of open flames whenever possible. Do not wear loose, long sleeves when cooking on a gas stove. Check that the hot water tank setting does not exceed 120° F. Use a mixer valve to prevent sudden bursts of hot water. Have a plan for leaving the residence in case of fire.

fires an uncommon occurrence. Fires in the community are another story. Studies show that over 1200 Americans over age 65 die each year as a result of fires. Residential fires injure an average of 3000 older adults each year. Most of the injuries are a result of cooking accidents, whereas the majority of the deaths are smoking-related. Many of these deaths could be prevented by instituting these basic fire safety precautions in the home:

- Make sure smoke detectors are installed. Check that the batteries are working and replace them twice a year. Do not disable the device if cooking fumes or steam causes it to sound. Instead, move the device or try a different type of detector.
- Use caution with cigarettes or open flames. Do not leave them unattended or on an unstable surface where they could fall onto flammable floors or furniture. Empty all smoking materials into a metal container so no smoldering materials can combust. NEVER smoke in bed.
- Make sure there are no open flames from cigarettes, matches, candles, etc., if oxygen is in use. Oxygen does not burn, but it supports the combustion of other flammable items.
- Check extension cords for fraying or loose plugs. Do not pull cords out by tugging on the wire. Be careful not to overload an outlet. Avoid using extension cords; get an electrical block with a circuit breaker instead.
- Be sure to turn off the stove or oven if you are leaving the area. Keep baking soda and a pot lid available to smother a fire if it occurs. *Do not* use water, particularly if grease is involved.

- Never cook while wearing long, loose sleeves that could catch fire, causing serious burns.
- If you live in a rental unit, report any fire safety hazards such as blocked exits, cluttered hallways, or other problems to the owner or management promptly. If these problems are not resolved, notify the fire department.
- Have an escape plan. Plan more than one escape route if possible. Practice how you would get out, particularly if you use a wheelchair or other mobility aids. Keep a flashlight, eyeglasses, and a whistle (to warn others or to help them find you) at the bedside. If the fire is in your residence, get out to safety before calling the fire department. Close the door behind you to prevent the spread of the fire. **DO NOT** try to fight the fire yourself.
- **DO NOT** use elevators when there is a fire.

HOME SECURITY

People, particularly strangers, present a risk to the elderly. Older adults are more vulnerable than younger persons to attack and injury from those who prey on weaker or more defenseless people, such as the infirm or elderly. Older adults need to be aware of the risks presented by strangers and learn to institute measures to reduce the likelihood of injury (Box 9-4).

VEHICULAR ACCIDENTS

Probably the most dangerous hazards, because of their size and speed, are motor vehicles. Motor vehicle accidents are more likely to occur with aging, whether the older person is a pedestrian or a driver.

Box 9-4 Home Security Guidelines

- *Think and plan ahead to reduce risks to personal safety.* Unfortunately, we live in a society that is less safe than the one in which older adults grew up. Precautions that may not have been necessary in the past should now be part of each person's daily planning.
- *Identify ways an intruder could enter the home.* Defective locks on windows or doors should be replaced. Locks should be secured and checked each time the person enters and leaves. Lost or stolen keys may necessitate lock changes.
- *Maintain regular contact with friends and family.* Daily phone calls or some sort of signaling system should be used to indicate that everything is all right.
- *Use the telephone safely.* Keep a phone at the bedside and near the favorite sitting area. This eliminates the need to hurry to another room. If possible, obtain a phone with large numbers, which enables accurate dialing in a stressful situation. An autodial function with emergency numbers is also helpful. An answering machine is useful in screening unwanted or late-night calls. Women living alone should never broadcast this fact to strangers. Using a male voice on the answering machine is a wise precaution.
- *Answer the door safely.* Ensure that doors are secure with a peephole at eye level for viewing visitors before opening the door. Make sure that outside lighting is available and working so that nighttime visitors can be observed. Ask for proper identification before opening the door for a stranger. Do not open the door if there is any doubt about who is there; authentic sales agents or service employees will wait and not be offended by having their identification checked with their company.
- *Bank safely.* Withdraw cash in small-denomination bills. Do not carry or display large amounts of cash. Secure money immediately in a wallet, money belt, or handbag. It is wise not to put large sums of money in a shoulder or strap handbag that can be pulled away easily. It is better to keep wallets in an internal pocket or body pouch. Keep large amounts of cash and valuables in a bank or other financial institution. Vary the day and time that banking is done. When using an automated teller machine, avoid nighttime visits and whenever possible, have another person along for safety.
- *Prepare for emergencies.* Have emergency numbers posted in large, clear lettering near each telephone. If entry door locks have dead bolts, they should be left unlocked with the key in place while the older person is inside. This reduces the risk of the older person being trapped in the building in case of fire and enables emergency care providers to enter the housing unit if services are needed.

