

20 - Geriatrics

Chapter 307. Approach to the Geriatric Patient

Introduction

Geriatrics refers to medical care for the elderly, an age group that is not easy to define precisely. "Older people" is sometimes preferred but is equally imprecise; > 65 is the age often used. Gerontology is the study of aging, including biologic, sociologic, and psychologic changes.

Around 1900 in the US, people > 65 accounted for 4% of the population; now, they account for > 13% (38 million, with a net gain of > 1000/day). In 2026, when post-World War II baby boomers begin to reach age 80, estimates suggest that > 20% (almost 80 million) will be > 65. Mean age of those > 65 is now a little more than 75, and the proportion of those > 85 is predicted to increase.

Life expectancy is an additional 16 yr at age 65 and 9 yr at age 75 for men and an additional 19 yr at age 65 and 12 yr at age 75 for women. Overall, women live about 5 yr longer than men, probably because of genetic, biologic, and environmental factors. These differences in survival have not changed, despite changes in women's lifestyle (eg, increased smoking, increased stress).

Changes with Aging

Most age-related biologic functions peak before age 30 and gradually decline linearly thereafter (see [Table 307-1](#)); the decline may be critical during stress, but it usually has little or no effect on daily activities. Therefore, disorders, rather than normal aging, are the primary cause of functional loss during old age. Also, in many cases, the declines that occur with aging may be due at least partly to lifestyle, behavior, diet, and environment and thus can be modified. For example, aerobic exercise can prevent or partially reverse a

[[Table 307-1](#). Selected Physiologic Age-Related Changes]

decline in maximal exercise capacity (O_2 consumption per unit time, or Vo_{2max}), muscle strength, and glucose tolerance in healthy but sedentary older people (see [Sidebar 307-1](#)).

The unmodifiable effects of aging may be less dramatic than thought, and healthier, more vigorous aging may be possible for many people. Today, people > 65 are in better health than their predecessors and remain healthier longer. Because health has improved, decline tends to be most dramatic in the oldest old.

Evaluation of the Elderly Patient

Evaluation of the elderly usually differs from a standard medical evaluation. For elderly patients, especially those who are very old or frail, history-taking and physical examination may have to be done at different times, and physical examination may require 2 sessions because patients become fatigued.

The elderly also have different, often more complicated health care problems, such as multiple disorders, which may require use of many drugs (polypharmacy). Diagnosis may be complicated, resulting in delays or missed diagnoses, and sometimes drugs are used inappropriately. Early detection of problems results in early intervention, which can prevent deterioration and improve quality of life often through relatively minor, inexpensive interventions (eg, lifestyle changes). Thus, some elderly patients, particularly the frail or chronically ill, are best evaluated using a comprehensive geriatric assessment (see p. [3086](#)), which includes evaluation of function and quality of life, often by an interdisciplinary team.

Sidebar 307-1 Exercise

Only about 20 to 25% of the elderly participate in regular exercise for > 30 min 5 times/wk (a common

recommendation). About 35 to 45% participate in minimal exercise. The elderly tend to exercise less than other age groups for many reasons, most commonly because disorders limit their physical activity.

The benefits of exercise for the elderly are many and far exceed its risks (eg, falls, torn ligaments, pulled muscles). Benefits include

- Reduced mortality rates, even for smokers and the obese
- Preservation of skeletal muscle strength, aerobic capacity, and bone density, contributing to mobility and independence
- Reduced risk of obesity
- Prevention and treatment of cardiovascular disorders (including rehabilitation after MI), diabetes, osteoporosis, colon cancer, and psychiatric disorders (especially mood disorders)
- Prevention of falls and fall-related injuries by improving muscle strength, balance, coordination, joint function, and endurance
- Improved functional ability
- Opportunities for social interaction
- Enhanced sense of well-being
- Possibly improved sleep quality

Exercise is one of the few interventions that can restore physiologic capacity after it has been lost.

All elderly patients starting an exercise program should be screened (by interview or questionnaire) to identify those with chronic disorders and to determine an appropriate exercise program (see p. [3295](#)). Exercise is inappropriate for only a few elderly people (eg, those with unstable medical conditions). Whether those with chronic disorders need a complete preexercise medical examination depends on tests that have already been done and on clinical judgment. Some experts recommend such an examination, possibly with an exercise stress test, for patients who have ≥ 2 cardiac risk factors (eg, hypertension, obesity).

Exercise programs may include any combination of 4 types of exercise: endurance, muscle strengthening, balance training (eg, tai chi), and flexibility (see p. [3292](#)). The combination of exercises recommended depends on the patient's medical condition and fitness level. For example, a seated exercise program that uses cuff weights for strength training and repeated movements for endurance training may be useful for patients who have difficulty standing and walking. An aquatics exercise program may be suggested for patients with arthritis. Patients should be able to select activities they enjoy but should be encouraged to include all 4 types of exercise. Of all types of exercise, endurance exercises (eg, walking, cycling, dancing, swimming, low-impact aerobics) have the most well-documented health benefits for the elderly.

Some patients, particularly those with a heart disorder (eg, angina, ≥ 2 MIs), require medical supervision during exercise.

High-intensity muscle-strengthening programs are particularly appropriate for frail or near-frail elderly patients with sarcopenia. For these patients, machines that use air pressure rather than weights are useful because the resistance can be set lower and changed in smaller increments. High-intensity programs are safe even for nursing home residents > 80 ; in them, strength and mobility can be substantially improved. However, these programs are time-consuming because participants usually require close supervision.

Drugs and exercise: Doses of insulin and oral hypoglycemics in diabetics may need to be adjusted (according to the amount of anticipated exercise) to prevent hypoglycemia during exercise. Doses of

drugs that can cause orthostatic hypotension (eg, antidepressants, antihypertensives, hypnotics, anxiolytics, diuretics) may need to be lowered to avoid exacerbation of orthostasis by fluid loss during exercise. For patients taking such drugs, adequate fluid intake is essential during exercise.

Some sedative-hypnotics may reduce physical performance by reducing activity levels or by inhibiting effects on muscles and nerves. These and other psychoactive drugs increase the risk of falls. Stopping such drugs or reducing their dose may be necessary to make exercise safe and to help patients adhere to their exercise regimen.

Multiple disorders: On average, elderly patients have 6 diagnosable disorders, and the primary care physician is often unaware of some of them. A disorder in one organ system can weaken another system, exacerbating the deterioration of both and leading to disability, dependence, and, without intervention, death. Multiple disorders complicate diagnosis and treatment, and effects of the disorders are magnified by social disadvantage (eg, isolation) and poverty (as patients outlive their resources and supportive peers) and by functional and financial problems.

Clinicians should also pay particular attention to certain common geriatric symptoms (eg, acute confusion, dizziness, syncope, falling, mobility problems, weight or appetite loss, urinary incontinence) because they may result from disorders of multiple organ systems.

If patients have multiple disorders, treatments (eg, bed rest, surgery, drugs) must be well integrated; treating one disorder without treating associated disorders may accelerate decline. Also, careful monitoring is needed to avoid iatrogenic consequences. With complete bed rest, elderly patients can lose 5 to 6% of muscle mass and strength each day (causing sarcopenia), and effects of bed rest alone can ultimately result in death.

Missed or delayed diagnosis: Disorders that are common among the elderly are frequently missed, or the diagnosis is delayed. Clinicians should use the history, physical examination, and simple laboratory tests to actively screen elderly patients for disorders that occur only or commonly in the elderly (see [Table 307-2](#)); when diagnosed early, these disorders can often be more easily treated. Early diagnosis frequently depends on the clinician's familiarity with the patient's behavior and history, including mental status. Commonly, the first signs of a physical disorder are mental or emotional. If clinicians are unaware of this possibility and attribute these signs to dementia, diagnosis and treatment can be delayed.

[\[Table 307-2. Disorders Common Among the Elderly\]](#)

Polypharmacy: Prescription and OTC drug use should be reviewed frequently, particularly for drug interactions and use of drugs considered inappropriate for the elderly (see p. [3098](#)). When multiple drugs are used, computer-based management is more efficient.

Caregiver problems: Occasionally, problems of elderly patients are related to neglect or abuse by their caregiver (see p. [3146](#)). Clinicians should consider the possibility of patient abuse and drug abuse by the caregiver if circumstances and findings suggest it. Certain injury patterns are particularly suggestive, including

- Frequent bruising, especially in difficult-to-reach areas (eg, middle of the back)
- Grip bruises of the upper arms
- Bruises of the genitals
- Peculiar burns
- Unexplained fearfulness of a caregiver

History

Often, more time is needed to interview and evaluate elderly patients, partly because they may have characteristics that interfere with the evaluation:

- **Sensory deficits:** Dentures, eyeglasses, or hearing aids, if normally worn, should be worn to facilitate communication during the interview. Adequate lighting also helps.
- **Underreporting of symptoms:** Elderly patients may not report symptoms that they consider part of normal aging (eg, dyspnea, hearing or vision deficits, memory problems, incontinence, gait disturbance, constipation, dizziness, falls). However, no symptom should be attributed to normal aging unless a thorough evaluation is done and other causes have been eliminated.
- **Unusual manifestations of a disorder:** In the elderly, typical manifestations of a disorder may be absent (see p. [3088](#)). Instead, the elderly may present with general symptoms (eg, fatigue, confusion, weight loss).
- **Functional decline as the only manifestation:** Disorders may manifest solely as functional decline. In such cases, standard questions may not apply. For example, when asked about joint symptoms, patients with severe arthritis may not report pain, swelling, or stiffness, but if asked about changes in activities, they may report that they no longer take walks or no longer volunteer at the hospital. Questions about duration of functional decline (eg, "How long have you been unable to do your own shopping?") can elicit useful information. Identifying people when they have just started to have difficulty doing basic activities of daily living (ADLs) or instrumental ADLs (IADLs) may provide more opportunities for interventions to restore function or to prevent further decline and thus maintain independence.
- **Difficulty recalling:** Patients may not accurately remember past illnesses, hospitalizations, operations, and drug use; clinicians may have to obtain these data elsewhere (eg, from family members, a home health aide, or medical records).
- **Fear:** The elderly may be reluctant to report symptoms because they fear hospitalization, which they may associate with dying.
- **Age-related disorders and problems:** Depression (common among the elderly), the cumulative losses of old age, and discomfort due to a disorder may make the elderly less apt to provide health-related information to clinicians. Patients with impaired cognition may have difficulty describing problems, impeding the physician's evaluation.

Information acquired during the interview and history should be recorded in the patient's medical record.

Interview: A clinician's knowledge of an elderly patient's everyday concerns, social circumstances, mental function, emotional state, and sense of well-being helps orient and guide the interview. Asking patients to describe a typical day elicits information about their quality of life and mental and physical function. This approach is especially useful during the first meeting. Patients should be given time to speak about things of personal importance. Clinicians should also ask whether patients have specific concerns, such as fear of falling. The resulting rapport can help the clinician communicate better with patients and their family members.

A mental status examination may be necessary early in the interview to determine the patient's reliability; this examination should be conducted tactfully so that the patient does not become embarrassed, offended, or defensive.

Often, verbal and nonverbal clues (eg, the way the story is told, tempo of speech, tone of voice, eye contact) can provide information, as for the following:

- **Depression:** Elderly patients may omit or deny symptoms of anxiety or depression but betray them by a lowered voice, subdued enthusiasm, or even tears.
- **Physical and mental health:** What patients say about sleep and appetite may be revealing.

- **Weight gain or loss:** Clinicians should note any change in the fit of clothing or dentures.

Unless mental status is impaired, a patient should be interviewed alone to encourage the discussion of personal matters. Clinicians often also need to speak with a relative or caregiver—with the patient absent, present, or both. Such people often give a different perspective on function, mental status, and emotional state.

The clinician should ask the patient's permission before inviting a relative or caregiver to be present and should explain that such interviews are routine. When the caregiver is interviewed alone, the patient should be kept usefully occupied (eg, filling out a standardized assessment questionnaire, being interviewed by another member of the interdisciplinary team).

If indicated, clinicians should consider the possibility of drug abuse and patient abuse by the caregiver.

Medical history: When asking patients about their past medical history, a clinician should ask about disorders that used to be more common (eg, rheumatic fever, poliomyelitis) and about outdated treatments (eg, pneumothorax therapy for TB, mercury for syphilis). A history of immunizations (eg, tetanus, influenza, pneumococcus), adverse reactions to immunizations, and skin test results for TB is needed. If patients recall having surgery but do not remember the procedure or its purpose, surgical records should be obtained if possible.

Clinicians should ask questions designed to systematically review each body area or system and thus check for other disorders and common problems that patients may have forgotten to mention (see [Table 307-3](#)).

Drug history: The drug history should be recorded, and a copy should be given to patients or their caregiver. It should contain

- Drugs used
- Dose
- Dosing schedule
- Prescriber
- Reason for prescribing the drugs
- Precise nature of any drug allergies

All drugs used should be recorded: topical drugs (which may be absorbed systemically), OTC drugs (which can have serious consequences if overused and may interact with prescription drugs), dietary supplements, and medicinal herb preparations (because many can interact adversely with prescription and OTC drugs). Patients or a family member should be asked to bring in all of the above drugs and supplements at the initial visit and periodically thereafter. Clinicians can make sure patients have the prescribed drugs, but

[[Table 307-3](#). Clues to Disorders in Elderly Patients]

possession of these drugs does not guarantee adherence. Counting the number of tablets in each vial during the first and subsequent visits may be necessary. If someone other than a patient administers the drugs, that person is interviewed.

Patients should be asked to demonstrate their ability to read labels (often printed in small type), open containers (especially the child-resistant type), and recognize drugs. Patients should be advised not to put their drugs into one container.

Alcohol, tobacco, and recreational drug use history: Patients who smoke should be counseled to stop and, if they continue, not to smoke in bed because the elderly are more likely to fall asleep while doing so.

Patients should be checked for signs of alcohol use disorders, which are underdiagnosed in the elderly. Such signs include confusion, anger, hostility, alcohol odor on the breath, impaired balance and gait, tremors, peripheral neuropathy, and nutritional deficiencies. Screening questionnaires (eg, CAGE questionnaire—see

[Table 309-1](#) on p. [3105](#)) and questions about quantity and frequency of alcohol consumption can help.

Questions about use of other recreational drugs or substances of abuse are appropriate.

Nutrition history: Type, quantity, and frequency of food eaten are determined. Patients who eat ≤ 2 meals a day are at risk of undernutrition. Clinicians should ask about the following:

- Any special diets (eg, low-salt, low-carbohydrate) or self-prescribed fad diets
- Intake of dietary fiber and prescribed or OTC vitamins
- Weight loss and change of fit in clothing
- Amount of money patients have to spend on food
- Accessibility of food stores and suitable kitchen facilities
- Variety and freshness of foods

The ability to eat (eg, to chew and swallow) is evaluated. It may be impaired by xerostomia, which is common among the elderly. Decreased taste or smell may reduce the pleasure of eating, so patients may eat less. Patients with decreased vision, arthritis, immobility, or tremors may have difficulty preparing meals and may injure or burn themselves when cooking. Patients who are worried about urinary incontinence may reduce their fluid intake; as a result, they may eat less food.

Mental health history: Mental health problems may not be detected easily in elderly patients. Symptoms that may indicate a mental health disorder in younger patients (eg, insomnia, changes in sleep patterns, constipation, cognitive dysfunction, anorexia, weight loss, fatigue, preoccupation with bodily functions, increased alcohol consumption) may have another cause in the elderly. Sadness, hopelessness, and crying episodes may indicate depression. Irritability may be the primary affective symptom of depression, or patients may present with cognitive dysfunction. Generalized anxiety is the most common mental disorder encountered in elderly patients and often accompanies depression.

Patients should be asked about delusions and hallucinations, past mental health care (including psychotherapy, institutionalization, and electroconvulsive therapy), use of psychoactive drugs, and recent changes in circumstances. Many circumstances (eg, recent loss of a loved one, hearing loss, a change in residence or living situation, loss of independence) may contribute to depression.

Patients' spiritual and religious preferences, including their personal interpretation of aging, declining health, and death, should be clarified.

Functional status: Whether patients can function independently, need some help with basic activities of daily living (ADLs) or instrumental ADLs (IADLs), or need total assistance is determined, often as part of comprehensive geriatric assessment. Patients may be asked open-ended questions about their ability to do activities, or they may be asked to fill out a standardized assessment instrument with questions about specific ADLs and IADLs (eg, Katz ADL Scale [see [Table 350-3](#) on p. [3457](#)], Lawton IADL Scale [see [Table 307-4](#)]).

Social history: Clinicians should identify patients' living arrangements, particularly where and with whom

they live (eg, alone in an isolated house, in a busy apartment building), accessibility of their residence (eg, up stairs or a hill), and what modes of transportation are available to them. Such factors affect the ability of the elderly to obtain food, health care, and other important resources. A home visit, although difficult to arrange, can provide critical information. For example, clinicians can gain insight about nutrition from the refrigerator's contents and about multiple ADLs from the bathroom's condition. The number of rooms, number and type of phones, presence of smoke and carbon monoxide detectors, and condition of plumbing and heating system are determined, as is the availability of elevators, stairs, and air conditioning. Home safety evaluations can identify home features that can lead to falls (eg, poor lighting, slippery bathtubs, unanchored rugs), and solutions can be suggested.

Having patients describe a typical day, including activities such as reading, television viewing, work, exercise, hobbies, and interactions with other people, provides valuable information.

Clinicians should ask about the following:

- Frequency and nature of social contacts (eg, friends, senior citizens' groups), family visits, and religious or spiritual participation
- Driving and availability of other forms of transportation
- Caregivers and support systems (eg, church, senior citizens' groups, friends, neighbors) that are available to the patient
- The ability of family members to help the patient (eg, their employment status, their health, traveling time to the patient's home)
- The patient's attitude toward family members and their attitude toward the patient (including their level of interest in helping and willingness to help)

Marital status of patients is noted. Questions about sexual practices and satisfaction must be sensitive and tactful but thorough. The number and sex of sex partners are determined, and risk of sexually transmitted diseases is evaluated. Many sexually active elderly people do not know about safe sex practices.

Patients should be asked about educational level, jobs held, known exposures to radioactivity or asbestos, and current and past hobbies.

[[Table 307-4](#). Lawton Instrumental Activities of Daily Living Scale*]

Economic difficulties due to retirement, a fixed income, or death of a spouse or partner are discussed. Financial or health problems may result in loss of a home, social status, or independence. Patients should be asked about past relationships with physicians; a longtime relationship with a physician may have been lost because the physician retired or died or because the patient relocated.

Patient wishes regarding measures for prolonging life must be documented. Patients are asked what provisions for surrogate decision making (advance directives—see p. [3471](#)) have been made in case they become incapacitated, and if none have been made, patients are encouraged to make them.

Key Points

- Unless corrected, sensory deficits, especially hearing deficits, may interfere with history-taking.
- Many disorders in the elderly manifest only as functional decline.
- As part of the drug history, the patient or a family member should be asked to bring in all the patient's drugs, including OTC drugs, at the initial visit and periodically thereafter.
- Health care practitioners must often interview caregivers to obtain the history of functionally dependent

elderly patients.

Physical Examination

Observing patients and their movements (eg, walking into the examination room, sitting in or rising from a chair, getting on and off an examination table, taking off or putting on socks and shoes) can provide valuable information about their function. Their personal hygiene (eg, state of dress, cleanliness, smell) may provide information about mental status and the ability to care for themselves.

If patients become fatigued, the physical examination may need to be stopped and continued at another visit. Elderly patients may require additional time to undress and transfer to the examining table; they should not be rushed. The examining table should be adjusted to a height that patients can easily access; a footstool facilitates mounting. Frail patients must not be left alone on the table. Portions of the examination may be more comfortable if patients sit in a chair.

Clinicians should describe the general appearance of patients (eg, comfortable, restless, undernourished, inattentive, pale, dyspneic, cyanotic). If they are examined at bedside, use of protective padding or a protective mattress, bedside rails (partial or full), restraints, a urinary catheter, or an adult diaper should be noted.

Vital Signs

Weight should be recorded at each visit. During measurement, patients with balance problems may need to grasp grab bars placed near or on the scale. Height is recorded annually to check for height loss due to osteoporosis.

Temperature is recorded. Hypothermia can be missed if the thermometer cannot measure temperatures more than a few degrees lower than normal. Absence of fever does not exclude infection.

Pulses and BP are checked in both arms. Pulse is taken for 30 sec, and any irregularity is noted. Because many factors can alter BP, BP is measured several times after patients have rested > 5 min.

BP may be overestimated in elderly patients because their arteries are stiff. This condition, called pseudohypertension, should be suspected if dizziness develops after antihypertensives are begun or doses are increased to treat elevated systolic BP.

All elderly patients are checked for orthostatic hypotension because it is common. BP is measured with patients in the supine position, then after they have been standing for 3 to 5 min. If systolic BP falls ≥ 20 mm Hg after patients stand, orthostatic hypotension is diagnosed. Caution is required when testing hypovolemic patients.

A normal respiratory rate in elderly patients may be as high as 25 breaths/min. A rate of > 25 breaths/min may be the first sign of a lower respiratory tract infection, heart failure, or another disorder.

Skin

Initial observation includes color (normal rubor, pale, cyanotic). Examination includes a search for premalignant and malignant lesions, tissue ischemia, and pressure ulcers. In the elderly, the following should be considered:

- Ecchymoses may occur readily when skin is traumatized, often on the forearm, because the dermis thins with aging.
- Uneven tanning may be normal because melanocytes are progressively lost with aging.
- Longitudinal ridges on the nails and absence of the crescent-shaped lunula are normal age-related findings.

- Nail plate fractures may occur because with aging, the nail plate thins.
- Black splinter hemorrhages in the middle or distal third of the fingernail are more likely to be due to trauma than to bacteremia.
- A thickened, yellow toenail indicates onychomycosis, a fungal infection.
- Toenail borders that curve in and down indicate ingrown toenail (onychocryptosis).
- Whitish nails that scale easily, sometimes with a pitted surface, indicate psoriasis.
- Unexplained bruises may indicate abuse.

Head and Neck

Face: Normal age-related findings may include the following:

- Eyebrows that drop below the superior orbital rim
- Descent of the chin
- Loss of the angle between the submandibular line and neck
- Wrinkles
- Dry skin
- Thick terminal hairs on the ears, nose, upper lip, and chin

The temporal arteries should be palpated for tenderness and thickening, which may indicate giant cell arteritis.

Nose: Progressive descent of the nasal tip is a normal age-related finding. It may cause the upper and lower lateral cartilage to separate, enlarging and lengthening the nose.