Studies reveal facts that demonstrate the magnitude of the problem. Crossing roads is a significant problem for elderly pedestrians. One study revealed that only 1% of independent persons older than 72 years were able to cross a street before the traffic signal changed. Although the incidence of pedestrian accidents is low, the risk for serious injury is great. Some communities with high numbers of elderly have adopted modifications that make street crossing safer. These include pedestrian-controlled timers, safety islands, and restrictions on vehicle turns at intersections. Active lobbying by seniors in other communities could help initiate some of these safety innovations.

Older adults are often unwilling to stop driving in spite of the serious risks to themselves and others. Independence is the main reason voiced by elderly adults for continued driving. A driver's license is a ticket to freedom. From adolescence on, Americans' preferred method of transportation is the car. In some parts of the country, driving seems to be more a necessity than a luxury. Rural and suburban areas may not have viable alternatives other than reliance on another person to provide transportation. Currently, there are few legal measures in place to determine when an older adult's driving privileges should be terminated, but many proposals are being discussed in states all across the country. This is a difficult issue, often pitting younger family members against aging parents. Not infrequently, health care providers are caught in the middle of the dilemma.

Driving by the elderly is a major concern in communities in which large numbers of senior citizens reside. In 2003, 7541 people age 65 and older died in motor vehicle crashes, and it is estimated that approximately 200,000 were treated for motor vehicle accidents. While these numbers include both passengers and drivers, the issue of older drivers is increasingly in the news and the issue will only get larger as the Baby Boom generation ages. Drivers over age 65 have the highest crash rate per mile driven. By 2020 more than 40 million drivers will be over age 65. The number of drivers over age 70 is expected to triple in the next 10 years. Although it has not been shown that older drivers pose a greater risk for injury or death to others, they themselves are more likely to die from injuries sustained in a motor vehicle accident than are younger drivers. The fatality rate for drivers over age 85 is nine times higher than for drivers 25 to 69 years of age, based on a mile-for-mile basis.

Several factors contribute to these statistics. Age-related vision changes result in altered depth perception, changes in night vision, and diminished ability to recover from glare. Hearing changes can interfere with the ability to recognize sirens or other auditory warnings. Decreased muscle strength, reduced flexibility, and slower reflexes reduce the ability to respond to hazards while controlling a motor vehicle. Other medical conditions or medications may also have effects on driving ability. One of the growing risk factors is related to changes in cognitive functioning, particularly due to Alzheimer's disease. Estimates indicate

that between 30% and 45% of people with early Alzheimer's disease continue to drive. Only six states (California, Delaware, Nevada, New Jersey, Oregon, and Pennsylvania) require the physician to report mental impairment.

The National Motorists Association takes the position that changes in understanding, judgment, and memory pose a greater threat on the roads than do physical changes. Yet advocates for Alzheimer's victims often recommend limiting rather than terminating driving privileges.

Baby Boomers are a large segment of the automobile market. As this group ages, automakers are adapting their vehicles to be more friendly to older adults while still marketing a stylish image to entice Baby Boomers to buy their cars. Modifications include larger numbers on the instrument panel, easier-to-grip handles, adjustable pedal height, back-up sensors, higher and wider bucket seats, and many other features. Senior citizens are encouraged to ask auto dealers about which "senior-friendly" features or options are available.

Although people are usually aware of the need to modify activity levels as they age, older adults may not be equally aware of the need to make adjustments in driving. Initiating safe driving modifications can enable older adults to enjoy the freedom of movement provided by automobiles while protecting themselves and others (Box 9-5). Sometimes these adjustments are not enough, and the difficult decision to stop driving must be made. Warning signs that indicate a person should stop driving include, but are not limited to, the following:

- Nervousness or lack of comfort behind the wheel
- Difficulty staying in one lane

Box 9-5 Safe Driving Practices for Older Adults

DO

- Plan ahead to know where you are going
- Add extra time so that you do not feel rushed
- Limit your driving to places close to home and easy to get to
- Avoid distractions such as talking, playing the radio, or using a cell phone
- Wear your seat belt at all times
- Wear appropriate eyeglasses and hearing aids
- Pace trips to allow for frequent rest breaks
- Use extra caution when approaching intersections
- Drive at a safe distance behind other cars

AVOID DRIVING

- If taking medications that affect driving skills
- During rush hour
- At night, when lighting is limited, or during inclement weather
- On busy streets and in congested traffic areas
- On limited-access roads with high speed limits and complex intersections such as freeways

- More "near misses"
- More dents or scrapes on the car (or hitting or scraping the garage, mailbox, etc.)
- Other drivers "honking" at you more often
- Friends or family not wanting to ride with you
- Confusing the brake and gas pedals
- Difficulty turning to look over your shoulder when backing up
- Medical conditions or medications that affect your ability to maneuver the car
- Being easily distracted or having difficulty concentrating while driving
- Getting lost more often
- Receiving more warnings or traffic tickets

When older adults stop driving, they need alternative means of getting around. Family and friends are often more than willing to provide transportation. Volunteers from churches or civic agencies may also provide rides for senior citizens. Some communities provide low-cost bus or taxi services. The local Agency on Aging can provide information regarding services that are available in a particular area. Often elderly clients complain that alternative transportation is too costly. This can be countered by statistics that estimate the yearly cost of owning and operating a car at about \$6000 per year. That amount will pay for quite a bit of alternative transportation.

THERMAL HAZARDS

Another external factor that presents risks to older adults is extremes in environmental climate. Older persons in extreme conditions (temperatures below 60° F or above 90° F) are at increased risk for developing problems related to thermoregulation (Box 9-6). It is estimated that 10% of all persons older than age 65 have some thermoregulating defect that puts them at risk. Older persons who are sick, frail, inactive, or taking medications such as sedatives, tranquilizers, antidepressants, and cardiovascular drugs that prevent the body from regulating temperature normally are at serious risk when exposed to even minor climate changes.

Box 9-6 Thermoregulation Risks for Older Adults

- Exposure to excessively cold or hot environments
- Limited financial resources to pay for heat or clothing that is suitable for environmental temperature
- Neurologic, endocrine, or cardiovascular disease
- Hypometabolic or hypermetabolic disorders (diabetes, cancer, hypothyroidism, hyperthyroidism, malnutrition, obesity)
- Infection or other febrile illness
- Dehydration or electrolyte imbalances
- Inactivity or excessive activity
- Temperature-altering medications (alcohol, antidepressants, barbiturates, reserpine, benzodiazepines, phenothiazines, anticholinergics)

Even active, healthy older persons are at increased risk when exposed to extremely hot or cold temperatures.



Home Health Considerations

Hypothermia and Hyperthermia

As the cost of heat increases, older adults may try to save money by lowering their thermostat setting. This can be dangerous because a drop in environmental temperature below 65° F can result in hypothermia for elderly persons in their eighties and nineties. Likewise, air-conditioning costs are considerable, and many elderly adults may be reluctant to use it even when available. The National Institute on Aging offers free “Age Pages” that provide information on how to avoid hypothermia and hyperthermia. This information can be obtained online (www.nia.nih.gov) or by phone (800-222-2225). The National Energy Assistance Referral (NEAR) Program can help seniors pay their heating bills. NEAR phone operators (800-674-6327) will give callers the number to reach their state Low-Income Home Energy Assistance Program (LIHEAP) office, as well as referrals to local agencies that offer assistance with paying energy bills.

Thermoregulation, the ability to maintain body temperature in a safe range, is controlled by the hypothalamus. The normal core body temperature is maintained between 97° F and 99° F. Body temperature can be affected by a wide range of internal and external factors. Internal factors include muscle activity, peripheral circulation, amount of subcutaneous fat, metabolic rate, amount and type of foods and fluids ingested, medications, and disease processes. External factors include humidity, environmental temperature, air movement, and amount and type of clothing or covering.

Heat is produced by metabolic processes and by muscular activity such as shivering and conserved by vasoconstriction. Heat is lost through vasodilation and perspiration. Anything that changes the balance of heat lost and heat retained can cause problems.

Hypothermia is defined as a core body temperature of 95° F or lower. Older adults are highly susceptible to hypothermia for several reasons. Normal changes that occur with aging affect the body’s ability to regulate temperature. Changes in the skin reduce the older person’s ability to perceive dangerously hot or cold environments. Decreased muscle tissue, decreased muscle activity, diminished peripheral circulation, reduced subcutaneous fat, and decreased metabolic rate affect the amount of heat produced and retained by the body. As a person ages, metabolism slows, activity decreases, and shivering diminishes. When the older person is exposed to low environmental temperatures, body temperature drops further. These changes further decrease activity and heat production and allow the body temperature to decrease even further. If this cycle is not stopped, the person may die. The National Institute on Aging estimates that more

than 2.5 million older adults are at risk for hypothermia, and the Centers for Disease Control and Prevention reports that approximately 700 deaths per year were attributed to exposure to excessive cold.

Disease processes such as hypothyroidism, hypoglycemia, and malnutrition can also cause a decrease in heat production. Medications that decrease environmental awareness, such as barbiturates, tranquilizers, and antidepressants, can increase the risk for hypothermia. Alcohol ingestion is highly dangerous because it decreases environmental awareness and, at the same time, increases vasodilation with resulting heat loss.