Eyes: Normal age-related findings include the following:

- Loss of orbital fat: It may cause gradual sinking of the eye backward into the orbit (enophthalmos). Thus, enophthalmos is not necessarily a sign of dehydration in the elderly. Enophthalmos is accompanied by deepening of the upper eyelid fold and slight obstruction of peripheral vision.
- Pseudoptosis (decreased size of the palpebral aperture)
- Entropion (inversion of lower eyelid margins)
- Ectropion (eversion of lower eyelid margins)
- Arcus senilis (a white ring at the limbus)

With aging, presbyopia develops; the lens becomes less elastic and less able to change shape when focusing on close objects.

The eye examination should focus on testing visual acuity (eg, using a Snellen chart). Visual fields can be tested at the bedside by confrontation—ie, patients are asked to stare at the examiner so that the examiner can determine differences between their and the examiner's visual field. However, such testing has low sensitivity for most visual disorders. Tonometry is occasionally done in primary care; however, it is usually done by ophthalmologists or optometrists as part of routine eye examinations or by ophthalmologists when a patient is referred to them because glaucoma is clinically suspected.

Ophthalmoscopy is done to check for cataracts, optic nerve or macular degeneration, and evidence of glaucoma, hypertension, or diabetes. Findings may be unremarkable unless a disorder is present because the retina's appearance may not change much with aging. In elderly patients, mild to moderate elevated intracranial pressure may not result in papilledema because cortical atrophy occurs with aging; papilledema is more likely when pressure is markedly increased. Areas of black pigment or hemorrhages in and around the macula indicate macular degeneration.

For all elderly patients, an eye examination by an ophthalmologist or optometrist is recommended every 1 to 2 yr because such an examination may be much more sensitive for certain common eye disorders (eg, glaucoma, cataracts, retinal disorders).

Ears: Tophi, a normal age-related finding, may be noted during inspection of the pinna. The external auditory canal is examined for cerumen, especially if a hearing problem is noted during the interview. If a patient wears a hearing aid, it is removed and examined. The ear mold and plastic tubing can become plugged with wax, or the battery may be dead, indicated by absence of a whistle (feedback) when the volume of the hearing aid is turned up.

To evaluate hearing, examiners, with their face out of the patient's view, whisper 3 to 6 random words or letters into each of the patient's ears. If a patient correctly repeats at least half of these words for each ear, hearing is considered functional for one-on-one conversations. Patients with presbycusis (age-related, gradual, bilateral, symmetric, and predominantly high-frequency hearing deficits) are more likely to report difficulty in understanding speech than in hearing sounds. Evaluation with a portable audioscope, if available, is also recommended.

Mouth: The mouth is examined for bleeding or swollen gums, loose or broken teeth, fungal infections, and signs of cancer (eg, leukoplakia, erythroplakia, ulceration, mass). Findings may include

- Darkened teeth: Due to extrinsic stains and less translucent enamel, which occur with aging
- Fissures in the mouth and tongue and a tongue that sticks to the buccal mucosa: Due to xerostomia
- Erythematous, edematous gingiva that bleeds easily: Usually indicating a gingival or periodontal disorder
- Bad breath: Possibly indicating caries, periodontitis, another oral disorder, or sometimes a pulmonary disorder

The dorsal and ventral surfaces of the tongue are examined. Common age-related changes include varicose veins on the ventral surface, erythema migrans (geographic tongue), and atrophied papillae on the sides of the tongue. In edentulous patients, the tongue may enlarge to facilitate chewing; however, enlargement may also indicate amyloidosis or hypothyroidism. A smooth, painful tongue may indicate vitamin B₁₂ deficiency.

Dentures should be removed before the mouth is examined. Dentures increase risk of oral candidiasis and resorption of the alveolar ridges. Inflammation of the palatal mucosa and ulcers of the alveolar ridges may result from poorly fitting dentures.

The interior of the mouth is palpated. A swollen, firm, and tender parotid gland may indicate parotitis, particularly in dehydrated patients; pus may be expressed from Stensen's duct when bacterial parotitis is present. The infecting organisms are often staphylococci.

Painful, inflamed, fissured lesions at the lip commissures (angular cheilitis) may be noted in edentulous patients who do not wear dentures; these lesions are usually accompanied by a fungal infection.

Temporomandibular joint: This joint should be evaluated for degeneration (osteoarthritis), a common age-related change. The joint can degenerate as teeth are lost and compressive forces in the joint become excessive. Degeneration may be indicated by joint crepitus felt at the head of the condyle as

patients lower and raise their jaw, by painful jaw movements, or by both.

Neck: The thyroid gland, which is located low in the neck of elderly people, often beneath the sternum, is examined for enlargement and nodules.

Carotid bruits due to transmitted heart murmurs can be differentiated from those due to carotid artery stenosis by moving the stethoscope up the neck: A transmitted heart murmur becomes softer; the bruit of carotid artery stenosis becomes louder. Bruits due to carotid artery stenosis suggest systemic atherosclerosis. Whether asymptomatic patients with carotid bruits require evaluation or treatment for cerebrovascular disease is unclear.

The neck is checked for flexibility. Resistance to passive flexion, extension, and lateral rotation may indicate a cervical spine disorder. Resistance to flexion and extension can also occur in patients with meningitis, but unless meningitis is accompanied by a cervical spine disorder, the neck can be rotated passively from side to side without resistance.

Chest and Back

All areas of the lungs are examined by percussion and auscultation. Basilar rales may be heard in the lungs of healthy patients but should disappear after patients take a few deep breaths. The extent of respiratory excursions (movement of the diaphragm and ability to expand the chest) should be noted.

The back is examined for scoliosis and tenderness. Severe low back, hip, and leg pain with marked sacral tenderness may indicate spontaneous osteoporotic fractures of the sacrum, which can occur in elderly patients.

Breasts: In men and women, the breasts should be examined annually for irregularities and nodules. For women, monthly self-examinations are also recommended, as is annual screening mammography, especially for women who have a family history of breast cancer. If nipples are retracted, pressure should be applied around the nipples; pressure everts the nipples when retraction is due to aging but not when it is due to an underlying lesion.

Heart: Heart size can usually be assessed by palpating the apex. However, displacement caused by kyphoscoliosis may make assessment difficult.

Auscultation should be done systematically. In elderly patients, a systolic murmur most commonly indicates

- **Aortic valve sclerosis:** Typically, this murmur is not hemodynamically significant. It peaks early during systole and is rarely heard in the carotid arteries.

However, systolic murmurs may be due to other disorders, which should be identified:

- **Aortic valve stenosis:** This murmur, in contrast to that of aortic valve sclerosis, typically peaks later during systole, is transmitted to the carotid arteries, and is loud (greater than grade 2); the 2nd heart sound is dampened, pulse pressure is narrow, and the carotid up-stroke is slowed. However, in elderly patients, the murmur of aortic valve stenosis may be difficult to identify because it may be softer, a 2nd heart sound is rarely audible, and narrow pulse pressures are uncommon. Also, in many elderly patients with aortic valve stenosis, the carotid upstroke does not slow because vascular compliance is diminished.
- **Mitral regurgitation:** This murmur is usually loudest at the apex and radiates to the axilla.
- **Hypertrophic obstructive cardiomyopathy:** This murmur intensifies when patients do a Valsalva maneuver.

Fourth heart sounds are common among elderly people without evidence of a cardiovascular disorder and are commonly absent among elderly people with evidence of a cardiovascular disorder. Diastolic

murmurs are abnormal in people of any age. Unexplained and asymptomatic sinus bradycardia in apparently healthy elderly people may not be clinically important.

If new neurologic or cardiovascular symptoms develop in patients with a pacemaker, evaluation for variable heart sounds, murmurs, and pulses and for hypotension and heart failure is required. These symptoms and signs may be due to loss of atrioventricular synchrony.

GI System

The abdomen is palpated to check for weak abdominal muscles, which are common among elderly people and which may result in hernias. Most abdominal aortic aneurysms are palpable as a pulsatile mass; however, only their lateral width can be assessed during physical examination. In some patients (particularly thin ones), a normal aorta is palpable, but the vessel and pulsations do not extend laterally. The liver and spleen are palpated for enlargement. Frequency and quality of bowel sounds are checked, and the suprapubic area is percussed for tenderness, discomfort, and evidence of urinary retention.

The anorectal area is examined externally for fissures, hemorrhoids, and other lesions. Sensation and the anal wink reflex are tested. A digital rectal examination (DRE) to detect a mass, stricture, tenderness, or fecal impaction is done in men and women. Fecal occult blood testing is also done.

Male GU System

The prostate gland is palpated for nodules, tenderness, and consistency. Estimating prostate size by DRE is inaccurate, and size does not correlate with urethral obstruction; however, DRE provides a qualitative evaluation.

Female Reproductive System

Regular pelvic examinations, with a Papa-nicolaou (Pap) test every 2 to 3 yr until age 70, are recommended. At age 70, testing can be stopped if results of the previous 2 consecutive tests were normal. If women ≥ 70 have not had regular Pap tests, they should have at least 2 negative tests, 1 yr apart, before testing is stopped. Once Pap testing has been stopped, it is restarted only if new symptoms or signs of a possible disorder develop. If women have had a hysterectomy, Pap tests are required only if cervical tissue remains.

For pelvic examination, patients who lack hip mobility may lie on their left side. Postmenopausal reduction of estrogen leads to atrophy of the vaginal and urethral mucosa; the vaginal mucosa appears dry and lacks rugal folds. The ovaries should not be palpable; palpable ovaries suggest cancer. Patients should be examined for evidence of prolapse of the urethra, vagina, cervix, and uterus. They are asked to cough to check for urine leakage and intermittent prolapse.

Musculoskeletal System

Joints are examined for tenderness, swelling, subluxation, crepitus, warmth, redness, and other abnormalities, which may suggest a disorder:

- Heberden's nodes (bony overgrowths at the distal interphalangeal joints) or Bouchard's nodes (bony overgrowths at the proximal interphalangeal joints): Osteoarthritis
- Subluxation of the metacarpophalangeal joints with ulnar deviation of the fingers: Chronic RA
- Swan-neck deformity (hyperextension of the proximal interphalangeal joint with flexion of the distal interphalangeal joint) and boutonniere deformity (hyperextension of the distal interphalangeal joint with flexion of the proximal interphalangeal joint): RA

These deformities may interfere with functioning or usual activities.

Active and passive range of joint motion should be determined. The presence of contractures should be

noted. Variable resistance to passive manipulation of the extremities (gegenhalten) sometimes occurs with aging.

Feet

Diagnosis and treatment of foot problems, which become common with aging, help elderly people maintain their independence. Common age-related findings include hallux valgus, medial prominence of the 1st metatarsal head with lateral deviation and rotation of the big toe, and lateral deviation of the 5th metatarsal head. Hammer toe (hyperflexion of the proximal interphalangeal joint) and claw toe (hyperflexion of the proximal and distal interphalangeal toe joints) may interfere with functioning and daily activities. Toe deformities may result from years of wearing poorly fitting shoes or from RA, diabetes, or neurologic disorders (eg, Charcot-Marie-Tooth disease). Occasionally, foot problems indicate other systemic disorders (see [Table 44-1](#) on p. [395](#)).

Patients with foot problems should be referred to a podiatrist for regular evaluation and treatment.

Neurologic System

Neurologic examination for elderly patients is similar to that for any adult. However, nonneurologic disorders that are common among elderly people may complicate this examination. For example, visual and hearing deficits may impede evaluation of cranial nerves, and periartthritis (inflammation of tissues around a joint) in certain joints, especially shoulders and hips, may interfere with evaluation of motor function.

Signs detected during the examination must be considered in light of the patient's age, history, and other findings. Symmetric findings unaccompanied by functional loss and other neurologic symptoms and signs may be noted in elderly patients. Clinicians must decide whether these findings justify a detailed evaluation to check for a neurologic lesion. Patients should be reevaluated periodically for functional changes, asymmetry, and new symptoms.

Cranial nerves: Evaluation may be complex. Elderly people often have small pupils; their pupillary light reflex may be sluggish, and their pupillary mitotic response to near vision may be diminished. Upward gaze and, to a lesser extent, downward gaze are slightly limited. Eye movements, when tracking an examiner's finger during evaluation of visual fields, may appear jerky and irregular. Bell's phenomenon (reflex upward movement of the eyes during closure) is sometimes absent. These changes occur normally with aging.

In many elderly people, sense of smell is diminished because they have fewer olfactory neurons, have had numerous upper respiratory infections, or have chronic rhinitis. However, asymmetric loss (loss of smell in one nostril) is abnormal. Taste may be altered because the sense of smell is diminished or because patients take drugs that decrease salivation.

Visual and hearing deficits may result from abnormalities in the eyes and ears rather than in nerve pathways.

Motor function: Patients can be evaluated for tremor during handshaking and other simple activities. If tremor is detected, amplitude, rhythm, distribution, frequency, and time of occurrence (at rest, with action, or with intention) are noted.

Muscle strength: Elderly people, particularly those who do not do resistance training regularly, may appear weak during routine testing. For example, during the physical examination, the clinician may easily straighten a patient's elbow despite the patient's effort to sustain a contraction. If weakness is symmetric, does not bother the patient, and has not changed the patient's function or activity level, it is likely to be clinically insignificant. Increased muscle tone, measured by flexing and extending the elbow or knee, is a normal finding in elderly people; however, jerky movements during examination and cogwheel rigidity are abnormal.

Sarcopenia (a decrease in muscle mass) is a common age-related finding. It is insignificant unless accompanied by a decline or change in function (eg, patients can no longer rise from a chair without using chair arms). Sarcopenia affects the hand muscles (eg, interosseous and thenar muscles) in particular. Weak extensor muscles of the wrist, fingers, and thumb are common among patients who use wheelchairs because compression of the upper arm against the armrest injures the radial nerve. Arm function can be tested by having patients pick up an eating utensil or touch the back of their head with both hands.

Coordination: Motor reaction time and motor coordination are tested. Reaction time often increases with aging, partly because conduction of signals along peripheral nerves slows. Coordination decreases because of changes in central mechanisms, but this decrease is usually subtle and does not impair function.

Gait and posture: All components of gait should be assessed; they include initiation of walking; step length, height, symmetry, continuity, and cadence (rhythm); velocity (speed of walking); stride width; and walking posture (see [Table 307-5](#)). Sensation, musculoskeletal and motor control, and attention, which are necessary for independent, coordinated walking, must also be considered.

Normal age-related findings may include the following:

- Shorter steps, possibly because calf muscles are weak or because balance is poor
- Reduced gait velocity in patients > 70 because steps are shorter
- Increased time in double stance (when both feet are on the ground), which may be due to impaired balance or fear of falling
- Reduced motion in some joints (eg, ankle plantar flexion just before the back foot lifts off, pelvic motion in the frontal and transverse planes)
- Slight changes in walking posture (eg, greater downward pelvic rotation, possibly due to a combination of increased abdominal fat, abdominal muscle weakness, and tight hip flexor muscles; a slightly greater turn-out of the toes, possibly due to loss of hip internal rotation or to an attempt to increase lateral stability)

Aging has little effect on walking cadence or posture; typically, the elderly walk upright unless a disorder is present.

Overall postural control is evaluated using Romberg's test (patients stand with feet together and eyes closed). With aging, postural control is often impaired, and postural sway (movement in the anteroposterior plane when patients remain stationary and upright) may increase.

Reflexes: The deep tendon reflexes are checked. Aging usually has little effect on them. However, eliciting the Achilles tendon

[[Table 307-5](#). Some Causes of Gait Dysfunction]

reflex may require special techniques (eg, testing while patients kneel with their feet over the edge of a bed and with their hands clasped). A diminished or absent reflex, present in nearly half of elderly patients, may be normal. It occurs because tendon elasticity decreases and nerve conduction in the tendon's long reflex arc slows. Asymmetric Achilles tendon reflexes may indicate sciatica.

Cortical release reflexes (known as pathologic reflexes), which include snout, sucking, and palmomental reflexes, occasionally occur in elderly patients who have no detectable brain disorders (eg, dementia). Babinski's reflex (extensor plantar response) in elderly patients is abnormal; it indicates an upper motor neuron lesion, often cervical spondylosis with partial cord compression.

Sensation: Evaluation of sensation includes touch (using a skin prick test), cortical sensory function, temperature sense, proprioception (joint position sense), and vibration sense testing. Aging has limited effects on sensation. Many elderly patients report numbness, especially in the feet. It may result from a decrease in size of fibers in the peripheral nerves, particularly the large fibers. Nonetheless, patients with numbness should be checked for peripheral neuropathies. In many patients, no cause of numbness can be identified.

Many elderly people lose vibratory sensation below the knees. It is lost because small vessels in the posterior column of the spinal cord change. However, proprioception, which is thought to use a similar pathway, is unaffected.

Mental status: A mental status examination is important (see also [Sidebar 168-1](#) on p. [1588](#)). Patients who are disturbed by such a test should be reassured that it is routine. The examiner must make sure that patients can hear; hearing deficits that prevent patients from hearing and understanding questions may be mistaken for cognitive dysfunction. Evaluating the mental status of patients who have a speech or language disorder (eg, mutism, dysarthria, speech apraxia, aphasia) can be difficult.

Orientation may be normal in many patients with dementia or other cognitive disorders. Thus, evaluation may require questions that identify abnormalities in consciousness, judgment, calculations, speech, language, praxis, executive function, or memory, as well as orientation. Abnormalities in these areas cannot be attributed solely to age, and if abnormalities are noted, further evaluation, including a formal test of mental status, is needed.

With aging, information processing and memory retrieval slow but are essentially un-impaired. With extra time and encouragement, patients do such tasks satisfactorily (unless a neurologic abnormality is present).

Nutritional Status

Aging changes the interpretation of many measurements that reflect nutritional status in younger people. For example, aging can alter height. Weight changes can reflect alterations in nutrition, fluid balance, or both. The proportion of lean body mass and body fat content changes. Despite these age-related changes, body mass index (BMI) is still useful in elderly patients. If abnormalities in the nutrition history (eg, weight loss, suspected deficiencies in essential nutrients) or BMI are identified, thorough nutritional evaluation, including laboratory measurements, is indicated.

Key Points

- Valuable information about a patient's function can be gained by observing the patient.
- Physical examination should include all systems, particularly mental status, and may require 2 sessions.

Comprehensive Geriatric Assessment

Comprehensive geriatric assessment is a multidimensional process designed to assess the functional ability, health (physical, cognitive, and mental), and socioenvironmental situation of elderly people.

The comprehensive geriatric assessment specifically and thoroughly evaluates functional and cognitive abilities, social support, financial status, and environmental factors as well as physical and mental health (see [Table 307-6](#)). Ideally, a regular examination of elderly patients incorporates many aspects of the comprehensive geriatric assessment, making the 2 approaches very similar. Assessment results are coupled with sustained individually tailored interventions (eg, rehabilitation, education, counseling, supportive services).

The cost of geriatric assessment limits its use. Thus, this assessment may be used mainly in high-risk elderly patients, such as the frail or chronically ill (eg, identified via mailed health questionnaires or

interviews in the home or meeting places). Family members may also request a referral for geriatric assessment.

Assessment can have the following benefits:

- Improved care and clinical outcomes

[[Table 307-6](#). A Geriatric Assessment Instrument]

- Greater diagnostic accuracy
- Improved functional and mental status
- Reduced mortality
- Decreased use of nursing homes and acute care hospitals
- Greater satisfaction with care

If elderly patients are relatively healthy, a standard medical evaluation may be appropriate.

Comprehensive geriatric assessment is most successful when done by a geriatric interdisciplinary team (typically, a geriatrician, nurse, social worker, and pharmacist). Usually, assessments are done in an outpatient setting. However, patients with physical or mental impairments and chronically ill patients may require inpatient assessment.

Assessment Domains

The principal domains assessed are

- **Functional ability:** Ability to do activities of daily living (ADLs) and instrumental ADLs (IADLs) are assessed. ADLs include eating, dressing, bathing, transferring between the bed and a chair, using the toilet, and controlling bladder and bowel. IADLs enable people to live independently and include preparing meals, doing housework, taking drugs, going on errands, managing finances, and using a telephone.
- **Physical health:** History and physical examination should include problems common among the elderly (eg, problems with vision, hearing, continence, gait, and balance).
- **Cognition and mental health:** Several validated screening tests for cognitive dysfunction (eg, mental status examination—see [Sidebar 168-1](#) on p. 1588) and for depression (eg, Geriatric Depression Scale [see [Table 307-7](#)], Hamilton Depression Scale) can be used.
- **Socioenvironmental situation:** The patient's social interaction network, available social support resources, and special needs and the safety and convenience of the patient's environment are determined, often by a nurse or social worker. Such factors influence the treatment approach used. A checklist can be used to assess home safety.

Standardized instruments make evaluation of these domains more reliable and efficient (see [Table 307-6](#)). They also facilitate communication of clinical information among health care practitioners and monitoring of changes in the patient's condition over time.

Unusual Presentations of Illness in the Elderly

In the elderly, many common conditions can exist without their characteristic features. Instead, the elderly may have ≥ 1 nonspecific geriatric syndromes (eg, acute confusion, dizziness, syncope, falling, weight loss, incontinence). These syndromes result from multiple disorders and impairments; nonetheless,

patients may improve when only some of the precipitating factors are corrected. An even better strategy is to identify risk factors for these syndromes and correct as many as possible, thus reducing the likelihood of the syndrome's developing at all.

Although virtually any illness or drug intoxication can cause geriatric syndromes, the following disorders are especially likely to trigger one or more of them, sometimes instead of causing the typical symptoms and signs.

Acute bowel infarction may be indicated by acute confusion. Abdominal pain and tenderness may be absent.

Appendicitis pain tends to begin in the right lower quadrant rather than periumbilically. Eventually, pain may be diffuse in the abdomen rather than localized to the right lower quadrant. However, tenderness in this quadrant is a significant early sign.

Bacteremia causes a low-grade (at least) fever in most elderly patients, although fever may be absent. The source of bacteremia may be difficult to identify. Elderly patients may have nonspecific manifestations (eg, general malaise, anorexia, night sweats, unexplained change in mental status).

Biliary disorders may result in nonspecific mental and physical deterioration (eg, malaise, confusion, loss of mobility) without jaundice, fever, or abdominal pain. Abnormal liver function test results may be the only indication.

Heart failure may cause confusion, agitation, anorexia, weakness, insomnia, fatigue, weight loss, or lethargy; patients may not report dyspnea. Orthopnea may cause nocturnal agitation in patients who also have dementia. Peripheral edema is less specific as a sign of heart failure in elderly than in younger patients. In bedbound patients, edema may occur in the sacral area rather than in the lower extremities.

Hyperparathyroidism may cause nonspecific symptoms: fatigue, cognitive dysfunction, emotional instability, anorexia, constipation, and hypertension. Characteristic symptoms are often absent.

Hyperthyroidism may not cause the characteristic signs (eg, eye signs, enlarged thyroid gland). Instead, symptoms and signs may be subtle and may include tachycardia, weight loss, fatigue, weakness, palpitations, tremor, atrial fibrillation, and heart failure. Patients may appear apathetic rather than hyperkinetic.