While decreased body temperature is the major symptom of hypothermia, an older person may manifest other signs or symptoms (Box 9-7). One of the first signs of hypothermia in older adults is growing mental confusion that can progress from simple memory loss or changes in logical thinking to total disorientation. Pulse and respiratory rate slow with hypothermia and may be difficult to detect in severe cases. The skin becomes cool or cold to the touch, and pallor or cyanosis is often present (particularly on the extremities). The face may appear swollen or puffy. Muscles appear to be stiff, and fine tremors may occur. Changes in coordination, including poor balance or gait changes, are common. Behavior changes such as lethargy or apathy may occur, but irritability, hostility, and aggression are also possible responses. Shivering, an indication that the body is having difficulty maintaining adequate body temperature, may or may not be evident in older adults, because this response often diminishes or disappears with aging. Because many of the signs and symptoms of hypothermia are similar to those of other disorders in older adults, they can easily be missed or mistaken for something else. The National Institutes of Health suggests an assessment of the “umbles”—mumbles, stumbles, fumbles, and grumbles—to look for possible indications of hypothermia.

With proper precautions, hypothermia is preventable. Approaches to prevention are identified in the nursing interventions section later in the chapter.

Box 9-7 Signs of Hypothermia

- Mental confusion
- Decreased pulse and respiratory rate
- Decreased body temperature
- Cool/cold skin
- Pallor or cyanosis
- Swollen or puffy face
- Muscle stiffness
- Fine tremors
- Altered coordination
- Changes in gait and balance
- Lethargy, apathy, irritability, hostility, or aggression

When hypothermia is suspected, immediate intervention is necessary to prevent serious complications or death. If the elderly person is unconscious, call 911; special care will be required to prevent cardiovascular complications and to rewarm the person. This should be done even when the person appears to be dead because a pulse may not be palpable as a result of severe vasoconstriction. If the person is conscious, get him or her out of the cold and into a warmer environment. Remove cold and/or wet clothing and wrap the person with blankets or other insulating coverings. Warm blankets may be used, but avoid heating pads, electric blankets, or immersion in a hot bath because these may cause cardiovascular problems and cause damage to fragile skin. Warm, not hot, beverages are appropriate and beneficial if the person is able to drink.

Hyperthermia, a higher than normal body temperature, occurs when the body is unable to get rid of excess heat. Deaths directly or indirectly caused by hypothermia average about 700 per year in the United States. Men die from hyperthermia about twice as often as women. Of these deaths, 40% occur in adults over age 65. Hyperthermia can be caused by excessively high environmental temperatures, an inability to dissipate heat, or increased heat production due to exercise, infection, or hyperthyroidism.

Many parts of the country experience extremely high temperature during summer months. When this heat is combined with high humidity, the normal cooling mechanisms of the body are ineffective. Even under moderate conditions, it takes longer for older adults to begin sweating, and, because of diminished thirst and decreased body water, they produce less perspiration. These factors render older adults more likely to develop heat exhaustion and heatstroke.

Hyperthermia can place a significant strain on the heart and blood vessels of older adults. Cardiovascular problems and heat are a deadly combination. Endocrine problems such as diabetes and psychiatric disorders also increase the risk for hyperthermia. Medications commonly used by the elderly can compromise the body's normal adaptation to heat. Diuretic medications prevent the body from storing fluids and can diminish superficial vasodilation. Anticholinergic medication used to treat Parkinson's disease (e.g., benztropine and trihexyphenidyl) can interfere with perspiration as does a wide range of psychotropic medications. Consumption of alcohol should be avoided because it can decrease awareness of symptoms and contribute to fluid loss.

Symptoms of hyperthermia are progressive. Mild, early signs of heat stress include feeling hot, listless, or uncomfortable. Cramps in the legs, arms, and abdomen are early indicators of elevated body temperature. Indications of a serious heat-related problem may include hot, dry skin without perspiration; tachycardia; chest pain; breathing problems; throbbing headache; dizziness;

profound weakness; mental or perceptual changes; vomiting; abdominal cramps; nausea; and diarrhea.

Heat exhaustion occurs gradually and is caused by water or sodium depletion. Both active and inactive older adults can develop heat exhaustion if they do not consume adequate fluids and electrolytes when exposed to hot environments. If heat exhaustion is not recognized and treated, it can progress to a more severe condition called *heatstroke*.

Heatstroke, a condition in which the body temperature can climb as high as 104° F, is a life-threatening emergency. Heatstroke is a very real concern for active older persons, particularly those living in hot climates. Strategies that can prevent or reduce the incidence of hyperthermia are listed under Nursing Interventions in each of the Nursing Process sections that follow.

SUMMARY

Psychological trauma caused by falls, assaults, motor vehicle accidents, fires, thermal events, or other injuries can be more serious than the physical trauma itself. Fear of injury often confines older adults to their homes and can cause them to lose confidence in their ability to perform even simple actions. They may restrict their activity, thereby contributing to further loss of strength, decreased mobility, social isolation, and increased dependence. If too much function is lost, institutionalization may be necessary.