Hypothyroidism may manifest subtly in elderly patients. The most common symptoms are nonspecific (eg, fatigue, weakness, falling). Anorexia, weight loss, and arthralgias may occur. Cold intolerance, weight gain, depression, paresthesias, hair loss, and muscle cramps are less common than among younger patients; cognitive dysfunction is more common. The most specific sign—delayed tendon reflex relaxation—may not be detectable in elderly patients because of decreased amplitude or absent reflexes.

Meningitis may cause fever and a change in mental status without symptoms of meningeal irritation (eg, headache, nuchal rigidity).

[[Table 307-7](#). Geriatric Depression Scale (Short Form)]

MI may manifest as diaphoresis, dyspnea, epigastric distress, syncope, weakness, vomiting, or confusion rather than as chest pain. After the onset of chest pain or other presenting symptoms of MI, elderly patients tend to delay longer than younger patients in seeking medical assistance.

Peptic ulcer disease may not cause characteristic ulcer symptoms; pain may be absent, nonspecific, or masked by NSAIDs. Dyspepsia (usually epigastric discomfort with bloating, nausea, or early satiety) is more common among elderly than among younger patients. Elderly patients have more frequent, more severe GI bleeding, which may be painless. Slow, unrecognized blood loss may occur, resulting in severe anemia.

Pneumonia may be indicated by malaise, anorexia, or confusion. Tachycardia and tachypnea are

common, but fever may be absent. Coughing may be mild and without copious, purulent sputum, especially in dehydrated patients.

TB may manifest differently in elderly patients with coexisting disorders. Symptoms may be nonspecific (eg, fever, weakness, confusion, anorexia). Pulmonary TB may manifest with fewer respiratory symptoms (eg, cough, excessive sputum production, hemoptysis) than in younger patients.

UTIs may be present in afebrile elderly patients. These patients may not report dysuria, frequency, or urgency but may experience dizziness, confusion, anorexia, fatigue, or weakness.

Other problems that manifest differently in the elderly include alcohol abuse, adverse drug effects, alcohol abuse, depression, pulmonary embolism, systemic infections, and unstable angina.

Chapter 308. Drug Therapy in the Elderly

Introduction

Prevalence of prescription drug use among ambulatory adults increases substantially with age. Among people ≥ 65 , 90% use at least 1 drug per week, $> 40\%$ use at least 5 different drugs per week, and 12% use ≥ 10 different drugs per week. Women take more drugs, particularly psychoactive and arthritis drugs. Drug use is greatest among the frail elderly, hospitalized patients, and nursing home residents; typically, a nursing home resident is given 7 to 8 different drugs on a regular basis.

Providing safe, effective drug therapy for the elderly is challenging for many reasons:

- They use more drugs than any other age group, increasing risk of adverse effects and making adherence difficult.
- They are more likely to have chronic disorders that affect drug response.
- Their physiologic reserves are reduced and can be further reduced by acute and chronic disorders.
- Aging alters pharmacodynamics and pharmacokinetics.
- They may be less able to obtain or afford drugs.

There are 2 main approaches to optimizing drug therapy in the elderly:

- Using appropriate drugs as indicated to maximize effectiveness
- Avoiding adverse drug effects

Because the risk of adverse drug effects is high, overprescribing has been targeted as a major problem in the treatment of the elderly. However, underprescribing appropriate drugs must also be avoided.

Pharmacokinetics

Pharmacokinetics (see p. [3172](#)) is best defined as what the body does to the drug; it includes absorption, distribution across body compartments, metabolism, and excretion.

With aging, the metabolism and excretion of many drugs decrease, requiring that doses of some drugs be adjusted. Toxicity may develop slowly because levels of chronically used drugs tend to increase for about 5 to 6 half-lives. For example, certain benzodiazepines (diazepam, flurazepam, chlordiazepoxide) have half-lives of up to 96 h in many elderly patients; signs of toxicity may not appear until days or weeks after therapy is started.

Absorption: Despite an age-related decrease in small-bowel surface area, slowed gastric emptying, and an increase in gastric pH, changes in drug absorption tend to be clinically inconsequential for most drugs.

Distribution: With aging, body fat generally increases, and total body water decreases. Increased fat increases the volume of distribution for highly lipophilic drugs (eg, diazepam) and may increase their elimination half-lives.

Serum albumin decreases and α_1 -acid glycoprotein increases with age, but the clinical effect of these changes on serum drug binding is unclear. In patients with an acute disorder or undernutrition, rapid reductions in serum albumin may enhance drug effects because serum levels of unbound drug may increase (eg, with phenytoin or warfarin).

Hepatic metabolism: Overall hepatic metabolism of many drugs through the cytochrome P-450 enzyme system decreases with age. For drugs with decreased hepatic metabolism (see [Table 308-1](#)), clearance typically decreases 30 to 40%. Theoretically, maintenance drug doses should be

decreased by this percentage; however, rate of drug metabolism varies greatly from person to person, and individual titration is required.

Hepatic clearance of drugs with multistage metabolism (nonsynthetic and synthetic reactions) is more likely to be prolonged in the elderly (see also Metabolism on p. 3177). Usually, age does not greatly affect clearance of drugs that are metabolized by conjugation, typically with glucuronic acid.

Renal elimination: After age 30, creatinine clearance decreases an average of 8 mL/min/1.73 m²/decade; however, the age-related decrease varies substantially from person to person. Serum creatinine levels often remain within normal limits despite a decrease in GFR because the elderly generally have less muscle mass and thus produce less creatinine. Decreases in tubular function parallel those in glomerular function.

These changes decrease renal elimination of some drugs (see Table 308-1). Clinical implications depend on the extent that renal elimination contributes to total systemic elimination and on the drug's therapeutic index

[Table 308-1. Effect of Aging on Drug Metabolism* and Elimination]

(ratio of maximum tolerated dose to minimum effective dose). Creatinine clearance (measured or estimated using computer programs or a formula, such as Cockcroft-Gault—see p. 2313) is used to guide drug dosing. Because renal function is dynamic, maintenance doses of drugs should be adjusted when patients become ill or dehydrated or have recently recovered from dehydration.

Pharmacodynamics

Pharmacodynamics is defined as what the drug does to the body or the response of the body to the drug; it is affected by receptor binding, postreceptor effects, and chemical interactions (see p. 3181). In the elderly, the effects of similar drug concentrations at the site of action (sensitivity) may be greater or smaller than those in younger people (see Table 308-2). Differences may be due to changes in drug-receptor interaction, in post-receptor events, or in adaptive homeostatic responses and, among frail patients, are often due to pathologic changes in organs.

Elderly patients are particularly sensitive to anticholinergic drug effects. Many drugs (eg, tricyclic antidepressants, most nonselective antihistamines, some antipsychotic drugs, antiparkinsonian drugs with atropine-like activity, many OTC hypnotics and cold preparations) are anticholinergic. The elderly, most notably those with dementia, are particularly prone to CNS adverse effects of such drugs and may become more confused and drowsy. Anticholinergic drugs also commonly cause constipation, urinary retention (especially in elderly men with benign prostatic hyperplasia), blurred vision, orthostatic hypotension, and dry mouth. Even in low doses, these drugs can increase risk of heat-stroke by inhibiting diaphoresis.

Drug-Related Problems

Drug-related problems include

- Adverse effects
- Ineffectiveness

Adverse drug effects are effects that are unwanted, uncomfortable, or dangerous. Common examples are oversedation, confusion, hallucinations, falls, and bleeding. Among ambulatory people ≥ 65, adverse drug effects occur at a rate of about 50 events per 1000 person-years. Hospitalization rates due to adverse drug effects are 4 times higher in elderly patients (≈ 17%) than in younger patients (4%).

Reasons for Drug-Related Problems

Adverse drug effects can occur in any patient, but certain characteristics of the elderly make them more susceptible. For example, the elderly often take many drugs (polypharmacy) and have age-related changes in pharmacodynamics and pharmacokinetics; both increase the risk of adverse effects.

At any age, adverse drug effects may occur when drugs are prescribed and taken appropriately; eg, new-onset allergic reactions are not predictable or preventable. However, adverse effects are thought to be preventable in almost 90% of cases in the elderly (compared with only 24% in younger patients). Certain drug classes are commonly involved. In nursing home patients, preventable adverse drug effects commonly result from use of atypical antipsychotics, warfarin, antidepressants, and sedative-hypnotics. In community-dwelling elderly, the most common causes are hypoglycemic drugs, NSAIDs, and benzodiazepines.

In the elderly, a number of common reasons for adverse drug effects, ineffectiveness, or both are preventable (see [Table 308-3](#)). Several of these reasons involve inadequate communication with patients or among health care practitioners (particularly during health care transitions).

Inappropriate drugs: A drug is inappropriate if its potential for harm is greater than its potential for benefit. Inappropriate use of a drug may involve

- Choice of an unsuitable drug, dose, frequency of dosing, or duration of therapy
- Duplication of therapy
- Failure to consider drug interactions and correct indications for a drug
- Appropriate drugs that are mistakenly continued once an acute condition resolves (as may happen when patients move from one health care setting to another)

Adverse effects of inappropriate drugs account for about 3% of emergency department visits for patients ≥ 65 ; anticoagulants, anti-platelet drugs, drugs used to treat diabetes, and drugs with a narrow therapeutic index account for about half, and 3 drugs—warfarin, digoxin, and insulin—account for about one third. Thus, some classes of drugs are of special concern in the elderly (see p. [3098](#)). Some are so problematic that they should be avoided in the elderly; others can be used with increased caution. The Beers Criteria (see

[Table 308-5](#)) lists inappropriate drugs for the elderly by drug class; other similar lists are available.

However, there is no similar list of drugs that should be used in the elderly; clinicians must weigh benefits and risks of therapy in each patient.

Despite the Beers and other criteria, inappropriate drugs are still being prescribed for the elderly; typically, about 20% of community-dwelling elderly use at least one inappropriate drug. In such patients, risk of hospitalization is increased. In nursing home patients, inappropriate use increases risk of hospitalization and death. In one study of hospitalized patients, 27.5% were given an inappropriate drug.

Some inappropriate drugs are available OTC; thus, clinicians should specifically question patients about use of OTC drugs and tell patients about the potential problems such drugs can cause.

The elderly are often given drugs (typically, analgesics, H₂ blockers, hypnotics, or laxatives) for minor symptoms (including adverse

[\[Table 308-2. Effect of Aging on Drug Response\]](#)

[\[Table 308-3. Preventable Causes of Drug-Related Problems\]](#)

effects of other drugs) that may be better treated nonpharmacologically. Using such drugs is often inappropriate; benefit is low, and use increases cost and may lead to toxicity.

Solving the problem of inappropriate use in the elderly requires more than avoiding a short list of drugs

and noting drug categories of concern. A patient's entire drug regimen should also be assessed to determine its potential benefit vs harm.

Overdosage: An excessive dose of an appropriate drug may be prescribed for elderly patients if the prescriber does not consider age-related changes that affect pharmacokinetics (see p. [3090](#)) and pharmacodynamics (see p. [3091](#)). Doses of renally cleared drugs should be adjusted in patients with renal impairment, which is common among the elderly.

Generally, doses should be lower in the elderly, although dose requirements vary considerably from person to person. Typically, starting doses of about one third to one half the usual adult dose are indicated when a drug has a low therapeutic index or when another condition may be exacerbated by a drug. The dose is then titrated upward as tolerated to the desired effect. When the dose is increased, patients should be evaluated for adverse effects, and drug levels should be monitored when possible.

Overdosage can also occur when drug interactions (see p. [3095](#)) increase the amount of drug available or when different practitioners prescribe a drug and are unaware that another practitioner prescribed the same or a similar drug.

Underprescribing: Appropriate drugs may be underprescribed—not used for maximum effectiveness. Underprescribing may increase morbidity and mortality and reduce quality of life. Clinicians should use adequate drug doses and, when indicated, multidrug regimens.

Drugs that are often underprescribed in the elderly include those used to treat depression, Alzheimer's disease, pain (eg, opioids), heart failure, post-MI (β -blockers), atrial fibrillation (warfarin), hypertension, and incontinence and drugs to prevent glaucoma, influenza, and pneumococcal infection.

- **Opioids:** Clinicians are often reluctant to prescribe opioids for elderly patients with cancer or other types of chronic pain, typically because of concerns about adverse drug effects (eg, sedation, constipation, delirium) and development of dependence. When opioids are prescribed, the doses are often inadequate. Underprescribing opioids may mean that some elderly patients have needless pain and discomfort; elderly patients are more likely to report inadequate pain management than younger adults.
- **β -Blockers:** In patients with a history of MI, even in elderly patients at high risk of complications (eg, those with heart failure, pulmonary disorders, or diabetes mellitus), these drugs reduce mortality rates.
- **Antihypertensives:** Guidelines for treating hypertension (including isolated systolic hypertension) in the elderly are available, and treatment appears to be beneficial (reducing risk of stroke and major cardiovascular events). Nonetheless, studies indicate that hypertension is often not controlled in elderly patients.
- **Drugs for Alzheimer's disease:** Acetylcholinesterase inhibitors and NMDA (*N*-methyl-D-aspartate) antagonists have been shown to benefit patients with Alzheimer's disease. The amount of benefit is unclear, but patients and family members should be given the opportunity to make an informed decision about their use.

In elderly patients with a chronic disorder, acute or unrelated disorders may be under-treated (eg, hypercholesterolemia may be untreated in patients with emphysema). Clinicians may withhold these treatments because of concern about increasing the risk of adverse effects. Clinicians may think that treatment of the primary problem is all patients can or want to handle or that patients cannot afford the additional drugs.

Drug-disease interactions: A drug given to treat one disease can exacerbate another disease regardless of patient age, but such interactions are of special concern in the elderly, who are more likely to have multiple disorders. Distinguishing often subtle adverse drug effects from the effects of disease is difficult (see [Table 308-4](#)) and may lead to a prescribing cascade.

A **prescribing cascade** occurs when the adverse effect of a drug is misinterpreted as a symptom or sign of a new disorder and a new drug is prescribed to treat it. The new, unnecessary drug may cause additional adverse effects, which may then be misinterpreted as yet another disorder and treated unnecessarily, and so on.

Many drugs have adverse effects that resemble symptoms of disorders common among the elderly or changes due to aging. The following are examples:

- **Antipsychotics** may cause symptoms that resemble Parkinson's disease. In elderly patients, these symptoms may be diagnosed as Parkinson's disease and treated, possibly leading to adverse effects from the antiparkinson drugs (eg, orthostatic hypotension, delirium).
- **Cholinesterase inhibitors** (eg, donepezil) may be prescribed for patients with dementia. These drugs may cause diarrhea or urinary incontinence. Patients may then be prescribed an anticholinergic drug (eg, oxybutynin). Thus, an unnecessary drug is added, increasing the risk of adverse drug effects and drug-drug interactions. A better strategy is to reduce the dose of the cholinesterase inhibitor or consider a different treatment for dementia (eg, memantine) with a different mechanism of action.

In elderly patients, prescribers should always consider the possibility that a new symptom or sign is due to drug therapy.

Drug-drug interactions: Because the elderly often take many drugs, they are particularly vulnerable to drug-drug interactions. The elderly also frequently use medicinal herbs and other dietary supplements (see p. [3421](#)) and may not tell their physician. Medicinal herbs can interact with prescribed drugs and lead to adverse effects. For example, ginkgo biloba extract taken with warfarin can increase risk of bleeding, and St. John's wort taken with an SSRI can increase risk of serotonin syndrome. Therefore, physicians should ask patients specifically about dietary supplements, including medicinal herbs and vitamin supplements.

Drug-drug interactions in the elderly differ little from those in the general population. However, induction of cytochrome P-450 drug metabolism by certain drugs (eg, dichloralphenazone, glutethimide, rifampin) may be decreased in the elderly; therefore, the change (increase) in drug metabolism may be less pronounced in the elderly. Concurrent use of ≥ 1 drug with similar toxicity can increase risk or severity of adverse effects.

Inadequate monitoring: Monitoring drug use involves

- Documenting the indication for a new drug
- Keeping a current list of drugs used by the patient in medical records
- Monitoring for achievement of therapeutic goals and other responses to new drugs
- Monitoring necessary laboratory tests for efficacy or adverse effects
- Periodically reviewing drugs for continued need

Such measures are especially important for elderly patients. Lack of close monitoring, especially after new drugs are prescribed, increases risk of adverse effects and ineffectiveness. Criteria to facilitate monitoring have been developed by the Health Care Financing Administration expert consensus panel as part of drug utilization review criteria. The criteria focus on inappropriate dosage or duration of therapy, duplication of therapy, and possible drug-drug interactions.

Poor communication: Poor communication of medical information at transition points (from one health care setting to another) causes up to 50% of all drug errors and

[[Table 308-4](#). Drug-Disease Interactions in the Elderly]

up to 20% of adverse drug effects in the hospital. When patients are discharged from the hospital, drug regimens that were started and needed only in the hospital (eg, benzodiazepines, stool softeners, antacids) may be unnecessarily continued by another prescriber, who is reluctant to communicate with the previous prescriber. Conversely, at admission to a health care facility, lack of communication may result in unintentional omission of a necessary maintenance drug.

Lack of patient adherence: Drug effectiveness is often compromised by lack of patient adherence among the ambulatory elderly. Adherence is affected by many factors but not by age per se. Up to half of elderly patients do not take drugs as directed, usually taking less than prescribed (underadherence). Causes are similar to those for younger adults (see p. [3166](#)). In addition, the following contribute:

- Financial and physical constraints, which may make purchasing drugs difficult
- Dementia, which may make taking drugs as instructed difficult
- Use of multiple drugs
- Use of drugs that must be taken several times a day
- Lack of understanding about what a drug is intended to do

A regimen using too frequent dosing, multiple drugs, or both may be too complicated for patients to follow. Clinicians should assess patients' ability to adhere to a drug regimen (eg, dexterity, hand strength, cognition, vision) and try to accommodate their limitations—eg, by arranging for or recommending easy-access containers, drug labels and instructions in large type, containers equipped with reminder alarms, containers filled based on daily drug needs, or reminder telephone calls. Pharmacists and nurses may help by providing education and reviewing prescription instructions with elderly patients. Pharmacists may be able to identify a problem by noting whether patients obtain refills on schedule or whether a prescription seems illogical or incorrect.

Prevention

Before starting a new drug: To reduce the risk of adverse drug effects in the elderly, clinicians should do the following before starting a new drug:

- Consider nondrug treatment
- Document the indication for each new drug (to avoid using unnecessary drugs)
- Consider age-related changes in pharmacokinetics and pharmacodynamics and their effect on dosing requirements
- Choose the safest possible alternative (eg, for noninflammatory arthritis, acetaminophen instead of an NSAID)
- Check for potential drug-disease and drug-drug interactions
- Start with a low dose
- Use the fewest drugs necessary
- Note coexisting disorders and their likelihood of contributing to adverse drug effects
- Explain the uses and adverse effects of each drug
- Provide clear instructions to patients about how to take their drugs (including generic and brand names, spelling of each drug name, indication for each drug, and explanation of formulations that contain more than one drug)

- Anticipate confusion due to sound-alike drug names and pointing out any names that could be confused (eg, Glucophage and Glucovance)

After starting a drug: The following should be done after starting a drug:

- Assume a new symptom may be drug-related until proved otherwise (to prevent a prescribing cascade)
- Monitor patients for signs of adverse drug effects, including measuring drug levels and doing other laboratory tests as necessary
- Document the response to therapy and increase doses as necessary to achieve the desired effect

Ongoing: The following should be ongoing:

- Keep a current list of drugs (including OTC and dietary supplements) and periodically review it
- Evaluate the adverse effect profile for each drug
- Encourage patients to be responsible for and involved in adherence to their drug regimen
- At each move to another health care setting, review the drug list with the patient or a family member
- Use multidisciplinary interventions, including a pharmacist, as patients move from one health care setting to another
- Ensure clear, correct, and complete transfer of information when patients move from one health care setting to another

Medication reconciliation is a process that helps ensure transfer of information about drug regimens at any transition point in the health care system. The process includes identifying and listing all drugs patients are taking (name, dose, frequency, route) and comparing the resulting list with the physician's orders at a transition point. Medication reconciliation should occur at each move (admission, transfer, and discharge).

Computerized physician ordering programs can alert clinicians to potential problems (eg, allergy, need for reduced dosage in patients with impaired renal function, drug-drug interactions). These programs can also cue clinicians to monitor certain patients closely for adverse drug effects.

Drug Categories of Concern

Some drug categories (eg, analgesics, anticoagulants, antihypertensives, antiparkinsonian drugs, diuretics, hypoglycemic drugs, psychoactive drugs) pose special risks for elderly patients. Some, although reasonable for use in younger adults, are so risky as to be considered inappropriate for the elderly. The Beers Criteria are most commonly used to identify such inappropriate drugs (see [Table 308-5](#)). The Zhan expert panel further categorized some inappropriate drugs from the Beers Criteria into 3 groups:

- Always to be avoided
- Rarely appropriate
- Sometimes indicated but often misused

Analgesics: NSAIDs are used by > 30% of people aged 65 to 89, and half of all NSAID prescriptions are for people > 60. Several NSAIDs are available without prescription.

The elderly may be prone to adverse effects of these drugs, and adverse effects may be more severe because of the following:

- NSAIDs are highly soluble in lipids, and because adipose tissue increases with age, distribution of the drugs is extensive.
- Plasma protein is often decreased, resulting in higher levels of unbound drug and exaggerated pharmacologic effects.
- Renal function is reduced in many of the elderly, resulting in decreased renal clearance and higher drug levels.

Serious adverse effects include peptic ulceration and upper GI bleeding; risk is increased when an NSAID is begun and when dose is increased. Risk of upper GI bleeding increases when NSAIDs are given with warfarin, aspirin, or other antiplatelet drugs (eg, clopidogrel). NSAIDs may increase risk of cardiovascular events and can cause fluid retention and, rarely, nephropathy.

NSAIDs can also increase BP; this effect may be unrecognized and lead to intensification of antihypertensive treatment (a prescribing cascade). Thus, clinicians should keep this effect in mind when BP increases in elderly patients and ask them about their use of NSAIDs, particularly OTC NSAIDs.

Selective COX-2 (cyclooxygenase-2) inhibitors (coxibs) cause less GI irritation and platelet inhibition than other NSAIDs. Nonetheless, coxibs have a risk of GI bleeding, especially for patients taking warfarin or aspirin (even at a low dose) and for those who have had GI events. Coxibs, as a class, appear to increase risk of cardiovascular events, but risk may vary by drug; they should be used cautiously. Coxibs have renal effects comparable to those of other NSAIDs.

Lower-risk alternatives (eg, acetaminophen) should be used when possible. If NSAIDs are used in the elderly, the lowest effective dose should be used, and continued need should be reviewed frequently. If NSAIDs are used long-term, serum creatinine and BP should be monitored closely, especially in patients with other risk factors (eg, heart failure, renal impairment, cirrhosis with ascites, volume depletion, diuretic use).

Anticoagulants: Aging may increase sensitivity to the anticoagulant effect of warfarin. Careful dosing and scrupulous monitoring can largely overcome the increased risk of bleeding in elderly patients taking warfarin. Also, because drug interactions with warfarin are common, closer monitoring is necessary when new drugs are added or old ones are stopped; computer drug interaction programs should be consulted if patients take multiple drugs.

Antidepressants: Tricyclic antidepressants are effective but should rarely be used in the elderly. SSRIs and mixed serotonin/dopamine reuptake inhibitors are as effective as tricyclic antidepressants and cause less toxicity; however, there are some concerns about some of these drugs:

- Fluoxetine: A possible disadvantage is the long elimination half-life, especially of its active metabolite.
- Paroxetine: This drug is more sedating than other SSRIs, has anticholinergic effects, and, like some other SSRIs, can inhibit hepatic cytochrome P-450 2D6 enzyme activity, possibly impairing the metabolism of several drugs, including some antipsychotics, antiarrhythmics, and tricyclic antidepressants.
- Sertraline: This drug is more activating; diarrhea is a common adverse effect.

Doses of these drugs should be reduced by up to 50%. Many SSRIs are available, but data on their use in the elderly are sparse.

Antihyperglycemics: Doses of antihyperglycemics should be titrated carefully in patients with diabetes mellitus. Risk of hypoglycemia due to sulfonylureas may increase with age. Chlorpropamide is not recommended because elderly patients are at increased risk of hyponatremia due to the syndrome of inappropriate antidiuretic hormone secretion (SIADH) and because the drug's long duration of action is dangerous if adverse effects or hypoglycemia occurs. Risk of hypoglycemia is greater with glyburide than

with other oral anti-hyperglycemics because like chlorpropamide, it is eliminated by the kidneys, and clearance can be reduced when renal function is impaired.

Metformin, a biguanide excreted by the kidneys, increases peripheral tissue sensitivity to insulin and can be effective given alone or with sulfonylureas. Risk of lactic acidosis, a rare but serious complication, increases with degree of renal impairment and with patient age. Heart failure is a contraindication.

Antihypertensives: In many elderly patients, lower starting doses of antihypertensives may be necessary to reduce risk of adverse effects; however, for most elderly patients with hypertension, achieving BP goals requires standard doses and multidrug

[[Table 308-5](#). High-Risk Drugs in the Elderly (Based on the Beers Criteria)]

therapy. Initially, a thiazide-type diuretic is usually given alone or with one of the other classes shown to be beneficial (ACE inhibitors, angiotensin II receptor blockers, β -blockers, Ca channel blockers). Short-acting dihydropyridines (eg, nifedipine) may increase mortality risk and should not be used. Sitting and standing BP can be monitored, particularly when multiple antihypertensives are used, to check for orthostatic hypotension, which may increase risk of falls and fractures.

Antiparkinsonian drugs: Levodopa clearance is reduced in elderly patients, who are also more susceptible to the drug's adverse effects, particularly orthostatic hypotension and confusion. Therefore, elderly patients should be given a lower starting dose of levodopa and carefully monitored for adverse effects (see also p. [1767](#)). Patients who become confused while taking levodopa may also not tolerate newer dopamine agonists (eg, pramipexole, ropinirole). Because elderly patients with parkinsonism may be cognitively impaired, anticholinergic drugs should be avoided.

Antipsychotics: In nonpsychotic, agitated patients, antipsychotics control symptoms only marginally better than placebos and can have severe adverse effects. Antipsychotics should be reserved for psychosis.

When an antipsychotic is used, the starting dose should be about one quarter the usual starting adult dose and should be increased gradually. Clinical trial data relating to dosing, efficacy, and safety of these drugs in the elderly are limited.

Antipsychotics can reduce paranoia but may worsen confusion (see also p. [1562](#)). Elderly patients, especially women, are at increased risk of tardive dyskinesia, which is often irreversible. Sedation, orthostatic hypotension, anticholinergic effects, and akathisia (subjective motor restlessness) can occur in up to 20% of elderly patients taking an antipsychotic, and drug-induced parkinsonism can persist for up to 6 to 9 mo after the drug is stopped.

The FDA has issued a warning regarding the use of 2nd-generation (atypical) antipsychotics, once thought to be safer, in the treatment of behavioral disorders in elderly patients with dementia; a review of placebo-controlled studies has shown a higher mortality rate associated with their use. Extrapyramidal dysfunction can develop when 2nd-generation antipsychotics (eg, olanzapine, quetiapine, risperidone) are used, especially at higher doses. Risks and benefits of using an antipsychotic should be discussed with the patient or the person responsible for the patient's care.

Anxiolytics and hypnotics: Treatable causes of insomnia should be sought and managed before using hypnotics (see also p. [1707](#)). Nonpharmacologic measures and sleep hygiene (eg, avoiding caffeinated beverages, limiting daytime napping, modifying bedtime) should be tried first. If they are ineffective, nonbenzodiazepine hypnotics (eg, the imidazopyridines, alpidem and zolpidem) are options. These drugs bind mainly to a benzodiazepine receptor subtype. Imidazopyridines disturb the sleep pattern less than benzodiazepines and have a more rapid onset, fewer rebound effects, fewer next-day effects, and less potential for dependence. Short- or intermediate-acting benzodiazepines with half-lives of < 24 h (eg, alprazolam, lorazepam, oxazepam, temazepam) are preferable to long-acting benzodiazepines but may have adverse effects, including those that lead to falls and fractures.

Longer-acting benzodiazepines (eg, clonazepam, diazepam, flurazepam) should be avoided because they

have active metabolites, are likely to accumulate, and have adverse effects (eg, drowsiness, impaired memory, impaired balance leading to falls and fractures).

Duration of anxiolytic or hypnotic therapy should be limited if possible because tolerance and dependence may develop; withdrawal may lead to rebound anxiety or insomnia.

Antihistamines (eg, diphenhydramine, hydroxyzine) are not recommended as anxiolytics or hypnotics because they have anticholinergic effects.

Buspirone, a partial serotonin agonist, can be effective for general anxiety disorder; elderly patients tolerate doses up to 30 mg/day well. The slow onset of anxiolytic action (up to 2 to 3 wk) can be a disadvantage in urgent cases.

Digoxin: Digoxin, a cardiac glycoside, is used to increase the force of myocardial contractions and to treat supraventricular arrhythmias. However, it must be used with caution in patients with heart failure. In men with heart failure and a left ventricular ejection fraction of $\leq 45\%$, serum digoxin levels > 0.8 ng/mL are associated with increased mortality risk. Adverse effects are typically related to its narrow therapeutic index. One study found digoxin to be beneficial in women when serum levels were 0.5 to 0.9 ng/mL but possibly harmful when levels were ≥ 1.2 ng/mL. A number of factors increase the likelihood of digoxin toxicity in the elderly. Renal impairment, temporary dehydration, and NSAID use (all common among the elderly) can reduce renal clearance of digoxin. Furthermore, digoxin clearance decreases an average of 50% in elderly patients with normal serum creatinine levels. Also, if lean body mass is reduced, as may occur with aging, volume of distribution for digoxin is reduced. Therefore, starting doses should be low (0.125 mg/day) and adjusted according to response and serum digoxin levels (normal range 0.8 to 2.0 ng/mL). However, serum digoxin level does not always correlate with likelihood of toxicity.

Diuretics: Lower doses of thiazide diuretics (eg, hydrochlorothiazide or chlorthalidone 12.5 to 25 mg) can effectively control hypertension in many elderly patients and have less risk of hypokalemia and hyperglycemia than other diuretics (see also p. [2070](#)). Thus, K supplements may be required less often.

K-sparing diuretics should be used with caution in the elderly; the K level must be carefully monitored, particularly when these diuretics are given with ACE inhibitors.

Chapter 309. Prevention of Disease and Disability in the Elderly

Introduction

For the elderly, prevention focuses mainly on disease, frailty, accidents (ie, unintentional injury), iatrogenic complications, and psychosocial problems. Not all elderly patients benefit from every preventive measure. Choice of preventive measures is guided by the patient's general condition:

- **Healthy:** These elderly people have minimal or no chronic disease and are functionally independent. Primary and secondary prevention of disease and prevention of frailty are the most beneficial measures for this group.
- **Chronically ill:** These people typically have several noncurable but treatable diseases, are usually functionally independent or minimally dependent, often take several prescription drugs, and occasionally are hospitalized for exacerbations of their chronic diseases. Secondary and tertiary prevention of disease and prevention of frailty are priorities, as are primary prevention of disease and prevention of iatrogenic complications and accidents.
- **Frail:** These people typically have many severe chronic diseases, are functionally dependent, and have lost their physiologic reserve. They are frequently hospitalized and institutionalized. For them, prevention of accidents and iatrogenic complications is most important.

Some preventive measures apply to all elderly people. For example, exercise can help prevent frailty in healthy or chronically ill elderly people. In frail elderly people, exercise can help preserve functional ability and reduce the incidence of accidents. Influenza vaccination (yearly) and pneumococcal vaccination (needed only once, except for patients at high risk) are effective, inexpensive, and associated with minimal morbidity.

Patient and caregiver issues: Healthy elderly people should visit their primary care physician at least annually to ensure timely completion of primary and secondary disease prevention measures, including screening (see [Tables 309-1](#) and [309-2](#)) and chemoprevention (eg, vaccination, aspirin—see [Table 309-3](#)). For more information, see recommendations for clinical preventive services from the U.S. Preventive Services Task Force (USPSTF).

Medicare covers a comprehensive "Welcome to Medicare" preventive physical examination, which must occur within 6 mo of Part B enrollment.

Regular exercise (see p. [3294](#)) and a healthy diet (see [Table 309-4](#)) help prevent or postpone frailty and many diseases, as can other disease prevention measures (see [Table 309-5](#)). Chronically ill patients should learn about their diseases and treatment plans, as should their caregivers. Regular physician visits and prompt reporting of a change in symptoms can help reduce severe disease exacerbations, which can lead to hospitalization and functional decline.

Caregivers of the frail elderly must work assiduously to prevent accidents by completing a home safety checklist and correcting any potential problems that are identified. Caregivers should watch for even subtle functional changes in elderly patients and promptly report any changes to a health care practitioner. If a patient has multiple unmet needs, especially when coupled with functional decline, a caregiver should consider seeking the care of a geriatric interdisciplinary team.

Prevention of Disease

Primary and Secondary Prevention

Primary prevention aims to stop disease before it starts, often by reducing or eliminating risk factors. Primary prevention may include immunoprophylaxis (vaccinations), chemoprophylaxis, and behavioral

change (eg, via counseling). In secondary prevention, disease is detected and treated at an early stage, before symptoms or functional losses occur, thereby minimizing morbidity and mortality.

Screening can be a primary or secondary preventive measure; it can be used to detect risk factors, which may be altered to prevent disease, or to detect disease in asymptomatic people, who can then be treated early.

[[Table 309-1](#). Screening Recommendations for Elderly Patients]

Tertiary Prevention

In tertiary prevention, an existing symptomatic, usually chronic disease is appropriately managed to prevent further functional loss. Disease management is enhanced by using disease-specific practice guidelines and protocols. Several disease management programs have been developed:

- **Disease-specific care management:** A specially trained nurse, working with a primary care physician or geriatrician, coordinates protocol-driven care, arranges support services, and teaches patients.
- **Chronic care clinics:** Patients with the same chronic disease are taught in groups and are visited by a health care practitioner; this approach can help patients with diabetes achieve better glucose control.
- **Specialists:** Patients with a chronic disease that is difficult to stabilize can be referred to a specialist. This approach works best when the specialist and primary care physician work collaboratively.

Patients with the following chronic disorders, which are common among the elderly, can potentially benefit from tertiary prevention.

Arthritis: Arthritis (primarily osteoarthritis; much less commonly, RA) affects about half of people ≥ 65 . It leads to impaired mobility and increases risk of osteoporosis, aerobic and muscular deconditioning, falls, and pressure ulcers.

Osteoporosis: Tests to measure bone density can detect osteoporosis before it leads to a fracture. Ca and vitamin D supplementation, exercise, and, if needed, cessation of cigarette smoking can help prevent osteoporosis from progressing, and treatment can prevent new fractures.

Diabetes: Hyperglycemia, especially when the glycosylated hemoglobin (Hb A_{1c}) concentration is $> 7.9\%$, increases the risk of retinopathy, neuropathy, nephropathy, and coronary artery disease. The goal of treatment is an Hb A_{1c} concentration of $< 8\%$ for frail diabetic patients and an even lower

[[Table 309-2](#). Cancer Screening Recommendations for Elderly Patients]

[[Table 309-3](#). Chemoprevention and Immunization for Elderly Patients]

[[Table 309-4](#). Nutritional Recommendations for Prevention of Frailty]

concentration ($< 7\%$) for patients who are not frail or who have a remaining life expectancy > 7 yr.

Patient education and foot examinations at each visit can help prevent foot ulcers.

Vascular disorders: Elderly patients with a history of coronary artery disease, cerebrovascular disease, or peripheral vascular disease are at high risk of disabling events. Risk can be reduced by aggressive management of vascular risk factors (eg, hypertension, smoking, diabetes, obesity, atrial fibrillation, dyslipidemia).

Heart failure: Morbidity due to heart failure is significant among the elderly, and the mortality rate is higher than that of many cancers. Appropriate, aggressive treatment, especially of systolic dysfunction, reduces functional decline, hospitalization, and mortality rate.

Chronic obstructive pulmonary disease (COPD): Smoking cessation, appropriate use of inhalers and other drugs, and patient education regarding energy-conserving behavioral techniques can decrease the number and severity of exacerbations of COPD leading to hospitalization.

Prevention of Frailty

Frailty is loss of physiologic reserve, which makes people susceptible to disability due to minor stresses. Common features of frailty include weakness, weight loss, muscle wasting (sarcopenia), exercise intolerance, frequent falls, immobility, incontinence, and frequent exacerbations of chronic diseases.

Exercise (see p. [3294](#)) and a healthy diet (see [Table 309-4](#)) are recommended for preventing or reducing frailty. Elderly people who engage in regular aerobic exercise (eg, walking, swimming, running) increase their life expectancy and have less functional decline than those who are sedentary. Mood and possibly cognitive function may also be improved. Weight training can help increase bone mass and reduce risk of falls and fractures. A healthy diet may prevent or reduce risk of many diseases that contribute to frailty, including breast and colon cancers,

[[Table 309-5](#). Lifestyle Measures that Help Prevent Common Chronic Diseases]

osteoporosis, obesity, and undernutrition; morbidity and mortality may also be reduced.

Prevention of Injuries

Falls: The elderly are vulnerable to injury due to falls (see p. [3134](#)). A falls prevention program should be implemented for people who are at high risk of falls or who have already fallen.

Driving hazards: All elderly people should be reminded to use lap and shoulder belts and to refrain from driving when they are under the influence of alcohol or psychoactive drugs.

For the elderly, risk of injuring themselves and others while driving is higher than that for younger adults because of age-associated changes and conditions common among the elderly. Driving ability should be investigated with further questions and, if indicated, with formal assessment for any of the following:

- Poor visual acuity
- Dementia
- Functionally significant impairment of neck or trunk movement
- Poor motor coordination
- Bradykinesia

Also, a family member's or friend's concern about the patient's driving ability should prompt further inquiry and assessment.

Formal assessment of driving ability can be done by an occupational therapist (see p. [3152](#)). Many states have laws that mandate physician reporting of suspected impaired drivers. Sensitivity is required when a health care practitioner must recommend cessation of driving because such a recommendation threatens autonomy.

Home hazards: The home may have many hazards. For example, people with peripheral neuropathy are at increased risk of burns from excessively hot water; burns can be prevented by setting the hot water heater temperature at < 49° C. For people with dementia, using electrical and gas appliances is particularly dangerous; use of alarms and automatic shutoff features on appliances can help. Smoke and carbon monoxide detectors should be installed and maintained. Firearms should be safely stored or removed from the home.

All patients or their caregivers can complete a home safety checklist to identify hazards. Physical and occupational therapists may visit a patient's home to assess its safety.

Prevention of Iatrogenic Complications

Iatrogenic complications are more common and may be more severe among the elderly than among younger patients. These complications include adverse drug effects (eg, interactions), falls, nosocomial infections, pressure ulcers, delirium, and complications related to surgery. Prevention is often possible.

Risk Factors

The first step in prevention is to identify patients at high risk. Risk factors include the following.

Multiple chronic diseases: The greater the number of chronic diseases, the greater the risk that treatment of one disease will exacerbate others. For example, treatment of arthritis with an NSAID may exacerbate heart failure, coronary artery disease, or chronic gastritis.

Multiple physicians: Having multiple physicians can result in uncoordinated care and polypharmacy. Consultation among multiple physicians every time one of them sees a common patient is difficult. As a result, a patient's therapeutic regimen is frequently changed without the input of the patient's other physicians, thereby increasing risk of iatrogenic complications.

Multiple drugs (polypharmacy) and inappropriate drugs: Taking multiple drugs concurrently and having multiple chronic diseases markedly increase risk of adverse drug-drug or drug-disease interactions (see p. [3092](#)). Risk of such interactions is particularly high among patients who are undernourished or who have renal failure. Also, certain drugs have an especially high risk of adverse effects in the elderly (see p. [3098](#)).

Hospitalization: Risks due to hospitalization include hospital-acquired infection, polypharmacy, and transfusion reactions. Hospitalized patients who have dementia or who are immobilized (eg, after surgery) are at high risk of iatrogenic complications.

Medical technology may contribute to iatrogenic complications, including sudden death or MI after valvular replacement surgery, stroke after carotid endarterectomy, fluid overload after transfusions and infusions, unwanted prolongation of life via artificial life support, and hypoxic encephalopathy after potentially life-prolonging CPR.

Prevention

Interventions that can prevent iatrogenic complications include the following.

Care management: Care managers facilitate communication among health care practitioners, ensure that needed services are provided, and prevent duplication of services. Care managers may be employed by physician groups, health plans, or community or governmental organizations. The frail elderly benefit the most from case management.

Geriatric interdisciplinary team: A geriatric interdisciplinary team (see p. [3115](#)) evaluates all of the patient's needs, develops a coordinated care plan, and manages (or, along with the primary care physician, co-manages) care. Because this intervention is resource-intensive, it is best reserved for very complex cases.

Pharmacist consultation: A pharmacist can help prevent potential complications caused by polypharmacy and inappropriate drug use.

Acute Care for the Elderly (ACE) units: These units are hospital wards with protocols to ensure that elderly patients are thoroughly evaluated for potential iatrogenic problems before problems occur and that such problems are identified and appropriately managed.

Advance directives: Patients are encouraged to prepare advance directives, including designation of a proxy to make medical decisions (see p. [3471](#)). These documents can help prevent unwanted treatment for critically ill patients who cannot speak for themselves.

Prevention of Psychosocial Problems

Depression screening is recommended because depression is common among the elderly. Screening is relatively easy; several instruments do not require a physician for administration. For patients who feel lonely or isolated, social worker assistance to increase social contacts may prevent morbidity and postpone death. For those who are depressed, appropriate intervention with counseling or drugs is warranted.

A sense of self-worth may contribute to better health. Patients should be encouraged to remain productive, engage in leisure activities, and remain or become involved with other people. These actions can enhance self-worth. Suggesting activities that confirm a sense of social connectedness, such as obtaining a pet, contributing to household chores, or doing volunteer work, may help prevent psychosocial problems (and physical disability).

Chapter 310. Quality of Life and Therapeutic Objectives

Quality of life often depends on health and health care. However, health care practitioners, especially when establishing therapeutic objectives, may underemphasize its importance to patients.

Health-Related Quality of Life

How health affects quality of life is variable and subjective. Health-related quality of life has multiple dimensions, including the following:

- Absence of distressing physical symptoms (eg, pain, dyspnea, nausea, constipation)
- Emotional well-being (eg, happiness, absence of anxiety)
- Functional status (eg, capacity to do activities of daily living and higher-order functions, such as pleasurable activities)
- Quality of close interpersonal relationships (eg, with family members)
- Participation in and enjoyment of social activities
- Satisfaction with medical and financial aspects of treatments
- Sexuality, body image, and intimacy

Influences: Some of the factors that influence health-related quality of life (eg, institutionalization, reduced life expectancy, cognitive impairment, disability, chronic pain, social isolation, functional status) may be obvious to health care practitioners. Practitioners may need to ask about others (eg, nature and quality of close relationships, cultural influences, religion, personal values, previous experiences with health care). However, how factors affect quality of life cannot necessarily be predicted, and some factors that cannot be anticipated may have effects.

Also, perspectives on quality of life can change. For example, after a stroke that caused severe disability, patients may choose treatment (eg, life-saving surgery) to sustain a quality of life that they would have considered poor or even unacceptable before the stroke.

Assessment

Barriers to assessment: Assessing patients' perspectives on quality of life may be difficult for the following reasons:

- Such an assessment is not always taught or emphasized sufficiently in traditional medical education.
- Quality of life is subjective, so decision models cannot be applied to individual patients.
- Assessing the patient's perspectives on quality of life takes time because it requires thoughtful conversation between patient and health care practitioner.

Method: Quality of life is best assessed by a direct interview with patients. During assessment, practitioners should be careful not to reveal their own biases. Determining a patient's preferences is usually possible; even patients with mild dementia or cognitive impairment can make their preferences known when practitioners use simple explanations and questions. Having family members present when discussing preferences of a patient with cognitive impairment is recommended.

Instruments that measure health-related quality of life can be useful in research studies for assessing group trends but tend not to be useful clinically for assessing individual patients.

Therapeutic Objectives

Before a treatment or major diagnostic test is used, potential adverse effects should be weighed against potential benefits in the context of the patient's individual desires and goals.

Potential adverse effects include the following:

- Complications
- Discomfort
- Inconvenience
- Cost
- Need for additional tests or treatments

Potential benefits include the following:

- Cure
- Prolongation of life
- Slowing of disease progression
- Functional improvement
- Symptom relief
- Prevention of complications

When treatments are very likely to achieve benefits and very unlikely to have adverse effects, decisions are relatively easy. However, assessing the relative importance of these quality of life factors to each patient is important when treatments may have discordant effects. For example, aggressive cancer therapy may prolong life but have severe adverse effects (eg, chronic nausea and vomiting, mouth ulcers) that greatly reduce quality of life. In this case, the patient's preference for quality vs duration of life and tolerance for risk and uncertainty help guide the decision whether to attempt cure, prolongation of life, or palliation.

The patient's perspective on quality of life may also affect treatment decisions when different treatments (eg, surgical vs drug treatment of severe angina or osteoarthritis) may have different efficacies, toxicities, or both. Practitioners can help patients understand the expected consequences of various treatments, enabling patients to make more informed decisions.