❖ NURSING PROCESS FOR RISK FOR INJURY

■ Assessment/Data Collection

- Does the person have a history of falls or other injuries?
- If yes, how often has the person fallen? When and where did the fall occur? What types of injuries are most common?
- How often does the person suffer injuries?
- What is the person's level of vision? Hearing? Temperature perception?
- Does the person have any impairment in gait or balance?
- Does the person use any assistive devices such as a cane, walker, etc?
- What kind of footwear does the person wear most often?
- Does the person suffer from any cognitive impairment?
- Is the person forgetful?
- Does the person smoke? Light candles in the home? Use a gas stove?
- Does the home have a smoke detector? Is it working?
- Does the person live alone?
- What medications does the person take?
- Does the person suffer from dizziness or fainting?
- What are the person's hemoglobin and hematocrit levels?

- Is the person able to follow directions?
- Does the person drive? Does he or she wear a seat belt when riding in a car?
- If living at home, where does the person store medications?
- Where does the person store chemicals and cleaning supplies?
- Are there any safety hazards in the home environment? Scatter rugs? Electric wires? Others?

■ Nursing Diagnoses

Risk for falls, risk for injury, risk for trauma, risk for poisoning

■ Nursing Goals/Outcomes Identification

The nursing goals for an older person at risk for injury, trauma, or poisoning are to experience a decrease in the frequency and severity of injuries and to identify unsafe conditions and behaviors.

■ Nursing Interventions/Implementation

The following nursing interventions for those at risk for injury, trauma, or poisoning should take place in hospitals or extended-care facilities:

1. **Evaluate the person for the risk for falls.** Older individuals who experience dizziness or fainting with position changes are at increased risk for falls. These symptoms are often caused by a sudden drop in blood pressure (orthostatic hypotension). These individuals should be instructed to move slowly and to remain seated until the dizziness passes. Episodes of orthostatic hypotension are more likely to occur early in the morning, particularly before

breakfast, and may be aggravated by dehydration or medications. Episodes of dizziness may have other causes and should be reported to the physician so that the cause can be determined. Evaluate laboratory values for the presence of anemia, which can increase the risk for falls. Be sure to notify the physician of any abnormal values so that appropriate interventions can be initiated. All new admissions should be assessed for problems with balance and gait so that appropriate safety strategies can be initiated.

Older individuals should be encouraged to move at a comfortable pace and not to hurry. Hurrying increases the risk for falling. They should be encouraged to wear comfortable footwear that helps with support and balance. Assistive devices that improve stability by providing a wider base of support (e.g., canes and walkers) may be needed (Figure 9-1).

Check high-risk individuals frequently. The call signal should be readily available whether the person is in bed or in a chair. Lounges and bathrooms should be equipped with call signals. Calls from older adults should be answered promptly. If older adults have to wait too long for assistance, they may attempt to stand or walk even if they know it is unsafe.

Provide adequate assistance based on the patient's abilities and limitations. Use lifts and other transfer devices when appropriate. Care should be taken to prevent injury to both the patient and the caregiver.

2. **Modify the environment to reduce risks.** To prevent falls resulting from visual changes, stairwells should be well illuminated both day and night. The edges of stairs, shower lips, and any other

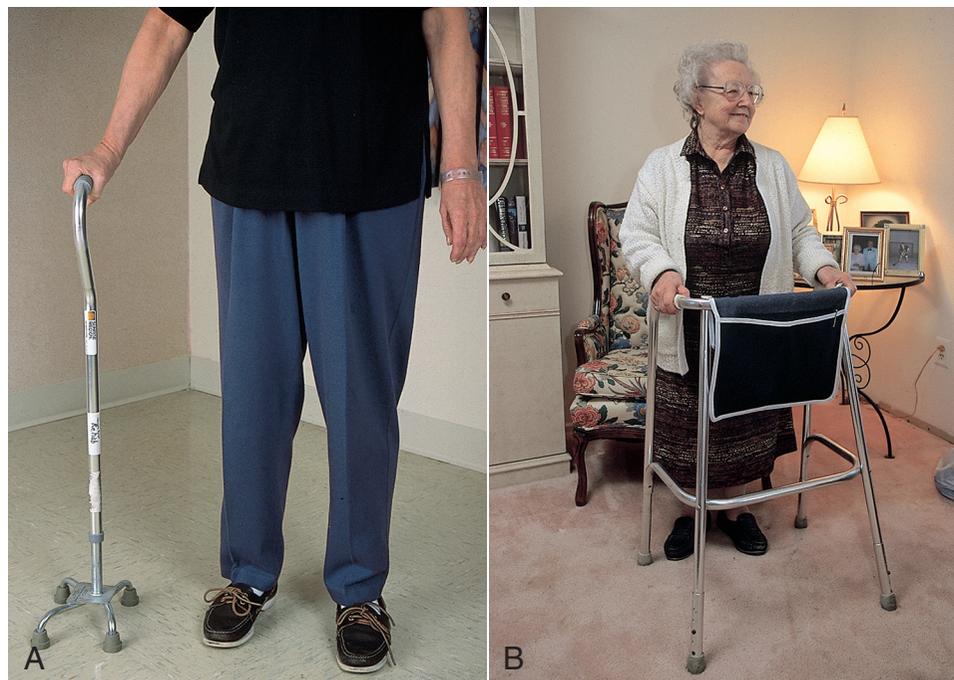


FIGURE 9-1 Assistive devices promote support and safety. **A**, Quad cane. **B**, Walker.