When predicting toxicities and benefits of various treatments, practitioners should use the patient's individual clinical characteristics, rather than chronologic age alone. In general, the patient's chronologic age is irrelevant when deciding among different treatments or therapeutic goals. However, life expectancy may affect treatment choice. For example, patients with a limited life expectancy may not live long enough to benefit from aggressive treatment of a slowly progressive disorder (eg, radical prostatectomy for a localized, slow-growing prostate cancer). Nevertheless, quality of life is important regardless of life expectancy. Thus, invasive treatments that may improve quality of life (eg, joint replacement, coronary artery bypass surgery) should not be automatically rejected for patients with a limited life expectancy.

Regardless of the overall therapeutic goal, symptom relief should always be offered.

Chapter 311. Provision of Care

Introduction

Because the elderly tend to have multiple disorders and may have social or functional problems, they use a disproportionately large amount of health care resources. In the US, they account for

- > 40% of acute hospital bed days
- > 30% of prescription and 40% of OTC drug purchases
- \$329 billion or almost 44% of the national health budget
- > 75% of the federal health budget

The elderly are likely to see several health care practitioners and to move from one health care setting to another. Providing consistent, integrated care across specific care settings, sometimes called continuity of care, is thus particularly important for elderly patients. Communication among primary care physicians, specialists, other health care practitioners, and patients and their family members is critical to ensuring that patients receive appropriate care in all settings.

Health care settings: Care may be delivered in the following settings:

- **Physician's office:** The most common reasons for visits are routine chronic problems, acute problems, flare-ups of a chronic problem, preventive care, and presurgical or postsurgical evaluation.
- **Patient's home:** Home care (see p. [3116](#)) is most commonly used after hospital discharge, but hospitalization is not a prerequisite.
- **Long-term care facilities:** These facilities include assisted-living facilities, board-and-care facilities, nursing homes, and life-care communities (see p. [3122](#)). Whether patients require care in a long-term care facility depends partly on the patient's wishes and needs and on the family's ability to meet the patient's needs.
- **Day care facilities:** These facilities provide medical, rehabilitative, cognitive, and social services several hours a day for several days a week.
- **Hospitals:** Only seriously ill elderly patients should be hospitalized (see p. [3118](#)). Hospitalization itself poses risks to elderly patients because of confinement, immobility, diagnostic testing, and treatments.
- **Hospice:** Hospices provide care for the dying (see p. [3482](#)). The goal is to alleviate symptoms and keep people comfortable rather than to cure a disorder. Hospice care can be provided in the home, a nursing home, or a separate inpatient facility.

In general, the lowest, least restrictive level of care suitable to a patient's needs should be used. This approach conserves financial resources and helps preserve the patient's independence and functioning.

Geriatric Interdisciplinary Teams

Geriatric interdisciplinary teams consist of practitioners from different disciplines who provide coordinated, integrated care with collectively set goals and shared resources and responsibilities.

Not all elderly patients need a geriatric interdisciplinary team. However, if patients have complex medical, psychologic, and social needs, such teams are more effective in assessing patient needs and creating an effective care plan than are practitioners working alone. For these patients, care is often best managed by a geriatrician. Interdisciplinary care is not available everywhere.

Interdisciplinary teams aim to ensure the following:

- That patients move safely and easily from one care setting to another and from one practitioner to another
- That the most qualified practitioner provides care for each problem
- That care is not duplicated

To create, monitor, or revise the care plan, interdisciplinary teams must communicate openly, freely, and regularly. Core team members must collaborate, with trust and respect for the contributions of others, and coordinate the care plan (eg, by delegating, sharing accountability, jointly implementing it). Team members may work together at the same site, making communication informal and expeditious.

A team typically includes physicians, nurses, pharmacists, social workers, and sometimes a dietitian, physical and occupational therapists, an ethicist, or a hospice physician. Team members should have knowledge of geriatric medicine, familiarity with the patient, dedication to the team process, and good communication skills.

To function effectively, teams need a formal structure. Teams should set deadlines for reaching their goals, have regular meetings (to discuss team structure, process, and communication), and continuously monitor their progress (using quality improvement measures). In general, team leadership should rotate, depending on the needs of the patient; the key provider of care reports on the patient's progress. For example, if the main concern is the patient's medical condition, a physician leads the meeting and introduces the team to the patient and family members. The physician determines what medical conditions a patient has, informs the team (including differential diagnoses), and explains how these conditions affect care. The team's input is incorporated into medical orders. The physician must write medical orders agreed on through the team process and discusses team decisions with the patient, family members, and caregivers.

If a formally structured interdisciplinary team is not available or practical, a virtual team can be used. Such teams are usually led by the primary care physician but can be organized and managed by an advanced practice nurse, a care coordinator, or a case manager. The virtual team uses information technologies (eg, handheld devices, email, video conferencing, teleconferencing) to communicate and collaborate with team members in the community or within a health care system.

Patient and caregiver participation: Practitioner team members must treat patients and caregivers as active members of the team—eg, in the following ways:

- Patients and caregivers should be included in team meetings when appropriate.
- Patients should be asked to help the team set goals (eg, advance directives, end-of-life care).
- Patients and caregivers should be included in discussions of drug treatment, rehabilitation, dietary plans, and other therapies.
- Patients should be asked what their ideas and preferences are; thus, if patients will not take a particular drug or change certain dietary habits, care can be modified accordingly.

Patients and practitioners must communicate honestly to prevent patients from suppressing an opinion and agreeing to every suggestion.

Caregivers, including family members, can help by identifying realistic and unrealistic expectations based on the patient's habits and lifestyle. Caregivers should also indicate what kind of support they can provide.

Home Health Care

Usually, home health care is indicated when patients need monitoring, adjustment of drugs, dressing

changes, and limited physical therapy. Home health care is commonly used

- After hospital discharge (postacute care), although hospitalization is not a prerequisite, particularly for the elderly

Home health care can also be used for

- Patients with conditions that require many days of hospitalization each year (medically complex care)
- Medically stable patients with severe functional impairment (long-term care)

Home health care is being increasingly used to meet the demand for long-term care. Home health care, which can reduce nursing home placement of patients by 23%, is less expensive than institutional care when home health aide and skilled care visits are scheduled appropriately.

Home health care is provided by agencies, which vary in ownership, size, location, and services. Some are certified. To be certified, an agency must meet state licensing requirements and federal conditions for participation in Medicare. Such agencies provide skilled nursing care under the direction of referring physicians. Nurses provide services under the supervision of a physician, who consults with them as changes in care are needed. Caring for patients at home requires communication among health care practitioners to ensure that patients are maintaining function and are progressing as expected. The patients or caregivers need to promptly report changes in the patient's condition to nurses or physicians to ensure that patients are monitored appropriately.

Home health care may provide medical and nonmedical services (see [Table 311-1](#)).

Reimbursement: Few patients with a serious, chronic disorder can afford full home care even though most would prefer to remain at home. Medicare covers some home care services for patients who are homebound, but it has certain requirements, which depend on the Medicare option chosen (see p. [3155](#)). Some private insurance companies cover some home health care services (eg, infusion services) for patients who are not homebound.

For patients' care to be reimbursed by a third party, physicians must certify that home care is required and, for Medicare, that patients meet Medicare requirements for home care. Medicare requires that home health care agencies tell patients which services are reimbursable. Home care services that are delivered are based on a detailed assessment (Outcome and Assessment Information Set [OASIS]) that is completed by a registered nurse or therapist when the patient is admitted to Medicare. Third-party payers are increasingly limiting personal services to control costs. Home health care agencies are directly reimbursed by Medicare, Medicaid, or private insurers.

[[Table 311-1](#). Services that May be Provided in Home Health Care]

Day Care

Day care provides medical, rehabilitative, and cognitive support services several hours a day for several days a week. All day care facilities provide certain core services: transportation, nutrition, and recreational and social activity programs. In the US, there are only about 2,900 day care programs compared with > 16,000 nursing homes. Most day care programs are small, averaging 20 clients.

There are several models.

- **Day hospital:** This model emphasizes rehabilitation or intensive skilled care. It is designed for patients recovering from an acute condition (eg, stroke, amputation, fracture). Programs are usually limited in duration (6 wk to 6 mo) and are costly because the ratio of staff members to patients is high.
- **Maintenance:** This model combines limited skilled care (screening for and monitoring of chronic disorders) with physical exercise. Goals are to prevent deterioration, to maintain or improve the patient's

functional level for as long as possible, to improve self-image, to eliminate the monotony of daily life, to prevent exacerbation of chronic disorders, and to prevent loneliness, isolation, and withdrawal. Maintenance programs provide long-term care and are less costly than day hospital programs.

- **Social:** This model provides counseling, group therapy, and cognitive retraining. It may resemble a typical senior citizens' center, which provides care to elderly people with various psychosocial needs, or a mental health center, which provides care to elderly people with dementia or psychiatric disorders.

Programs are increasingly accepting patients who are in wheelchairs and those who are incontinent; however, patients cannot be socially disruptive. Care may be long-term or limited in duration.

In addition to providing needed medical care, these facilities also provide respite care. By doing so, they may help delay or avoid placement in a nursing home.

Reimbursement: Medicare does not reimburse for day care services. Funds generally come from the Older Americans Act, Medicaid waiver programs, long-term care insurance, and private funds. Some centers use donated funds to subsidize transportation and a sliding-fee scale to match aid with the patient's financial need.

Respite Care

Respite care is provision of temporary care by a substitute caregiver to provide relief to the regular caretaker. Over 50% of US states have respite programs. Programs may be provided in different settings:

- In the home by respite care agencies or by home health care agencies
- In the community by adult day care centers, respite care cooperatives, or freestanding respite facilities
- In a long-term care facility (eg, by board-and-care facilities or nursing homes)
- In a hospital

Duration of care may vary (eg, limited to 28 days in a calendar year).

Support comes from Medicaid (almost 50%), grants (25%), and private funds (25%).

Hospital Care

A hospital may provide emergency medical care, diagnostic testing, intensive treatment, or surgery, which may or may not require admission. The elderly use hospitals more than younger patients; they have more admissions to the hospital from the emergency department and more and longer hospital stays, and they use more resources while in the hospital.

Emergency Department Care

In 2006, about 14.5% of emergency department visits were made by people ≥ 65 yr. Elderly patients tend to be sicker. More than 40% of elderly patients seen in an emergency department are admitted to the hospital; 6% go to intensive care units. More than 50% are prescribed new drugs. The elderly may use the emergency department as a substitute for primary care or may come because they are not receiving adequate care from their primary care physician. However, in most cases, the reasons for coming are true emergencies.

A visit to an emergency department may create more stress for the elderly because there are typically no special accommodations for them (eg, quiet rooms, lower beds, extra pillows, indirect lighting).

Evaluation of the elderly usually takes longer and requires more diagnostic tests because many elderly patients do not present with clear-cut or typical symptoms and signs of a disorder (see p. [3088](#)). For example, MI manifests as chest pain in $< 50\%$ of patients > 80 yr. Instead, elderly patients may complain

of feeling generally weak or just not feeling themselves.

Factors that are not apparent (eg, polypharmacy, adverse drug effects) may affect an elderly patient's presentation. For example, a fall may result from elder abuse, an adverse drug effect (eg, oversedation), hazards in the home, physical problems (eg, poor vision), depression, or chronic alcoholism. Adverse drug effects account for at least 5% of hospital admissions for the elderly.

About 30 to 40% of elderly patients who come to the emergency department are cognitively impaired but do not have a diagnosis of dementia; in 10%, cognitive impairment consistent with delirium is unrecognized. When indicated (eg, if an elderly patient is having difficulty with orientation to person, place, or time), a standardized cognitive assessment should be done in the emergency department. However, a standardized cognitive assessment is appropriate for any elderly patient coming to the emergency department. Cognitive impairment affects the reliability of the patient history, as well as diagnosis, and must be considered when planning the patient's disposition. Knowing whether onset of cognitive impairment is recent helps determine whether the impairment should be fully assessed in the emergency department. Cognitive impairment of recent onset may indicate sepsis, occult subdural hemorrhage, or an adverse drug effect.

Suicide risk, incontinence, and nutritional and immunization status should be assessed in the emergency department so that follow-up care can be arranged.

Communication among practitioners: Good communication among emergency department physicians and patients, caregivers, primary care physicians, and staff members of long-term care facilities greatly enhances the outcome of elderly patients with complicated problems. Advance directives should be promptly and clearly communicated to emergency medicine practitioners. Baseline information from the patient's personal physician facilitates assessment and management planning in the emergency department. Reports to the patient's primary care physician should describe even simple injuries (eg, ankle sprain, Colles' wrist fracture) because such injuries can dramatically affect functional ability and independence.

Disposition: Discharge planning may be complex because acute illness or injury may impair functional ability more in elderly patients (eg, a simple ankle sprain may be incapacitating unless patients have good support at home). Discharge planning may be improved when nurses, social workers, and primary care physicians are involved. It should include the following:

- Functional status assessment (see p. [3079](#))
- Strategies to manage problems (eg, depression, alcoholism, impaired functional status) identified during the emergency department assessment
- Determination of whether patients can take drugs as directed and can obtain the necessary follow-up care
- Assessment of caregiver capabilities (eg, whether respite services are needed)

Many elderly patients are hospitalized after they are evaluated in the emergency department.

Occasionally, elderly patients are brought to the emergency department by a caregiver who refuses to take them home or who leaves, abandoning them in the hospital.

Hospitalization

Almost half of adults who occupy hospital beds are ≥ 65 yr; this proportion is expected to increase as the population ages. Hospital care costs Medicare > \$100 billion/yr, representing 30% of health care expenditures for hospital care in the US.

Hospitalization can magnify age-related physiologic changes and increase morbidity.

Only seriously ill elderly patients who cannot be appropriately cared for elsewhere should be hospitalized. Hospitalization itself poses risks to elderly patients because it involves confinement, immobility, diagnostic testing, and treatments (particularly changes in drug regimens). When patients are transferred to or from a hospital, drugs are likely to be added or changed, leading to a higher risk of adverse effects (see p. [3095](#)). Treatment in hospitals can be dehumanizing and impersonal. Acute hospital care should last only long enough to allow successful transition to home care, a skilled nursing facility, or an out-patient rehabilitation program.

The outcome of hospitalization appears to be poorer with increasing age, although physiologic age is a more important predictor of outcome than is chronologic age. Outcome is better for patients hospitalized because of elective procedures (eg, joint replacement) than for those hospitalized because of serious disorders (eg, multisystem organ failure).

About 75% of patients who are ≥ 75 and functionally independent at admission are not functionally independent when they are discharged; 15% of patients ≥ 75 are discharged to skilled nursing facilities. The trend toward abbreviated acute hospital stays followed by subacute care and rehabilitation in a skilled nursing facility may explain why these percentages are high. However, even when a disorder is treatable or appears uncomplicated, patients may not return to prehospital functional status.

Improving outcomes: The following strategies can help reduce functional decline and improve care of elderly patients:

- **Geriatric interdisciplinary team:** To identify and meet the complex needs of elderly patients and to watch for and prevent problems that are common among the elderly and that may develop or worsen during hospitalization (see p. [3115](#))
- **Primary care nurse** (one nurse with around-the-clock responsibility for a particular patient): To administer the team's care plan, to monitor response to nursing and medical care, and to teach and counsel patients, staff members, and family members
- **Changes in the hospital environment, often made by nurses:** Eg, to move disruptive patients into the hall near the nursing station or to change roommates for a patient
- **Rooming-in programs for a family member:** To provide better one-on-one care, to relieve staff members of some caregiving tasks, to allay patient anxiety (particularly if patients have delirium or dementia), and to enable a family member to participate actively in the patient's recovery
- **Good communication among practitioners:** To prevent errors in and duplication of diagnostic procedures and treatments (particularly drugs)
- **Documentation of drug regimen:** To state the indication for each new drug, to maintain a daily list of drugs prescribed and received, and thus to avoid using unnecessary drugs and help prevent drug interactions
- **Advance directives:** To document the patient's choice of health care proxy and health care decisions (see p. [3471](#))
- **Consideration of problems common among the elderly:** To anticipate and take steps to prevent such problems and to treat them promptly
- **Discharge planning:** To ensure that appropriate care is continued

Advance directives, if already prepared, should be brought to the hospital as soon as possible. Practitioners should reaffirm these choices during acute hospitalization. If directives were not documented, practitioners should make every effort to determine the patient's wishes.

Problems common among the elderly require specific consideration during hospitalization, particularly after surgery (see p. [3448](#)); many of them can be remembered using the acronym ELDERSS (see

[Table 311-2](#)). In the hospital, elderly patients frequently experience nighttime confusion (sundowning), fracture a bone with no identifiable trauma, fall, or become unable to walk. Hospitalization may precipitate or worsen undernutrition, pressure ulcers, urinary incontinence, fecal impaction, and urinary retention. Such problems can prolong convalescence.

[\[Table 311-2. Elderss: Some Important Issues for the Hospitalized Elderly\]](#)

Adverse Drug Effects

Hospitalization rates due to adverse drug effects are 4 times higher for elderly patients ($\approx 17\%$) than for younger patients (4%). Reasons for these effects include polypharmacy, age-related changes in pharmacokinetics and pharmacodynamics, and changes in drugs (intentional and unintentional) during hospitalization and at discharge (see [Ch. 308](#)).

Prevention: Maintaining a daily list of drugs prescribed and received can help prevent adverse drug effects and drug interactions.

Because drug distribution, metabolism, and elimination vary widely among elderly patients, the following should be done:

- Drug doses should be carefully titrated.
- Creatinine clearance for renally excreted drugs should be calculated when doses are adjusted.
- Serum drug levels should be measured.
- Patient responses should be observed.

Certain drugs or drug categories should be avoided in the elderly (see p. [3098](#)). Use of hypnotic drugs should be minimized because tachyphylaxis may occur and risk of falls and delirium is increased. Short-acting benzodiazepines are usually the best choice. Antihistamines have anticholinergic effects and should not be used for sedation.

Bed Rest Effects

Prolonged bed rest, as can occur during hospitalization, causes deconditioning and is seldom warranted. The resulting inactivity has the following effects:

- With complete inactivity, muscle strength decreases by 5% per day, increasing risk of falls.
- Muscles shorten and periarticular and cartilaginous joint structure changes (most rapidly in the legs), limiting motion and contributing to development of contractures.
- Aerobic capacity decreases markedly, substantially reducing maximum O₂ uptake.
- Bone loss (demineralization) is accelerated.
- Risk of deep venous thrombosis is increased.

After even a few days of bed rest, elderly patients who have reduced physiologic reserves but can still function independently may lose that ability. Even if the loss is reversible, rehabilitation requires extensive, expensive, and relatively lengthy intervention.

In elderly patients, bed rest can cause vertebral bone loss 50 times faster than in younger patients. The loss incurred from 10 days of bed rest takes 4 mo to restore.

Prevention: Unless prohibited for a specific reason, activity (particularly walking) should be encouraged. If assistance with walking is needed, therapists provide it at scheduled times. However, physicians,

nurses, and family members should also assist patients with walking throughout the day. Hospital orders should emphasize the need for activity.

If immobilization is necessary or results from prolonged illness, procedures to prevent deep venous thrombosis are recommended unless contraindicated.

Rehabilitation is often needed. Realistic goals for rehabilitation at home can be based on the patient's prehospitalization activity level and current needs.

Falls

Age-related changes (eg, baroreceptor insensitivity, decreased body water and plasma volume) result in a tendency to develop orthostatic hypotension. These changes plus effects of bed rest and use of sedatives and certain antihypertensives increase risk of falls (and syncope).

Among hospitalized elderly patients, > 60% of falls occur in the bathroom; often, patients hit hard objects. Some patients fall while getting out of hospital beds. Patients are in a strange bed and in a strange environment, and they may easily become confused. The use of bed rails may help remind elderly patients to call for assistance before attempting to get up, but bed rails may also act as a physical barrier that contributes to patient falls.

Prevention: Usually, bed rails should be removed or kept down. The best alternatives to the use of physical or chemical restraints are to identify, carefully analyze, and modify or correct risk factors for falling (including agitation) and to closely observe patients at risk.

Incontinence

Urinary or fecal incontinence develops in > 40% of hospitalized patients \geq 65, often within a day of admission. Reasons include

- An unfamiliar environment
- A cluttered path to the toilet
- Disorders that impair ambulation
- A bed that is too high
- Bed rails
- Hampering equipment such as IV lines, nasal oxygen lines, cardiac monitors, and catheters
- Psychoactive drugs that may reduce the perception of the need to void, inhibit bladder or bowel function, or impair ambulation
- Drugs that may result in urinary incontinence (eg, anticholinergic drugs and opioids, causing overflow urinary incontinence; diuretics, causing urge incontinence)

Bedpans may be uncomfortable, especially for postsurgical patients or patients with chronic arthritis. Patients with dementia or a neurologic disorder may be unable to use the call bell to request toileting assistance.

Fecal impaction, GI tract infection (eg, *Clostridium difficile*-induced colitis), adverse effects of drugs, and liquid nutritional supplements may cause uncontrollable diarrhea.

With appropriate diagnosis and treatment, continence can be reestablished, and nursing home placement avoided.

Mental Status Changes

Elderly patients may appear confused because they have dementia, delirium, depression, or a combination. However, health care practitioners must always remember that confusion may have other causes, and its presence requires thorough evaluation.

Confusion may be due to a specific disorder (see [Table 175-2](#) on p. [1670](#)). However, it may develop because the hospital setting exacerbates the effects of acute illness and age-related changes in cognition. For example, elderly patients who do not have their eye-glasses and hearing aids may become disoriented in a quiet, dimly lit hospital room. Patients may also become confused by hospital procedures, schedules (eg, frequent awakenings in strange settings and rooms), the effects of psychoactive drugs, and the stress of surgery or illness. In an ICU, the constant light and noise can result in agitation, paranoid ideation, and mental and physical exhaustion.

Prevention: Family members can be asked to bring missing eyeglasses and hearing aids. Placing a wall clock, a calendar, and family photographs in the room can help keep patients oriented. The room should be lit well enough to enable patients to recognize what and who is in their room and where they are. At every opportunity, staff and family members should remind patients of the time and place. Procedures should be explained before and as they are done.

Use of physical restraints is discouraged. For agitated patients, restraints invariably increase the level of agitation. Identifying and modifying risk factors for agitation and closely observing patients can help prevent or minimize it.

Pressure Ulcers

Pressure ulcers often develop in elderly hospitalized patients because of age-related changes in the skin. Direct pressure may cause skin necrosis in as few as 2 h if the pressure is greater than the capillary perfusion pressure of 32 mm Hg. During a typical emergency department visit, pressure ulcers can start developing while elderly patients are lying on a hard stretcher waiting to be examined. After short periods of immobilization, sacral pressures reach 70 mm Hg, and pressure under an unsupported heel averages 45 mm Hg. Shearing forces result when patients sitting in wheelchairs or propped up in beds slide downward. Incontinence, poor nutrition, and chronic disorders may contribute to pressure ulcer development.

Prevention: A protocol to prevent and treat pressure ulcers should be started immediately, at admission (see p. [742](#)). It should be followed daily by the patient's primary care nurse and reviewed at least weekly by an interdisciplinary team. Pressure ulcers may be the only reason patients are discharged to a nursing home rather than to the community.

Undernutrition

In the hospital, elderly patients can become undernourished quickly, or they may be undernourished when admitted. Prolonged hospitalization exacerbates preexisting problems and often results in significant nutritional loss. Undernutrition is particularly serious for hospitalized patients because it makes them less able to fight off infection, maintain skin integrity, and participate in rehabilitation; surgical wounds may not heal as well.

Hospitalization contributes to undernutrition in several ways:

- Rigidly scheduled meals, use of drugs, and changes in environment can affect appetite and nutritional intake.
- Hospital food and therapeutic diets (eg, low-salt diets) are unfamiliar and often unappetizing.
- Eating in a hospital bed with a tray is difficult, particularly when bed rails and restraints limit movement.
- Elderly patients may need help with eating; help may be slow to come, resulting in cold, even less

appetizing food.

- The elderly may not drink enough water because their thirst perception is decreased, water is difficult to reach, or both; severe dehydration may develop (sometimes leading to stupor and confusion).
- Dentures may be left at home or misplaced, making chewing difficult; labeling dentures helps prevent them from being lost or discarded with the food tray.

Prevention: Patients with preexisting nutritional abnormalities should be identified when admitted and be treated appropriately. Physicians and staff members should anticipate nutritional deficiencies in elderly patients.

The following measures can help:

- Rescinding restrictive dietary orders as soon as possible
- Monitoring nutritional intake daily
- Conferring with patients and family members about food preferences and attempting to tailor a reasonable diet specific to each patient
- Encouraging family members to join the patient at mealtimes because people eat more when they eat with others
- Making sure patients are fed adequately at all times (eg, temporary or permanent parenteral nutrition or GI tube feedings for patients too sick to swallow)
- Giving explicit oral fluid orders (eg, providing a fresh and readily accessible bedside water pitcher or other fluids unless fluids are restricted; advising family members, friends, and staff members to regularly offer patients a drink)

Discharge Planning and Transfers

Early, effective discharge planning has many benefits:

- Shortening the hospital stay
- Reducing the likelihood of readmission
- Identifying less expensive care alternatives
- Facilitating placement of equipment (eg, hospital bed, O₂) in the patient's home
- Helping increase patient satisfaction
- Possibly preventing placement in a nursing home

As soon as a patient is admitted, all members of the interdisciplinary team begin discharge planning. A social worker or discharge planning coordinator evaluates the patient's needs within 24 h of admission. Nurses help physicians determine when discharge is safe and which setting is most appropriate.

To home: Patients being discharged to their home need detailed instructions about follow-up care, and family members or other care-givers may need training to provide care. If patients and family members are not taught how to give drugs, implement treatment, and monitor recovery, adverse outcomes and readmission are more likely. Writing down follow-up appointments and drug schedules may help patients and family members. At discharge, a copy of a brief discharge summary plan should be given to patients or family members in case they have questions about care before the primary care physician receives the official summary plan.

To another health care facility: When a patient is discharged to a nursing home or to another facility, a written summary should be sent with the patient, and a copy should be faxed to the receiving institution. The summary must include complete, accurate information about the following:

- The patient's mental and functional status
- Times the patient last received drugs
- List of drugs being currently taken and the dosage
- Known drug allergies
- Advance directives, including resuscitation status
- Family contacts and support status
- Follow-up appointments and tests
- Names and phone numbers of a nurse and physician who can provide additional information

A written copy of the patient's medical and social history should accompany the patient during transfer and may be sent via fax to the receiving facility to ensure that there are no information gaps.

Effective communication between staff members of institutions helps ensure continuity of care. For example, the patient's nurse can call the receiving institution to review the information shortly before the patient is transferred and can call the nurse who will care for the patient after discharge.

Long-Term Care

Determining which setting for long-term care is best depends on

- The patient's wishes and medical, social, emotional, and financial needs
- The family's ability to meet the patient's needs
- The setting's capacity for achieving patient goals established by the referring physician

Placement in a nursing home may be unnecessary if community-based long-term care services (eg, independent housing for the elderly, board-and-care facilities, assisted living, life-care communities) are available, accessible, and affordable.

Nursing Homes

The term nursing home refers specifically to a skilled nursing facility. Nursing homes, or skilled nursing facilities (SNFs), provide daily skilled nursing care, skilled rehabilitation services, and other medical services for people ≥ 65 yr (and for younger disabled people—see [Table 311-3](#)). Many nursing homes also provide additional community-based services (eg, day care, respite care). Many provide short-term postacute care (including intensive physical, occupational, respiratory, and speech therapy) after an injury or illness (eg, hip fracture, MI, stroke). Hospitals (including rural hospitals with swing-beds) or freestanding facilities that may or may not be affiliated with a hospital may act as nursing homes.

The percentage of people in nursing homes has declined, partly because assisted-living facilities and home health care, which depend substantially on informal caregiving, are being used more.

About 45% of people ≥ 65 spend some time in a nursing home; of these, $\geq 50\%$ stay ≥ 1 yr, and a minority of these die there. The probability of nursing home placement within a person's lifetime is closely related

to age; for people aged 65 to 74, the probability is 17%, but for those > 85, it is 60%. Projections indicate that 43% of people who turned 65 in 1990 will spend some time in a nursing home before they die, and > 50% of those admitted will spend at least 1 yr.

[[Table 311-3](#). Nursing Homes at a Glance]

However, twice as many functionally dependent elderly live in the community as in nursing homes. About 25% of all community-dwelling elderly have no family members to help with their care. Special attention to health and health care needs of the community-dwelling elderly could add quality and years to their life and limit costs by preventing institutionalization.

Supervision of care: Physicians must see nursing home patients as often as medically necessary but not less than every 30 days for the first 90 days and at least once every 60 days thereafter. During routine visits, patients should be examined, drug status assessed, and laboratory tests ordered as needed. Findings must be documented in the patient's chart to keep other staff members informed. Some physicians limit their practice to nursing homes. They are available to participate in team activities and to consult with other staff members, thus promoting better care than that given in hurried visits every other month. Some nurse practitioners and physicians collaborate to manage patients' disorders. By administering antibiotics and monitoring IV lines, suctioning equipment, and sometimes ventilators, nurse practitioners may help prevent patients from being hospitalized.

Detecting, stopping, and preventing abuse is a primary function of physicians, nurses, and other health care practitioners. All practitioners involved in care of the elderly should be familiar with signs of abuse or neglect and be ready to intervene if elder abuse is suspected. A public advocacy system exists, and nursing homes can be cited by regulatory agencies.

The federal and state governments are legally responsible for ensuring that a facility is providing good care; surveyors attempt to assess a facility's performance and to detect deficiencies by monitoring outcome measures, observing care, interviewing patients and staff members, and reviewing clinical records.

Hospitalization: If hospitalization becomes necessary and if possible, the physician who cares for a patient in the nursing home should treat that patient in the hospital. However, hospitalization is avoided whenever possible because of its risks (see p. [3118](#)).

When patients are transferred to a hospital, their medical records should accompany them. A phone call from a nursing home nurse to a hospital nurse is useful to explain the diagnosis and reason for transfer and to describe the patient's baseline functional and mental status, drugs, and advance directives. Similarly, when patients are returned to the nursing home from the hospital, a hospital nurse should call a nursing home nurse.

Costs: Nursing home care is expensive, averaging \$68,280 per year in 2004. In the US, nursing home care cost \$21 billion in 1980, \$70 billion in 2000, and \$121.9 billion in 2005. About 44% of the cost is paid by Medicaid, 26.5% by the patient, 16% by Medicare, 7.5% by private insurance, and about 4% by other private funds.

Problems related to reimbursement: Critics suggest the following:

- The rate of reimbursement may be too low, limiting patient access to rehabilitation and services that enhance quality of life, especially for patients with dementia.
- Financial incentives to provide restorative care and rehabilitation for patients with limited functioning may be insufficient.
- Nursing homes may be motivated to foster dependence or to maintain the need for high-level care so that reimbursement is maximized.

Nursing home placement: A patient's preferences and needs can be determined most effectively

through comprehensive geriatric assessment, including identification and evaluation of all disorders and evaluation of the patient's functional ability (see p. [3086](#)). Disabling or burdensome disorders—most commonly dementia, incontinence, and immobility—may trigger consideration of nursing home placement. However, even modest amelioration of a disorder may forestall the need for a nursing home (see [Table 311-4](#)).

Selection: Nursing homes vary in the types of medical, nursing, and social services provided. Some states set minimum nurse-to-patient ratios that are more stringent than federal requirements; the ratio of other staff members to patients varies considerably.

Physicians should help families select a nursing home that matches the needs of the patient with the services of a nursing home. Physicians should consider the following:

- Which clinical care practice model the nursing home uses (eg, private single-physician practices, large networks of primary care practitioners who routinely visit a certain set of nursing homes)
- Which hospitals have transfer agreements with the nursing home
- Which special therapeutic services, palliative care, hospice, and other services are available
- Whether staff members are employed full-time or part-time
- What the patient's medical coverage is, particularly if it is a Medicare capitated program, which covers certain aspects of ongoing medical care but does not cover long-term custodial care

Board-and-Care Facilities

Board-and-care facilities provide care for elderly people who cannot live independently but who do not need the constant supervision provided in nursing homes. Board-and-care facilities (also called rest homes) typically provide the following:

- A room
- Meals in a communal dining room
- Housekeeping services (eg, laundry, cleaning)
- Minimal assistance with personal care
- Sometimes supervision of drug administration

The number of board-and-care facilities is increasing because they offer an economic, federally funded means of accommodating the increasing number of elderly people who would otherwise require nursing home care paid for with state Medicaid funds.

Minimally regulated and sometimes unlicensed, these facilities principally serve 2 groups, often cared for together—the elderly and the deinstitutionalized mentally ill. Although excellent homes exist, some facilities tend to warehouse the disabled in substandard buildings and to employ few skilled staff members.

Physicians should try to ensure that their patients in board-and-care facilities are safe and are receiving appropriate care. Physicians may need to visit the facility or send a nurse or social worker to evaluate it.

Assisted-Living Programs

Assisted-living programs enable residents who have problems doing activities of daily living to maintain their independence in

[Table 311-4. Strategies for Avoiding Nursing Home Placement]

personalized settings by providing or arranging for the provision of daily meals, personal and other supportive services, health care, and 24-h oversight as needed.

Assisted-living programs typically provide the following:

- Meals
- Personal care
- Housekeeping services
- Transportation
- 24-h oversight if needed

These programs are paid for by private funds, long-term care insurance, community-based charity organizations, or church groups.

Life-Care Communities

Life-care communities offer a contract intended to remain in effect for the resident's lifetime and, at a minimum, to guarantee shelter and access to various health care services.

Life-care communities (continuing care retirement communities) offer different levels of care:

- For people who can live independently
- For those who need assistance
- For those who need skilled nursing care

Generally, people pay a substantial entrance fee (\$50,000 to \$500,000) when moving to the community and monthly fees thereafter. In some communities, residents pay only a monthly fee for rent plus service or health packages. In others, residents can purchase a condominium, cooperative, or membership; service or health packages are purchased separately.

There are 3 main types of communities:

- Those covered by an all-inclusive contract
- Those covered by a modified contract limiting the amount of long-term care provided before the monthly fee is increased
- Those covered by a fee-for-service contract with billing for health services as they are used

If well financed and managed, life-care communities provide a broad range of housing, social, supportive, and health services that enable their residents to live comfortably. However, some communities are not well regulated; in some, residents' assets have been wiped out because of unscrupulous real estate dealers or well-intentioned but inept management.

Communities may occupy a single building or be spread across multiacre campuses with housing options ranging from efficiency apartments to cottages with several rooms. Many have community buildings for organized social events, dining rooms, clubs, sports facilities, planned outings, and vacation options. Access to physicians is usually provided, and most programs are affiliated with local acute care facilities.

Program of All-Inclusive Care for the Elderly

Program of All-Inclusive Care for the Elderly (PACE) is designed for elderly people who meet criteria for nursing home admission but wish to live at home as long as possible. The program involves an interdisciplinary team that includes physicians, nurses, physical and occupational therapists, social workers, dietitians, and drivers. The services are typically provided in an adult day health center and are available every day. The program provides transportation to the center. However, some services may be provided in the home.

PACE is available only in certain areas of the country. It combines funds from Medicare and Medicaid. The Department of Health and Human Services web site explains the PACE program and provides an up-to-date list of participating health care practitioners.

Pharmacy

For elderly patients, developing a relationship with a pharmacist and using one pharmacy can help ensure consistency in care. A pharmacist can help prevent drug-related problems, which are a particular risk for the elderly (see [Ch. 308](#)).

For elderly patients, pharmacists are often the most accessible health care practitioner. In addition to dispensing drugs, pharmacists provide drug information to patients, monitor drug use (including adherence), and liaise between physicians or other health care practitioners and patients to ensure optimal pharmaceutical care. Pharmacists also provide information about interactions between drugs and other substances, including OTC drugs, dietary supplements (eg, medicinal herbs), and foods.

Patient adherence: Pharmacists can help improve patient adherence by doing the following:

- Assessing the patient's ability to adhere to a drug regimen by noticing certain impairments (eg, poor dexterity, lack of hand strength, cognitive impairment, loss of vision)
- Teaching patients how to take certain drugs (eg, inhalers, transdermal patches, injectable drugs, eye or ear drops) or how to measure doses of liquid drugs
- Supplying drugs in ways that are accessible to patients (eg, easy-open bottles, pills without wrappers)
- Making sure that drug labels and take-home printed materials are in large type and in the patient's native language
- Teaching patients how to use drug calendar reminders, commercially available drug boxes, electronic drug-dispensing devices, and pill splitters or crushers
- Eliminating unnecessary complexity and duplication from the overall drug regimen

Settings: Many pharmacists work in a community pharmacy. But they may also work in any health care setting, including hospitals, long-term care facilities, the home (with a home health care agency), mail service and online pharmacies, organized health care systems, and hospice settings (see [Table 311-5](#)).

[[Table 311-5](#). Various Duties of Pharmacists]

Chapter 312. Gait Disorders in the Elderly

Introduction

Gait disorders encompass a number of issues, including slowing of gait speed and loss of smoothness, symmetry, or synchrony of body movement.

For the elderly, walking, standing up from a chair, turning, and leaning are necessary for independent mobility. Gait speed, chair rise time, and the ability to do tandem stance (standing with one foot in front of the other—a measure of balance) are independent predictors of the ability to do instrumental activities of daily living (eg, shopping, traveling, cooking) and of the risk of nursing home admission and death.

Walking without assistance requires adequate attention and muscle strength plus effective motor control to coordinate sensory input and muscle contraction.

Normal Age-Related Changes in Gait

Some elements of gait normally change with aging; others do not.

Gait velocity (speed of walking) remains stable until about age 70; it then declines about 15%/decade for usual gait and 20%/decade for fast walking. Velocity is lower because elderly people take shorter steps at the same rate (cadence). The most likely reason for shortened step length (the distance from one heel strike to the next) is weakness of the calf muscles, which propel the body forward; calf muscle strength is substantially decreased in elderly people. However, elderly people seem to compensate for lower calf power by using their hip flexor and extensor muscles more than young adults.

Cadence (reported as steps/min) does not change with aging. Each person has a preferred cadence, which is related to leg length and usually represents the most energy-efficient rhythm. Tall people take longer steps at a slower cadence; short people take shorter steps at a faster cadence.

Double stance time (ie, time with both feet on the ground—a more stable position for moving the center of mass forward) increases with age. The percentage of time in double stance goes from 18% in young adults to $\geq 26\%$ in healthy elderly people. Increased time in double stance reduces the time the swing leg has to advance and shortens step length. Elderly people may increase their double stance time when they walk on uneven or slippery surfaces, when they have impaired balance, or when they are afraid of falling. They may appear as if they are walking on slippery ice.

Walking posture changes only slightly with aging. Elderly people walk upright, with no forward lean. However, elderly people walk with greater anterior (downward) pelvic rotation and increased lumbar lordosis. This posture change is usually due to a combination of weak abdominal muscles, tight hip flexor muscles, and increased abdominal fat. Elderly people also walk with their legs rotated laterally (toes out) about 5° , possibly due to a loss of hip internal rotation or in order to increase lateral stability. Foot clearance in swing is unchanged with advancing age.

Joint motion changes slightly with aging. Ankle plantar flexion is reduced during the late stage of stance (just before the back foot lifts off). The overall motion of the knee is unchanged. Hip flexion and extension are unchanged, but the hips have increased adduction. Pelvic motion is reduced in all planes.

Abnormal Changes in Gait

Causes: A number of disorders can contribute to dysfunctional or unsafe gait. They particularly include

- Neurologic disorders
- Musculoskeletal disorders (eg, spinal stenosis [see p. [384](#)], significant joint disease)

Causative neurologic disorders include dementias (see p. [1673](#)), movement and cerebellar disorders (see p. [1759](#)), and sensory or motor neuropathies (see p. [1790](#)).

Manifestations: There are many manifestations of gait abnormality. Some help suggest certain causes.

Loss of symmetry of motion and timing between left and right sides usually indicates a disorder. When healthy, the body moves symmetrically; step length, cadence, torso movement, and ankle, knee, hip, and pelvis motion are equal on the right and left sides. A *regular* asymmetry occurs with unilateral neurologic or musculoskeletal disorders (eg, a limp caused by a painful ankle). Unpredictable or highly variable gait cadence, step length, or stride width indicates breakdown of motor control of gait due to a cerebellar or frontal lobe syndrome.

Difficulty initiating or maintaining gait may occur. When patients start walking, their feet may appear stuck to the floor, typically because patients do not shift their weight to one foot to allow the other foot to move forward. This problem may represent isolated gait initiation failure, Parkinson's disease, or frontal or subcortical disease. Once gait is initiated, steps should be continuous, with little variability in the timing of the steps. Freezing, stopping, or almost stopping usually suggests a cautious gait, a fear of falling, or a frontal gait disorder. Scuffing the feet is not normal (and is a risk factor for tripping).

Retropulsion is walking backwards when initiating gait or falling backwards while walking. It may occur with frontal gait disorders, parkinsonism, CNS syphilis, and progressive supranuclear palsy.

Footdrop causes toe dragging or a stepping gait (ie, exaggerated lift of the leg to avoid catching the toe). It may be secondary to anterior tibialis weakness (eg, caused by trauma to the peroneal nerve at the lateral aspect of the knee or a peroneal mononeuropathy usually associated with diabetes), spasticity of calf muscles (gastrocnemius and soleus), or lowering of the pelvis due to muscle weakness of the proximal muscles on the stance side (particularly the gluteus medius). Low foot swing (eg, due to reduced knee flexion) may resemble footdrop.

Short step length is nonspecific and may represent a fear of falling or a neurologic or musculoskeletal problem. The side with short step length is usually the healthy side, and the short step is usually due to a problem during the stance phase of the opposite (problem) leg. For example, a patient with a weak or painful left leg spends less time in single stance on the left leg and develops less power to move the body forward, resulting in shorter swing time for the right leg and a shorter right step. The normal right leg has a normal single stance duration, resulting in a normal swing time for the abnormal left leg and a longer step length for the left leg than for the right leg.

Wide-based gait (increased step width) is determined by observing the patient's gait on a floor with 12-in (30-cm) tiles. The gait is considered wide based if the outside of the patient's feet do not stay within the width of the tile. As gait speed decreases, step width increases slightly. Wide-based gait can be caused by cerebellar disease or bilateral knee or hip disease. Variable step width (lurching to one side or the other) suggests poor motor control, which may be due to frontal or sub-cortical gait disorders.

Circumduction (moving the foot in an arc rather than a straight line when stepping forward) occurs in patients with pelvic muscle weakness or difficulty bending the knee.

Forward lean can occur with kyphosis and with Parkinson's disease or disorders with parkinsonian features associated with dementia (particularly vascular dementia and Lewy body dementia).

Festination is a progressive quickening of steps (usually with forward lean), whereby patients may break into a run to prevent falling forward. Festination can occur with Parkinson's disease and rarely as an adverse effect of dopamine-blocking drugs (typical and atypical antipsychotics).

Sideward trunk lean that is consistent or predictable to the side of the stance leg may be a strategy to reduce joint pain due to hip arthritis or, less commonly, knee arthritis (antalgic gait). In a hemiparetic gait, the trunk may lean to the strong side. In this pattern, the patient leans to lift the pelvis on the opposite side to permit the limb with spasticity (inability to flex the knee) to clear the floor during the swing phase.

Irregular and unpredictable trunk instability can be caused by cerebellar, subcortical, or basal ganglia dysfunction.

Deviations from path are strong indicators of motor control deficits.

Arm swing may be reduced or absent in Parkinson's disease and vascular dementias. Arm swing disorders may also be adverse effects of dopamine-blocking drugs (typical and atypical antipsychotics).

Evaluation

The goal is to determine as many potential contributing factors to gait disorders as possible. A performance-oriented mobility assessment tool may be helpful (see [Table 312-1](#)), as may other clinical tests (eg, a screening cognitive examination for patients with gait problems possibly due to frontal lobe syndromes).

Evaluation is best approached in 4 parts:

- Discussing the patient's complaints, fears, and goals related to mobility
- Observing gait with and without an assistive device (if safe)
- Assessing all components of gait (see [Table 312-1](#))
- Observing gait again with a knowledge of the patient's gait components

History: In addition to the standard medical history, elderly patients should be asked about gait-related issues. First, they are asked

[[Table 312-1](#). Performance-Oriented Assessment of Mobility]

open-ended questions regarding any difficulty with walking, balance, or both, including whether they have fallen (or fear they might fall). Then specific capabilities are assessed; they include whether patients can go up and down stairs; get in and out of a chair, shower, or tub; and walk as needed to buy and prepare food and do household chores. If they report any difficulties, details of the onset, duration, and progression are sought. History of neurologic and musculoskeletal symptoms and known disorders is important.

Physical examination: A thorough physical examination is done with emphasis on the musculoskeletal examination (see p. [284](#)) and the neurologic examination (see p. [1587](#)).

Lower-extremity strength is assessed. Proximal muscle strength is tested by having patients get out of a chair without using their arms. Calf strength is measured by having patients face a wall, put their palms on the wall, and rise onto their toes first using both feet and then using one foot at a time. Strength of hip internal rotation is assessed.