FIGURE 9-2 Handrails provide support when walking.

elevations should be marked using a dark or contrasting color stripe to help the aging individual recognize the edge. Hallways should have strong grip rails to provide support during ambulation (see Figure 9-2). All clutter such as newspapers, wastebaskets, shoes, and other clutter should be removed from the floor. Provide non-skid footwear. Be sure to lock all devices with wheels such as beds and wheelchairs. Use low beds or keep beds in low position unless the caregiver is at the bedside. If the caregiver has to leave the person, even briefly, the bed should be lowered. Whenever the bed is elevated, the side rail opposite the caregiver should be up to reduce the chance of falls. Electronic sensors or alarm systems designed to signal when an at-risk person attempts to stand up from a chair or get out of bed unassisted may be helpful, particularly in cases of cognitive impairment where the elderly person is unaware of the risk for falling.

Medication carts should be locked and properly stored when not in use. Medications should never be left at the bedside unless this is permitted by the physician. Medications intended for one individual can easily be taken by a confused person who wanders into the room. Cleaning carts and supplies should also be locked in a cabinet or closet when not in use (Box 9-8).

Box 9-8 Safety Alert

All poisonous agents, including cleaning solutions, must be stored in locked cabinets or closets where they are out of the reach of residents. Cleaning carts should be kept within sight of staff.

Restraints must be used with caution—and only when there is a documented reason for them and only after the person or his or her guardian agrees to their use (see following Coordinated Care box). This includes use of foot pedals, vest and waist restraints, and even chair tables and safety belts. Omnibus Budget Reconciliation Act (OBRA) regulations are very specific about when and what types of restraints are permitted. Most facilities require a physician's order to use restraints.



Coordinated Care

Collaboration

Use of Restraints

All staff, including nursing assistants, should be thoroughly trained regarding the use of each type of restraining device. Close attention should be paid to when, what, how, and why restraints are used.

- **When:** Restraints should be used only when other less restrictive methods have been tried first and found to be ineffective. Restraints should never be used as a form of punishment. Physician's orders are necessary for both physical and chemical restraints. Informed consent should be obtained from the patient or legal guardian before restraints are used.
- **What:** The least restrictive device that allows the highest level of function but still provides protection should be used. For example, a waist bar or lap board in a wheel chair is likely to be preferable to a full-vest restraint.
- **How:** Read all manufacturers' directions and agency policies before applying a restraint. Use the correct-size device. Make sure to identify the front and back of the device before applying. When the restraint has tie straps, care must be used to attach them to a part of the bed or chair that moves with the patient so that they do not become overly constricting. Use only quick-release hitch knots that are affixed in locations where the nurse, but not the patient, can easily reach them. When restraints are in use, the patient must be checked frequently. Restraints should be released at least every 2 hours, and tissues beneath the restraint must be inspected for signs of altered circulation or other tissue damage.
- **Why:** Inappropriate use of restraints increases the risk for harm to the patient. The potential for lawsuits charging abuse or neglect increases when restraints are in use. To reduce the risk for legal liability, the nurse should document carefully. Documentation must include the following: (1) a baseline assessment of physical condition, including vital signs, infections, pain, fluid and nutritional status, elimination status, medications, vision, hearing, mental status, and typical behavior patterns; (2) information describing specific behaviors that necessitated the need for restraints, including persons or events that may have triggered the behavior; (3) data identifying the type and time the devices were used; (4) the patient's response to restraint; and (5) interventions identified as part of the plan of care designed to prevent recurrences of the need for restraint.

Critical Thinking

Restraints

Identify as many alternatives to using restraints as you can.

- Why do you think that these alternative actions will decrease the need for restraints?
- How many of these actions have you seen used in care settings?
- Have you tried any yourself? How effective was the alternative intervention?

Complementary and Alternative Therapies

Music Therapy

Research has found that older patients who listen to music they enjoy exhibit significantly more positive behaviors while out of restraint than do older patients who are not exposed to music. No single type of music is right for everyone. Family members may be helpful in identifying favorite music, or the staff may try different types of music and observe the patient's response. Some may prefer classical; others like big band; still others love gospel music. Considering the demographics, the music of the Baby Boomers (e.g., Elvis, James Taylor, the Beatles) may soon be what is played.

The following interventions should take place in the home:

1. **Assess the environment for hazards and modify it to reduce the likelihood of injury.** The home environment can be dangerous for older adults. To reduce the likelihood of poisoning, all cleaning supplies should be stored well away from food or medications. If the older person has impaired judgment, it may be necessary to keep all poisonous substances in a locked cabinet or closet. All medications should be labeled clearly in large letters so that individuals can distinguish their names and directions. Check refrigerator for spoiled or outdated food.