Gait assessment: Routine gait assessment can be done by a primary care practitioner; an expert may be needed for complex gait disorders. Assessment requires a straight hallway without distractions or obstructions and a stopwatch. A measuring tape and a T square or ruler with a right angle may be needed to accurately measure stride length.

Patients should be prepared for the examination. They should be asked to wear pants or shorts that reveal the knees and be informed that several observations may be needed but that they will be allowed to rest if fatigued.

Assistive devices provide stability but also affect gait. Use of walkers often results in a flexed posture and discontinuous gait, particularly if the walker has no wheels. If safe to do so, the practitioner should have the patient walk without an assistive device, while remaining close to or walking with the patient with a gait belt for safety. If patients use a cane, the practitioner can walk with them on the cane side or take their arm and walk with them. Patients with a suspected peripheral neuropathy should walk touching the practitioner's forearm. If gait improves with this intervention, proprioception from the arm is being used to

supplement the missing proprioception from the leg; such patients usually benefit from using a cane, which transmits information about the type of surface or floor to the cane-holding hand.

Balance is assessed by measuring the time patients can stand on one foot or on both feet in tandem stance (heel to toe); normal is ≥ 5 sec.

Gait velocity is measured using a stopwatch. Patients are timed while walking a fixed distance (preferably 6 or 8 m) at their preferred speed. The test may need to be repeated with patients walking as quickly as possible. Normal gait speed in healthy elderly people ranges from 1.1 to 1.5 m/sec.

Cadence is measured as steps/min. Cadence varies with leg length—about 90 steps/min for tall adults (1.83 m [72 in]) to about 125 steps/min for short adults (1.5 m [60 in]).

Step length can be determined by measuring the distance covered in 10 steps and dividing that number by 10. Because shorter people take shorter steps and foot size is directly related to height, normal step length is 3 foot lengths, and abnormal step length is < 2 foot lengths. A rule of thumb is that if at least 1 foot length is visible between the patient's steps, step length is normal.

Step height can be assessed by observing the swing foot; if it touches the floor, particularly in the middle of the swing phase, patients may trip. Some patients with fear of falling or a cautious gait syndrome purposefully slide their feet over the floor surface. This gait pattern may be safe on a smooth surface but is a risky strategy when walking on rugs, because patients may trip.

Asymmetry or variability of gait rhythm can be detected when practitioners whisper "dum...dum...dum" to themselves with each of the patient's steps. Some practitioners have a better ear than an eye for gait rhythm.

Testing: Testing is sometimes required.

CT or MRI of the brain is often done, particularly when there is poor gait initiation, chaotic cadence, or the appearance of a very stiff gait. These tests help identify lacunar infarcts, white matter disease, and focal atrophy and can help determine whether normal-pressure hydrocephalus should be considered.

Treatment

- Strength training
- Balance training
- Assistive devices

Although determining why gait is abnormal is important, interventions to alter gait are not always indicated. A slowed, aesthetically abnormal gait may enable the elderly person to walk safely and without assistance. However, some treatment interventions can lead to improvement; they include exercise, balance training, and assistive devices (see [Table 312-2](#)).

Strength training: Frail elderly people with mobility problems achieve modest

[[Table 312-2](#). Treatment of Gait Disorders]

improvements with exercise programs. In elderly people with arthritis, walking or resistance training reduces knee pain, and gait may improve.

Resistance exercises can improve strength and gait velocity, especially in frail patients with slowed gait. Two or three training sessions a week are usually needed; resistance exercises consist of 3 sets of 8 to 14 repetitions during each session. The load is increased every week or two until a plateau of strength is reached.

Leg press machines train all the large muscle groups of the leg and provide back and pelvic support during lifting. However, these machines are not always accessible to elderly patients. Chair rises with weight vests or weights attached to the waist (waist belts) are an alternative. Instructions are required to reduce the risk of back injury due to excess lumbar lordosis. Step-ups and stair climbing with the same weights are also useful. Ankle plantar flexion can be done with the same weights.

Using knee extension machines or attaching weights to the ankle strengthens the quadriceps. The usual starting weight for frail people is 3 kg (7 lb). Resistance for all exercises should be increased every week until the patient reaches a plateau of strength.

Balance training: Many patients with balance deficits benefit from balance training. Good standing posture and static balance are taught first. Patients are then taught to be aware of the location of pressure on their feet and how the location of pressure moves with slow leaning or turning the torso to look to the left or right. Leaning forward (using a wall or counter for support), backward (with a wall directly behind), and to each side is then practiced. The goal is for the patient to be able stand on one leg for 10 sec.

Dynamic balance training can involve slow movements in single stance, simple tai chi movements, tandem walking, turns while walking, walking backwards, walking over a virtual object (eg, a 15-cm stripe on the floor), slow forward lunges, and slow dance movements. Multicomponent balance training is probably most effective in improving balance.

Assistive devices: Assistive devices can help maintain mobility and quality of life (see p. [3457](#)). New motor strategies must be learned. Physical therapists should be involved in choice of and training with assistive devices.

Canes are particularly helpful for patients with pain caused by knee or hip arthritis or with peripheral neuropathy of the feet because a cane transmits information about the type of surface or floor to the cane-holding hand. Quad canes can stabilize the patient but usually slow gait. Canes are usually used on the side opposite the painful or weak leg. Many store-bought canes are too long but can be adjusted to the correct height (see [Fig. 350-2](#) on p. [3459](#)) by cutting (a wooden cane) or moving the pin settings (an adjustable cane). For maximal support, cane length should be such that patients have their elbow flexed 20 to 30° when holding the cane.

Walkers can reduce the force and pain at arthritic joints more than a cane, assuming adequate arm and shoulder strength. Walkers provide good lateral stability and moderate protection from forward falls but do little or nothing to help prevent backward falls for patients with balance problems. When prescribing a walker, the physical therapist should consider the sometimes competing needs of providing stability and maximizing efficiency (energy efficiency) of walking. Four-wheeled walkers with larger wheels and brakes maximize gait efficiency but provide less lateral stability. These walkers have the added advantage of a small seat to sit on if patients become fatigued.

Prevention

Although no large-scale prospective studies have confirmed the effect of increasing physical activity on gait and independence, prospective cohort studies provide convincing evidence that high levels of physical activity help maintain mobility, even in patients with disease.

Regular walking or a physically active lifestyle is the most important recommendation. The effects of deconditioning and of inactivity cannot be overstated. A regular walking program of 30 min/day is the best single activity for maintaining mobility; however, an active lifestyle that includes multiple shorter walking episodes is probably equivalent to a single 30-min walk. A safe walking course should be recommended. The patient should be instructed to increase gait speed and duration over several months.

Prevention also includes resistance and balance training. The effects of an active lifestyle on mood and confidence are probably as important as their effect on physiology.

Chapter 313. Falls in the Elderly

Introduction

A fall results in a person coming to rest on the ground or another lower level; sometimes a body part strikes against an object that breaks the fall. Typically, events caused by acute disorders (eg, stroke, seizure) or overwhelming environmental hazards (eg, being struck by a moving object) are not considered falls.

Annually, 30 to 40% of elderly people living in the community fall; 50% of nursing home residents fall. In the US, falls are the leading cause of accidental death and the 7th leading cause of death in people ≥ 65 ; 75% of deaths caused by falls occur in the 12.5% of the population who are ≥ 65 . In 2000, direct medical costs totaled \$0.2 billion (\$179 million) for fatal falls and \$19 billion for nonfatal fall injuries. By 2020, the costs are projected to reach \$44 billion.

Falls threaten the independence of elderly people and cause a cascade of individual and socioeconomic consequences. However, physicians are often unaware of falls in patients who do not present with an injury because a routine history and physical examination typically do not include a specific evaluation for falls. Many elderly people are reluctant to report a fall because they attribute falling to the aging process or because they fear being subsequently restricted in their activities or institutionalized.

Etiology

The best predictor of falling is a previous fall. However, falls in elderly people rarely have a single cause or risk factor. A fall is usually caused by a complex interaction among the following:

- Intrinsic factors (age-related decline in function, disorders, and adverse drug effects)
- Extrinsic factors (environmental hazards)
- Situational factors (related to the activity being done—eg, rushing to the bathroom)

Intrinsic factors: Age-related changes can impair systems involved in maintaining balance and stability (eg, while standing, walking, or sitting). Visual acuity, contrast sensitivity, depth perception, and dark adaptation decline. Changes in muscle activation patterns and ability to generate sufficient muscle power and velocity may impair the ability to maintain or recover balance in response to perturbations (eg, stepping onto an uneven surface, being bumped).

Chronic and acute disorders (see [Table 313-1](#)) and use of drugs (see [Table 313-2](#)) are major risk factors for falls. The risk of falls increases with the number of drugs taken. Psychoactive drugs are the drugs most commonly reported as increasing the risk of falls and fall-related injuries.

Extrinsic factors: Environmental factors can increase the risk of falls independently or, more importantly, by interacting with intrinsic factors. Risk is highest when the environment requires greater postural control and mobility (eg, when walking on a slippery surface) and when the environment is unfamiliar (eg, when relocated to a new home).

Situational factors: Certain activities or decisions may increase the risk of falls and

[\[Table 313-1. Some Disorders that Contribute to Risk of Falls\]](#)

[\[Table 313-2. Some Drugs that Contribute to Risk of Falls\]](#)

fall-related injuries. Examples are walking while talking or being distracted by dual-tasking or multitasking and then failing to attend to an environmental hazard (eg, a curb or step), rushing to the bathroom (especially at night when not fully awake or when lighting may be inadequate), and rushing to answer the

telephone.

Complications: Falling, particularly falling repeatedly, increases risk of injury, hospitalization, and death, particularly in elderly people who are frail and have preexisting disease comorbidities and deficits in activities of daily living. Longer-term complications can include decreased physical function, fear of falling, and institutionalization; falls reportedly contribute to 40% of nursing home admissions.

Over 50% of falls among elderly people result in an injury. Although most injuries are not serious (eg, contusions, abrasions), fall-related injuries account for about 5% of hospitalizations in patients ≥ 65 . About 5% of falls result in fractures of the humerus, wrist, or pelvis. About 2% of falls result in a hip fracture. Other serious injuries (eg, head and internal injuries, lacerations) occur in about 10% of falls. Some fall-related injuries are fatal. About 5% of elderly people with hip fractures die while hospitalized; overall mortality in the 12 mo after a hip fracture ranges from 18 to 33%.

About half of elderly people who fall cannot get up without help. Remaining on the floor for > 2 h after a fall increases risk of dehydration, pressure ulcers, rhabdomyolysis, hypothermia, and pneumonia.

Function and quality of life may deteriorate drastically after a fall; at least 50% of elderly people who were ambulatory before fracturing a hip do not recover their previous level of mobility. After falling, elderly people may fear falling again, so mobility is sometimes reduced because confidence is lost. Some people may even avoid certain activities (eg, shopping, cleaning) because of this fear. Decreased activity can increase joint stiffness and weakness, further reducing mobility.

Evaluation

- Clinical evaluation
- Performance testing
- Sometimes laboratory testing

After treatment of acute injuries, assessment aims to identify risk factors and appropriate interventions, thus decreasing the risk of future falls and fall-related injuries.

Some falls are promptly recognized because of an obvious fall-related injury or concern about a possible injury. However, because elderly people often do not report falls, they should be asked about falls at least once per year.

Patients who report a single fall should be evaluated for a balance or gait problem using the Get-Up-and-Go Test. For the test, patients are observed as they rise from a standard armchair, walk 3 m (about 10 ft) in a straight line, turn, walk back to the chair, and sit back down. Observation may detect lower-extremity weakness, imbalance while standing or sitting, or an unsteady gait.

Patients who require a more complete assessment of risk factors for falls include

- Those who have difficulty during the Get-Up-and-Go Test
- Those who report multiple falls during screening
- Those who are being evaluated after a recent fall (after acute injuries are identified and treated)

History and physical examination: When a more complete assessment of risk factors is needed, the focus is on identifying intrinsic, extrinsic, and situational factors that can be reduced by interventions targeted at them.

Patients are asked open-ended questions about the most recent fall or falls, followed by more specific questions about when and where a fall occurred and what they were doing. Witnesses are asked the same questions. Patients should be asked whether they had premonitory or associated symptoms (eg,

palpitations, shortness of breath, chest pain, vertigo, light-headedness) and whether consciousness was lost. Patients should also be asked whether any obvious extrinsic or situational factors may have been involved. The history should include questions about past and present medical problems, use of prescription and OTC drugs, and use of alcohol. Because eliminating all risk of future falls may be impossible, patients should be asked whether they were able to get back up without help after falling and whether any injuries occurred; the goal is reducing the risk of complications due to future falls.

The physical examination should be comprehensive enough to exclude obvious intrinsic causes of falls. If the fall occurred recently, temperature should be measured to determine whether fever was a factor. Heart rate and rhythm should be assessed to identify obvious bradycardia, resting tachycardia, or irregular rhythms. BP should be measured with patients supine and after patients stand for 1 and 5 min to rule out orthostatic hypotension. Auscultation can detect many types of valvular heart disorders. Visual acuity should be evaluated with patients wearing their usual corrective lenses if needed. Abnormalities in visual acuity should trigger a more detailed visual examination by an optometrist or ophthalmologist. The neck, spine, and extremities (especially the legs and feet) should be evaluated for weakness, deformities, pain, and limitation in range of motion.

A neurologic examination should be done (see p. [1587](#)); it includes testing muscle strength and tone, sensation (including proprioception), coordination (including cerebellar function), stationary balance, and gait. Basic postural control and the proprioceptive and vestibular systems are evaluated using the Romberg test (in which patients stand with feet together and eyes closed). Tests to establish high-level balance function include the one-legged stance and tandem gait. If patients can stand on one leg for 10 sec with their eyes open and have an accurate 3-m (10-ft) tandem gait, any intrinsic postural control deficit is likely to be minimal. Clinicians should evaluate positional vestibular function (eg, with the Dix-Hallpike maneuver—see [Sidebar 46-1](#) on p. [414](#)) and mental status (see p. [1587](#)).

Performance tests: The Performance-Oriented Assessment of Mobility or Get-Up-and-Go Test can identify problems with balance and stability during walking and other movements that may indicate increased risk of falls.

Laboratory tests: There is no standard diagnostic evaluation. Testing should be based on the history and examination and helps rule out various causes: a CBC for anemia, blood glucose measurement for hypoglycemia or hyperglycemia, and electrolyte measurement for dehydration. Tests such as ECG, ambulatory cardiac monitoring, and echocardiography are recommended only when a cardiac cause is suspected. Carotid massage under controlled conditions (IV access and cardiac monitoring) has been proposed to determine carotid hypersensitivity and ultimately who might respond to pacemaker treatment. Spinal x-rays and cranial CT or MRI are indicated only when the history and physical examination detect new neurologic abnormalities.

Prevention

The focus is on preventing or reducing the number of future falls and fall-related injuries and complications, while maintaining as much of the patient's function and independence as possible.

Patients who report a single fall and who do not have problems with balance or gait on the Get-Up-and-Go Test or a similar test should be given general information about reducing risk of falls. It should include how to use drugs safely and reduce environmental hazards (see [Table 313-3](#)).

Exercise: Patients who have fallen more than once or who have problems during initial balance and gait testing should be referred to physical therapy or an exercise program. Physical therapy and exercise programs can be done in the home if patients have limited mobility. Physical therapists customize exercise programs to improve balance and gait and to correct specific problems contributing to fall risk. More general exercise programs in health care or community settings can also improve balance and gait. For example, tai chi may be effective and can be done alone or in

[[Table 313-3](#). Home Assessment Checklist for Hazards that Increase Risk of Falling]

groups. The most effective exercise programs to reduce fall risk are those that are tailored to the patient's deficit, are provided by a trained professional, have a sufficient balance challenge component, and are provided over the long term (eg, ≥ 4 mo).

Assistive devices: Some patients benefit from use of an assistive device (eg, cane, walker). Canes may be adequate for those with minimal unilateral muscle or joint impairment, but walkers, especially wheeled walkers, are more appropriate for patients with increased risk of falls attributable to bilateral leg weakness or impaired coordination (wheeled walkers can be dangerous for patients who cannot control them properly). Physical therapists can help fit or size the devices and teach patients how to use them (see p. [3457](#)).

Medical management: Drugs that can increase the risk of falls should be stopped, or the dosage should be adjusted to the lowest effective dose. Patients should be evaluated for osteoporosis and, if osteoporosis is diagnosed, treated to reduce risk of fractures from any future falls. If any other specific disorder is identified as a risk factor, targeted interventions are required. For example, drugs and physical therapy may reduce risk for patients with Parkinson's disease. Vitamin D, particularly taken with Ca, can reduce fall risk, especially in those with reduced blood vitamin D levels. Pain management, physical therapy, and sometimes joint replacement surgery may reduce risk for patients with arthritis. A change to appropriate lenses (single lenses rather than bifocals or trifocals) or surgery, particularly for removal of cataracts, may help patients with visual impairment.

Environmental management: Correcting environmental hazards in the home may reduce the risk of falls (see [Table 313-3](#)). Patients should also be advised on how to reduce risk due to situational factors. For example, footwear should have flat heels, some ankle support, and firm, nonskid midsoles. Many patients with chronic limited mobility (eg, severe arthritis, paresis) benefit from combined medical, rehabilitative, and environmental strategies. Wheelchair adaptations (eg, removable foot plates to reduce tripping during transfers, antitip bars to prevent backward tipping), removable belts, and wedge seating may prevent falls in people with poor sitting balance or severe weakness when they are sitting or transferring.

Restraints may lead to more falls and other complications and thus should not be used. Surveillance by a caregiver is more effective and safer. Motion detectors may be used, but a caregiver must be present to respond to the triggered alarm.

Hip protectors (padding sewn into special undergarments) may help protect patients who have fallen and are at risk of a hip injury, but many patients are reluctant to wear protectors indefinitely. Compliant flooring (eg, firm rubber) can help dissipate the impact force, but a floor that is too compliant (eg, soft foam) may destabilize patients.

Patients should also be taught what to do if they fall and cannot get up. Useful techniques include turning from the supine position to the prone position, getting on all fours, crawling to a strong support surface, and pulling up. Having frequent contact with family members or friends, a phone that can be reached from the floor, a remote alarm, or a wearable emergency response system device can decrease the likelihood of lying on the floor for a long time after a fall.

Chapter 314. Social Issues in the Elderly

Introduction

Social issues influence an elderly person's risk and experience of illness as well as a health care practitioner's ability to deliver timely and appropriate care.

A social history helps members of the interdisciplinary team evaluate care needs and social supports. It should include questions about the following:

- Marital or companion status
- Living arrangements
- Financial status
- Work history
- Education
- Typical daily activities (eg, how meals are prepared, what activities add meaning to life, where problems may be occurring)
- Need for and availability of caregivers (to help plan care)
- Patients' own caregiving responsibilities (which may make patients reluctant to report their own symptoms lest their symptoms or any resulting interventions interfere with care-giving)

Family Caregiving

Family caregivers play a key role in delaying and possibly preventing institutionalization of chronically ill elderly patients. Although neighbors and friends may help, about 80% of home health care services (physical, emotional, social, economic) are provided by family caregivers. When the patient is mildly or moderately impaired, a spouse or adult children often provide care, but when the patient is severely disabled, a spouse (usually a wife) is more likely to be the caregiver.

The amount and type of care provided by family members depend on economic resources, family structure, quality of relationships, and other demands on the family members' time and energy. Family caregiving ranges from minimal assistance (eg, periodically checking in) to elaborate full-time care. On average, family caregiving consumes about 4 hours a day.

Although society tends to view family members as having a responsibility to care for one another, the limits of filial and spousal obligations vary among families and among individual family members. The willingness of family members to provide care may be bolstered by supportive services (eg, technical assistance in learning new skills, counseling services, family mental health services) and supplemental services (eg, personal care [assistance with grooming, feeding, and dressing], home health care, adult day care, meals programs). Supplemental services may be provided on a regular schedule or as respite care for a few hours or days.

Changes in demographics and social values have reduced the number of family members available to care for impaired elderly relatives because of the following:

- Increased life span: As a result, the population of the very old has been increasing. Thus, their children, who are potential care-givers, are likely to be old also.
- Delayed procreation: Combined with increased longevity, this delay has created a sandwich generation of caregivers who care simultaneously for their children and their parents.

- Increasing mobility of US society and the increased divorce rate: As a result, families are more likely to be geographically separated, and family ties are more likely to be weakened. Nonetheless, 80% of people ≥ 65 live within 20 min of one child.
- An increasing number of women entering the workforce: This increase reflects the increased number of single-parent households, most headed by women, and 2-income households. Previously, such women may have provided care for elderly parents, but the demands of a job may diminish or eliminate their ability to do so.
- The number of dependent and very sick elderly people is increasing.

These factors predict an increasing demand for home health care services provided by someone other than family members, friends, and neighbors.

Effects: Although caregiving can be very rewarding, it can also have negative effects. Family caregivers may experience considerable stress (called caregiver burden) and subsequent health problems, isolation, fatigue, and frustration, sometimes leading to a sense of helplessness and exhaustion (caregiver burnout) or elder abuse (see p. [3146](#)).

Caregiving may also become a financial burden. Couples in which one partner cares for the other tend to be disproportionately poor.

Caregivers can often obtain reassurance or learn helpful information or strategies for caregiving from physicians, nurses, social workers, or case managers. Caregivers can also take the following measures to prepare themselves for caregiving and to avoid care-giver burnout:

- Not taking the patient's anger, frustration, or difficult behavior personally
- Attending to their own physical, emotional, recreational, and financial needs
- When appropriate, asking for help with care-giving or psychologic support from other family members and friends
- Investigating outside groups that can offer psychologic support (eg, support groups) or help with caregiving (eg, counseling, home health care, adult day care, meals programs, respite care)

Living Alone

In the US, about one third of the nearly 30 million community-dwelling elderly live alone. About half of the community-dwelling oldest old (≥ 85 yr) live alone. About four fifths of elderly people living alone are women. Men are more likely to die before their wives, and widowed or divorced men are more likely to remarry than are widowed or divorced women.

The elderly who live alone are more likely to be poor, especially with advancing age. Many report feelings of loneliness (in 60% of those > 75) and social isolation. In those with health problems or sensory deficits, new or worsening symptoms may be unnoticed. Many have difficulty complying with prescribed treatment regimens. Because they have physical limitations and because eating is a social activity, some elderly people who live alone do not prepare full, balanced meals, making undernutrition a concern.

Despite these problems, almost 90% of elderly people living alone express a keen desire to maintain their independence. Many fear being too dependent on others and, despite the loneliness, want to continue to live alone. To help them maintain their independence, physicians should encourage them to engage in regular physical activity and social interactions, and social workers should help them do so.

Coordination and delivery of services during convalescence are difficult for patients living alone. Physicians should ensure that home care is available and recommend additional services as appropriate. A passive or individually activated emergency response device may reassure patients that help can be obtained if needed.