Individuals with circulatory changes should be taught the importance of checking the temperature of bath water with a thermometer. They should not add hot water when sitting in a tub or adjust the temperature of the water while in the shower. Use only non-skid shower mats. Any spills should be mopped up promptly to reduce the risk of slipping.

Aging individuals should be discouraged from climbing because falls from higher places are more likely to cause serious injury. In general, chairs, footstools, and other pieces of furniture are unsafe. If the person needs to reach a high area, a good step stool with a broad base of support should be used. Select furniture that is steady and easy to get out of without assistance.

Stairs should be kept free of clutter. Handrails in stairwells should be sturdy and in good repair. Install grip rails in showers, tubs, and around toilets, making sure they are tightly attached to the structure (studs) of the wall not just the plaster.

Make sure there is adequate lighting without glare, particularly in stairwells and bathrooms. Keep a flashlight at the bedside for emergencies or when a light cannot be easily reached. A floor should be checked for hazards such as clutter, scatter rugs, or loose carpet edges that, when rolled up, may trip a person. All hazardous items should be removed or repaired to reduce the risk for falls.

Make sure smoke detectors are installed and that they are working correctly. Change batteries twice a year in the spring and fall when clocks are changed for daylight savings time.

Encourage use of a medical alert, "panic button," emergency call device that is worn as a necklace or bracelet. This can be activated to summon help if a fall occurs. In addition, the person should be assessed for a depressed mood. Studies have shown that the incidence of falls is three times higher among depressed individuals living at home.

2. **Recruit the assistance of a family member or friend to check on the older person at regular intervals.** Regular visits to the home permit a quick check of the most obvious hazards. Any unsafe conditions can be corrected before an injury occurs. The nurse should review the most common concerns with the visitors so that they are more alert and aware. Although frequent checks will not always prevent injury, they can reduce the chance of an injured older person lying helpless for extended periods. Some older persons invest in special call signal devices that can be worn on their bodies. These call signals can be activated in case of emergency to summon help. They should be purchased only after the reputation of the company who sells and services the device has been carefully checked with an agency such as the Better Business Bureau. Many of these so-called safety systems are worthless and provide a false sense of security to older adults.
3. **Use any appropriate interventions that are used in the institutional setting.**

❖ NURSING PROCESS FOR HYPOTHERMIA/HYPERTHERMIA

■ Assessment/Data Collection

- What is the person's body temperature?
- How does it change throughout the day?
- Is the person inactive or excessively active?
- Does the person show any signs of infection, including behavioral changes?
- Does the person complain of feeling hot or cold?
- Does the person have any disease conditions that increase the risk for ineffective thermoregulation?
- Does the person suffer from electrolyte imbalance?
- Does the person consume alcohol or other temperature-altering medications?

- Does the person suffer from dementia, depression, or other conditions that decrease awareness?
- Does the individual have adequate financial resources to pay for housing that has adequate heat and ventilation?
- Does the individual have clothing suitable for the environmental conditions?

See Box 9-6 for a list of thermoregulation risks for older adults.

■ Nursing Diagnoses

Hypothermia, hyperthermia, risk for imbalanced body temperature, ineffective thermoregulation

■ Nursing Goals/Outcomes Identification

The nursing goals for an older person with hypothermia, hyperthermia, imbalanced body temperature, or ineffective thermoregulation are to maintain core body temperature within the normal range and to state the appropriate modifications in dress, activity, and environment needed to maintain body temperature within the normal limits.

■ Nursing Interventions/Implementation

The following nursing interventions should take place in hospitals or extended-care facilities:

1. **Monitor the environmental temperature, humidity, and air movement.** Room temperature should be maintained at a comfortable level between 70° F and 75° F. Relative humidity between 40% and 60% is comfortable for most people. Ventilation should provide an exchange of air without drafts that may cause chilling. Limit the time an elderly person is exposed to extreme temperatures, either hot or cold.
2. **Monitor body temperature at regular intervals.** The temperature of any person at risk for hyperthermia or hypothermia should be monitored regularly. In many cases, a thermometer that registers temperatures below 95° F is needed for accurate measurement. Electronic thermometers or thermal ear sensors provide accurate temperatures when used correctly.
3. **Provide clothing and bed covers that are suitable for the environment.** Extra clothing and blankets may be necessary for inactive persons. Knit undergarments, layered clothing, bed socks, nightcaps, and flannel sheets or blankets are particularly effective at retaining body heat. Make sure to use adequate covers or an adequately warmed room when bathing a frail elderly person. In the summer, clothing should be lightweight, loose, and nonconstricting to allow adequate movement of air over the body.
4. **Promote adequate fluid and food intake.** In cold weather a diet rich in protein and additional snacks can help maintain subcutaneous fat needed for

insulation and promote adequate muscle mass needed to sustain heat production.

In hot weather, older adults should have fresh fluids at the bedside at all times. Pitchers of a cool sugar-free beverage should be available in day rooms, activity centers, and lounges. Because older adults may have a diminished sense of thirst, frequent reminders to drink may be necessary.

5. **Monitor activity level in accordance with environmental temperature.** Increased physical activity helps older adults keep warm in cool weather. Excessive activity should be avoided during hot weather, particularly during daytime hours when heat is greatest.

The following interventions should take place in the home:

1. **Verify that the residence has adequate heat in cold weather and adequate ventilation in hot weather.** Many older adults, particularly those who live alone and those with limited financial resources, live in marginal or substandard housing. There is often inadequate heat to provide warmth in winter or inadequate ventilation to keep cool in the summer. If the home is poorly heated, the person should be encouraged to stay active and dress warmly. If the house is too hot or is poorly ventilated, the person could be encouraged to reduce activity and dress in cool clothing. If air-conditioned public buildings such as shopping plazas, libraries, or senior citizen centers are accessible, older adults should be encouraged to spend the hottest times of day in such facilities.
2. **Identify community resources that can help older adults maintain a safe environment.** Many public utility companies have special programs designed to ensure that older adults have adequate heat in winter. Some also provide fans or air conditioners in the summer. Often these are available to older adults at reduced prices. Special payment plans that spread the cost of heating or air conditioning over the year are also available in most areas of the country. Such plans can enable older adults to budget their limited resources while maintaining a safe thermal environment.
3. **Teach good health habits.**
4. **Use any appropriate interventions that are used in the institutional setting.**

To Prevent Hyperthermia

- (1) Decrease physical activity during the daytime.
- (2) Do heavy chores such as laundry early in the morning or in the evening.
- (3) Perform outdoor activities after sunset.
- (4) Dress in light-colored, loose-fitting cotton clothing.
- (5) Keep out of direct sunlight—use hats, umbrellas, awnings, or other types of sunscreens to reduce sun exposure.
- (6) In excessive heat, take cool baths or showers several times a day, or apply cool,

wet towels or ice packs to the axillae and groin. (7) Drink a minimum of 8 to 10 glasses of water or cool beverages each day regardless of thirst. When there are medical restrictions on fluid intake, the physician should be consulted regarding the recommended amount of intake. (8) Avoid drinking hot beverages and alcohol. (9) Eat several small meals instead of a few large ones.

To Prevent Hypothermia

(1) Keep the heat within the safe temperature range of 70° F to 75° F. (2) Stay active. (3) Wear several layers of clothing rather than one heavy layer. Wool, knits, and flannel are particularly warm. (4) Drink 8 to 10 glasses of fluid daily, including warm beverages. (5) Avoid consuming alcohol. (6) Eat several small, warm meals throughout the day.

Get Ready for the NCLEX® Examination!

Key Points

- The normal physiologic changes of aging, increased incidence of chronic illness, increased use of medications, and sensory or cognitive changes place the aging population at increased risk for injury.
- Risk for injury increases dramatically when older adults are exposed to multiple environmental hazards.
- The most common injuries experienced by older adults include falls, burns, poisoning, and automobile accidents.
- Nurses can play an important role by helping older adults recognize their risk factors, by planning coping strategies to promote safety, and by modifying their environment to minimize the likelihood of injury.

Additional Learning Resources

SG Go to the Study Guide on pp. 382–400 for additional learning activities to help you master the chapter content.

evolve Go to your Evolve website (<http://evolve.elsevier.com/Wold/geriatric>) for the following FREE learning resources:

- Animations
- Answer Guidelines for Nursing Care Plan Critical Thinking Questions
- Answers and Rationales for Review Questions for the NCLEX® Examination
- Glossary with pronunciations in English and Spanish
- Video Clips

Review Questions for the NCLEX® Examination

1. A factor that contributes to the development of hypothermia in older adults is decreased:
 1. Activity level
 2. Sensory perception of cold

3. Percentage of body fat
4. Nutritional and fluid intake

2. Which manifestation(s) indicate(s) serious heat-related problems? (Select all that apply.)

1. Cramps in the legs
2. Vomiting
3. Heavy perspiration
4. Profound weakness
5. Mental changes
6. Throbbing headache

3. The nurse should instruct the nursing assistant who is caring for a client who is receiving antihypertensive medication to:

1. Have at least two people assist with ambulation
2. Allow them to stand up slowly from sitting or lying position
3. Take the blood pressure if they complain of diplopia
4. Provide additional salt with their meals

4. The nurse is aware that the best predictor of an elderly person falling is:

1. A history of previous falls
2. Use of multiple medications
3. Sensory deficits
4. Alterations in balance

5. List three nursing interventions the nurse could implement that would reduce the risk for falls.