Self-Neglect

Self-neglect implies not caring for self. It can include ignoring personal hygiene, not paying bills, not obtaining or preparing food (leading to undernutrition), not seeking medical care for potentially serious symptoms, not filling prescriptions or taking drugs, and skipping follow-up visits.

Risk factors for self-neglect include social isolation, disorders that impair memory or judgment (eg, dementia), the presence of several chronic disorders, and severe depression. Differentiating between self-neglect and simply choosing to live in a way that others find undesirable can be difficult. Social workers are often in the best position to make this determination.

Adult Protective Services or the state unit on aging (whose numbers are available through the Eldercare Locator at 800-677-1116) can help by coordinating in-home safety assessments and helping the elderly obtain counseling services, emergency response systems, referrals to additional support services, and, if necessary, hospitalization.

Alternative Living Arrangements

Living arrangements and relationships that do not involve living with a spouse, with an adult child, or alone are fairly common among the elderly. For example, a substantial proportion of elderly people who never married, are divorced, or are widowed have longstanding and close relationships with siblings, friends, and partners. Understanding the nature of these relationships helps practitioners plan care that is in keeping with a patient's wishes.

About 6 to 10% of the US population are estimated to be homosexual adults, including as many as 3 million of the elderly. Elderly people in a homosexual relationship face special challenges. The health care system may not be aware of their sexual preference, may not recognize their partner as having a role in caregiving decisions or as being part of the patient's family, and may not provide services that are appropriate for their circumstances. For example, a partner may not have legal standing in decision making for a cognitively impaired patient and may not be able to share a room in a nursing home or other congregate living setting. Health care practitioners should ask questions about partners and living arrangements and try to accommodate patient preferences.

Effects of Life Transitions

Late life is commonly a period of transitions (eg, retirement, relocation) and adjustment to losses.

Retirement is often the first major transition faced by the elderly. Its effects on physical and mental health differ from person to person, depending on attitude toward and reason for retiring. About one third of retirees have difficulty adjusting to certain aspects of retirement, such as reduced income and altered social role and entitlements. Some people choose to retire, having looked forward to quitting unpleasant work; others are forced to retire (eg, because of health problems or job loss). Appropriate preparation for retirement and counseling for retirees and families who experience difficulties may help.

Relocation may occur several times during old age—eg, to smaller quarters after selling the family home, to retirement housing to reduce the burden of upkeep, or to a nursing home. Some experts contend that such moves cause relocation trauma; however, recent studies find little or no evidence of increased mortality or other indications of trauma, especially among people prepared for the move. Physical and mental status are significant predictors of relocation adjustment, as is thoughtful and adequate preparation. People who respond poorly to relocation are more likely to be living alone, socially isolated, poor, and depressed. Men respond less well than women.

The less control people perceive they have over the move and the less predictable the new environment seems, the greater the stress of relocation. People should become acquainted with the new setting well in advance. For the cognitively impaired, a move away from familiar surroundings may exacerbate functional dependence and disruptive behavior.

Bereavement affects many aspects of an elderly person's life. For example, social interaction and companionship decrease, and social status may change. The death of a spouse affects men and women differently. In the 2 yr after death of a wife, the mortality rate in men tends to increase, especially if the wife's death was unexpected. For women who lose a husband, data are less clear but generally do not indicate an increased mortality rate.

With bereavement, some sleep disturbance and anxiety are normal; these effects usually resolve in months without drug treatment. In contrast, prolonged, pathologic grief is characterized by the following:

- Symptoms that are typical of a major depressive episode and that last > 2 mo
- Feelings of guilt about things not directly related to the loss
- Thoughts of death unrelated to survivorship
- Morbid preoccupation with worthlessness
- Hallucinations other than hearing and seeing the decedent

Caregivers and health care practitioners should look for such symptoms and be aware that bereaved patients are at high risk of suicide and declining health status.

Counseling and supportive services (eg, support groups for widows) may facilitate difficult transitions. Short-term use of anxiolytic drugs can help patients with excessive anxiety. However, excessive or prolonged use should be avoided because it may interfere with the process of grieving and adjustment. Prolonged, pathologic grief usually requires psychiatric evaluation and treatment.

Intimacy

Intimacy refers to a close feeling shared between 2 people, based on knowledge of and familiarity with the other person. It includes emotional, social (based on shared experiences), and physical intimacy (eg, touching, cuddling, sexual intercourse).

The desire for intimacy does not decrease with age, and there is no age at which intimacy, including physical intimacy, is inappropriate. However, the disorders and emotional changes that often occur with aging can interfere with developing and maintaining an intimate relationship. Aging can also change the way intimacy is expressed.

Intimacy, particularly physical intimacy, may be lost because of the following:

- **Loss of a partner:** Loss or absence of a partner is probably the most common age-related barrier to intimacy.
- **Disorders:** Various disorders that become more common with aging can interfere with physical intimacy. Vascular disorders and diabetes can cause erectile dysfunction; arthritis can limit movements and make them painful. The pain, discomfort, drugs, and worry associated with a disorder can dampen the desire for intimacy. For the partner, the stress and demands of care-giving may interfere with intimacy.
- **Use of drugs:** The elderly are more likely to take drugs (eg, antihypertensives, psychoactive drugs) that can cause problems affecting intimacy (eg, erectile dysfunction, reduced libido).
- **Age-related changes:** Levels of sex hormones decrease, causing changes (eg, vaginal atrophy, reduced vaginal lubrication) that make sexual intercourse uncomfortable or difficult. Libido may decrease.
- **Reluctance to discuss effects of aging:** If elderly people develop problems that interfere with physical intimacy or if they feel embarrassed about changes in their body (eg, wrinkles, sagging flesh), they may not want to discuss these changes with their partner or with a health care practitioner, who

may be able to suggest solutions.

- **Negative stereotypes about sexuality in the elderly:** Even healthy elderly people may have internalized negative stereotypes and think sexuality is inappropriate or abnormal after a certain age.
- **Discrepancy in expectations of partners:** One partner may want certain physical expressions of intimacy, but the other does not.
- **Lack of privacy:** Elderly people who live with family members or in a long-term care facility have fewer opportunities for privacy, which are necessary for physical intimacy.
- **Shift to other forms of intimacy:** Passions may mellow after years of living together. Sexual intercourse may become less frequent or stop. Many couples—most without paying much attention to it—grow comfortable with other forms of intimacy (eg, touching, massaging, kissing, verbal expressions of affection) that express familiarity, caring, or engagement with their partner.

Nonetheless, many elderly people continue to have a healthy sexual relationship. Intimacy, particularly physical intimacy, can help prevent depression and improve self-esteem and physical health. If elderly people have a new sex partner, they should practice safe sex. Acquiring sexually transmitted diseases, including AIDS, is a risk, regardless of age.

Many elderly people, especially those that live alone, find satisfaction and a sense of companionship in interactions with a pet. Caring for a pet can give people a sense of purpose and connectedness.

Religion and Spirituality

Religion and spirituality are similar but not identical concepts. Religion is often viewed as more institutionally based, more structured, and more traditional and may be associated with organized, well-established beliefs. Spirituality refers to the intangible and immaterial and thus may be considered a more general term, not associated with a particular group or organization. It can refer to feelings, thoughts, experiences, and behaviors related to the soul or to a search for the sacred (eg, a Divine Being, Ultimate Reality, Ultimate Truth).

Traditional religion involves accountability and responsibility; spirituality has fewer requirements. People may reject traditional religion but consider themselves spiritual. In the US, > 90% of elderly people consider themselves religious and spiritual; about 5% consider themselves spiritual but not religious. Most research assesses religion, not spirituality, using measures such as attendance at religious services, frequency of private religious practices, use of religious coping mechanisms (eg, praying, trusting in God, turning problems over to God, receiving support from the clergy), and intrinsic religiosity (internalized religious commitment).

For most of the elderly in the US, religion has a major role in their life:

- 96% believe in God or a universal spirit
- > 90% pray
- > 50% attend religious services weekly or more often

The elderly's level of religious participation is greater than that in any other age group. For the elderly, the religious community is the largest source of social support outside of the family, and involvement in religious organizations is the most common type of voluntary social activity—more common than all other forms of voluntary social activity combined.

Benefits

Religion correlates with improved physical and mental health. However, experts cannot determine whether religion contributes to health or whether psychologically or physically healthier people are

attracted to religious groups. If religion is helpful, the reason—whether it is the religious beliefs themselves or other factors—is not clear. Many such factors (eg, psychologic benefits, encouragement of healthful practices, social support) have been proposed.

Psychologic benefits: Religion may provide the following psychologic benefits:

- A positive and hopeful attitude about life and illness, which predicts improved health outcomes and lower mortality rates
- A sense of meaning and purpose in life, which affects health behaviors and social and family relationships
- A greater ability to cope with illness and disability

Many elderly people report that religion is the most important factor enabling them to cope with physical health problems and life stresses (eg, declining financial resources, loss of a spouse or partner). In one study, > 90% of elderly patients relied on religion, at least to a moderate degree, when coping with health problems and difficult social circumstances. For example, having a hopeful, positive attitude about the future helps people with physical problems remain motivated to recover.

People who use religious coping mechanisms are less likely to develop depression and anxiety than those who do not; this inverse association is strongest among people with greater physical disability. Even the perception of disability appears to be altered by the degree of religiousness. Of elderly women with hip fractures, the most religious had the lowest rates of depression and were able to walk significantly further when discharged from the hospital than those who were less religious. Religious people also tend to recover from depression more quickly.

In the elderly, active involvement in a religious community correlates with better maintained physical functioning and health. Elderly people who attend religious services are more likely to stop smoking, exercise more, increase social contacts, stay married, and live longer. In one study, the mortality rate of patients with low levels of comfort from religion and of social support was 14 times that of patients with higher levels of both. Also, better mental health may improve physical health because depression and anxiety may aggravate coronary artery disease, hypertension, stroke, and psychosomatic disorders. Levels of IL-6 are significantly lower among people who attend religious services regularly than among those who do not.

Health-promoting practices: Some religious groups (eg, Mormons, Seventh-Day Adventists) advocate behaviors that enhance health, such as avoidance of tobacco and heavy alcohol use. Members of these groups are less likely to develop substance-related disorders, and they live longer than the general population.

Social benefits: Religious beliefs and practices often foster the development of community and broad social support networks. Increased social contact for the elderly increases the likelihood that disease will be detected early and that elderly people will comply with treatment regimens because members of their community interact with them and ask them questions about their health and medical care. Elderly people who have such community networks are less likely to neglect themselves.

Caregivers: Religious faith also benefits caregivers. In a study of caregivers of patients with Alzheimer's disease or terminal cancer, caregivers with a strong personal religious faith and many social contacts were better able to cope with the stresses of caregiving during a 2-yr period.

Harmful Effects

Religion is not always beneficial to the elderly. Religious devotion may promote excessive guilt, narrow-mindedness, inflexibility, and anxiety. Religious preoccupations and delusions may develop in patients with obsessive-compulsive disorder, bipolar disorder, schizophrenia, or psychoses.

Certain religious groups discourage necessary mental and physical health care, including lifesaving

therapies (eg, blood transfusions, treatment of life-threatening infections, insulin therapy), and may substitute religious rituals (eg, praying, chanting, lighting candles). Religious cults may isolate and alienate elderly people from family members and the broader social community; some cults sometimes encourage self-destruction.

Role of the Health Care Practitioner

Talking to elderly patients about their religious beliefs and practices helps health care practitioners provide care because these beliefs can affect the patients' mental and physical health. Inquiring about religious issues during a medical visit is appropriate under certain circumstances, including the following:

- When patients are severely ill, under substantial stress, or near death and ask or suggest that a practitioner talk about religious issues
- When patients tell a practitioner that they are religious and that religion helps them cope with illness
- When religious needs are evident and may be affecting patients' health or health behaviors

The elderly often have distinct spiritual needs that may overlap with but are not the same as psychologic needs. Ascertaining a patient's spiritual needs can help mobilize the necessary resources (eg, spiritual counseling or support groups, participation in religious activities, social contacts from members of a religious community).

Spiritual history: Taking a spiritual history shows elderly patients that the health care practitioner is willing to discuss spiritual topics. Practitioners may ask patients whether their spiritual beliefs are an important part of their life, how these beliefs influence the way they take care of themselves, whether they are a part of a religious or spiritual community, and how they would like the health care practitioner to handle their spiritual needs.

Alternatively, a practitioner may ask patients to describe their most important coping mechanism. If the response is not a religious one, patients may be asked whether religious or spiritual resources are of any help. If the response is no, patients may be sensitively asked about barriers to those activities (eg, transportation problems, hearing difficulties, lack of financial resources, depression, lack of motivation, unresolved conflicts) to determine whether the reason is circumstances or their choice. However, practitioners should not force religious beliefs or opinions on patients or intrude if patients do not want help.

Referral to clergy: Many clergy members provide counseling services to the elderly at home and in the hospital, often free of charge. Many elderly patients prefer such counseling to that from a mental health care practitioner because they are more satisfied with the results and because they believe such counseling does not have the stigma that mental health care does. However, many clergy members do not have extensive training in mental health counseling and may not recognize when elderly patients need professional mental health care. In contrast, many hospital clergy have extensive training in the mental, social, and spiritual needs of the elderly. Thus, including hospital clergy as part of the health care team can be helpful. They can often bridge the gap between hospital care and care in the community by communicating with clergy in the community. For example, when a patient is discharged from the hospital, the hospital clergy may call the patient's clergy, so that support teams in the patient's religious community can be mobilized to help during the patient's convalescence (eg, by providing housekeeping services, meals, or transportation, by visiting the patient or caregiver).

Support of patients' religious beliefs and practices: Health care practitioners should support the patient's religious involvement as long as it does not interfere with necessary medical care because such involvement may contribute to good health. People who are actively involved in religious groups, particularly those in major religious traditions, tend to be healthier.

Religious interventions: Some practitioners pray with patients, read religious scriptures to them, or make sure patients have the religious materials (eg, large-print scriptures, religious audiotapes) they want. However, practitioners should not feel obligated to do anything that violates their own beliefs.

Recommendation of religious activities: Health care practitioners may suggest that patients consider religious activities if patients seem receptive and may benefit from such activities, which can provide social contact, reduce alienation and isolation, and increase a sense of belonging, of meaning, and of life purpose. These activities may also help the elderly focus on positive activities rather than on their own problems. However, some activities are appropriate only for more religious patients. If patients are not already involved in religious activities, suggesting such activities requires sensitivity. Patients seek medical care for health-related reasons, not religious ones.

Patient and family information: Health care practitioners can provide information about the health benefits of religious beliefs and practices for the elderly and about local religious resources (eg, support groups at local churches, health promotion programs, volunteer activity programs).

Elder Abuse

Elder abuse is physical or psychologic mistreatment, neglect, or financial exploitation of the elderly.

Common types of elder abuse include physical abuse, psychologic abuse, neglect, and financial abuse. Each type may be intentional or unintentional. The perpetrators are usually a spouse or adult children but may be other family members or paid or informal caregivers. Abuse usually becomes more frequent and severe over time.

Physical abuse is use of force resulting in physical or psychologic injury or discomfort. It includes striking, shoving, shaking, beating, restraining, and forceful or improper feeding. It may include sexual assault (any form of sexual intimacy without consent or by force or threat of force).

Psychologic abuse is use of words, acts, or other means to cause emotional stress or anguish. It includes issuing threats (eg, of institutionalization), insults, and harsh commands, as well as remaining silent and ignoring the person. It also includes infantilization (a patronizing form of ageism in which the perpetrator treats the elderly person as a child), which encourages the elderly person to become dependent on the perpetrator.

Neglect is the failure to provide food, medicine, personal care, or other necessities. Neglect that results in physical or psychologic harm is considered abuse.

Financial abuse is exploitation of or inattention to a person's possessions or funds. It includes swindling, pressuring a person to distribute assets, and managing a person's money irresponsibly.

Although the true incidence is unclear, elder abuse appears to be a growing public health problem in the US. In a large US urban study of people ≥ 65 , 3.2% were victims of physical abuse, psychologic abuse, or neglect. Because certain forms of abuse (eg, financial exploitation) were not included, the actual incidence of mistreatment was probably higher. In Canadian and western European studies, incidence of abuse was comparable to that in the US.

Risk Factors

For the victim, risk factors for abuse include impairment (chronic disorders, functional impairment, cognitive impairment) and social isolation. For the perpetrator, risk factors include substance abuse, psychiatric disorders, a history of violence, stress, and dependence on the victim (including shared living arrangements—see [Table 314-1](#)).

Diagnosis

Abuse is difficult to detect because many of the signs are subtle and the victim is often unwilling or unable to discuss the abuse. Victims may hide abuse because of shame, fear of retaliation, or a desire to protect the perpetrator. Sometimes when abuse victims seek help, they encounter ageist responses from health

care practitioners, who may, for example, dismiss complaints of abuse as confusion, paranoia, or dementia.

Social isolation of the elderly victim often makes detection difficult. Abuse tends to increase the isolation because the perpetrator often limits the victim's access to the outside world (eg, denies the victim visitors and telephone calls).

[Table 314-1. Risk Factors for Elder Abuse]

Symptoms and signs of abuse may erroneously be attributed to a chronic disorder (eg, a hip fracture attributed to osteoporosis). However, certain clinical situations are particularly suggestive of abuse (see [Table 314-2](#)).

History: If abuse is suspected, the patient should be interviewed alone, at least for part of the time. Other involved people may also be interviewed separately. The patient interview may start with general questions about feelings of safety but should also include direct questions about possible mistreatment (eg, physical violence, restraints, neglect). If abuse is confirmed, the nature, frequency, and severity of events should be elicited. The circumstances precipitating the abuse (eg, alcohol intoxication) should also be sought.

Social and financial resources of the patient should be assessed because they affect management decisions (eg, living arrangements, hiring of a professional caregiver). The examiner should inquire whether the patient has family members or friends able and willing to nurture, listen, and assist. If financial resources are adequate but basic needs are not being met, the examiner should determine why. Assessing these resources can also help identify risk factors for abuse (eg, financial stress, financial exploitation of the patient).

In the interview with the family caregiver, confrontation should be avoided. The interviewer should explore whether caregiving responsibilities are burdensome for the family member and, if appropriate, acknowledge the caregiver's difficult role. The caregiver is asked about recent stressful events (eg, bereavement, financial stresses), the patient's illness (eg, care needs, prognosis), and the reported cause of any recent injuries.

Physical examination: The patient should be thoroughly examined, preferably at the first visit, for signs of abuse (see [Table 314-3](#)). The physician may need help from a trusted family member or friend of the patient, state adult protective services, or, occasionally, law enforcement agencies to persuade the care-giver or patient to permit the evaluation. If abuse is identified, a referral to Adult Protective Services is mandatory in most states.

Cognitive status should be assessed, eg, using the Mini-Mental State Examination. Cognitive impairment is a risk factor for elder abuse and may affect the reliability of the history and the patient's ability to make management decisions.

Mood and emotional status should be assessed. If the patient feels depressed, ashamed, guilty, anxious, fearful, or angry, the beliefs underlying the emotion should be explored. If the patient minimizes or rationalizes family tension or conflict or is reluctant to discuss abuse, the examiner should determine whether these attitudes are interfering with recognition or admission of abuse.

[Table 314-2. Clinical Situations Suggesting Elder Abuse]

Functional status, including the ability to do activities of daily living (ADLs), should be assessed and any physical limitations that impair self-protection noted. If help with ADLs is needed, the examiner should determine whether the current caregiver has sufficient emotional, financial, and intellectual ability for the task. Otherwise, a new caregiver needs to be identified.

Coexisting disorders caused or exacerbated by the abuse should be sought.

Laboratory tests: Imaging and laboratory tests (eg, electrolytes to determine hydration, albumin to determine nutritional status, drug levels to document compliance with prescribed regimens) are done as necessary to identify and document the abuse.

Documentation: The medical record should contain a complete report of the actual or suspected abuse, preferably in the patient's own words. A detailed description of any injuries should be included, supported by photographs, drawings, x-rays, and other objective documentation (eg, laboratory test results) when possible. Specific examples of how needs are not being met, despite an agreed-on care plan and adequate resources, should be documented.

Prognosis

Abused elderly people are at high risk of death. In a large 13-yr longitudinal study, the

[[Table 314-3](#). Signs of Elder Abuse]

survival rate was 9% for abuse victims compared with 40% for nonabused controls. Multivariate analysis to determine the independent effect of abuse indicated that risk of mortality for abused patients over a 3-yr period after abuse was 3 times higher than that for controls over a similar period.

Treatment

An interdisciplinary team approach (involving physicians, nurses, social workers, lawyers, law enforcement officials, psychiatrists, and other practitioners) is essential. Any previous intervention (eg, court orders of protection) and the reason for its failure should be investigated to avoid repeating any mistakes.

Intervention: If the patient is in immediate danger, the physician, in consultation with the patient, should consider hospital admission, law enforcement intervention, or relocation to a safe home. The patient should be informed of the risks and consequences of each option.

If the patient is not in immediate danger, steps to reduce risk should be taken but are less urgent. The choice of intervention depends on the perpetrator's intent to harm. For example, if a family member administers too much of a drug because the physician's directions are misunderstood, the only intervention needed may be to give clearer instructions. A deliberate overdose requires more intensive intervention.

In general, interventions need to be tailored to each situation. Interventions may include

- Medical assistance
- Education (eg, teaching victims about abuse and available options, helping them devise safety plans)
- Psychologic support (eg, psychotherapy, support groups)
- Law enforcement and legal intervention (eg, arrest of the perpetrator, orders of protection, legal advocacy including asset protection)
- Alternative housing (eg, sheltered senior housing, nursing home placement)
- Counseling the victim, which usually requires many sessions (progress may be slow)

If victims have decision-making capacity, they should help determine their own intervention. If they do not, the interdisciplinary team, ideally with a guardian or objective conservator, should make most decisions. Decisions are based on the severity of the violence, the victim's previous lifestyle choices, and legal ramifications. Often, there is no single correct decision; each case must be carefully monitored.

Nursing and social work issues: As members of the interdisciplinary team, nurses and social workers

can help prevent elder abuse and monitor the results of interventions. A nurse, social worker, or both can be appointed as coordinator to ensure that pertinent information is accurately recorded, that relevant parties are contacted and kept informed, and that necessary care is available 24 h/day.

In-service education about elder abuse should be offered to all nurses and social workers annually. In some states (eg, New York), education about child abuse (but not yet about elder abuse) is mandatory for physician, nursing, and social work licensure.

Reporting: All states require that suspected or confirmed abuse in an institution be reported, and most states require that abuse in the home also be reported. All US states have laws protecting and providing services for vulnerable, incapacitated, or disabled adults.

In > 75% of US states, the agency designated to receive abuse reports is the state social service department (Adult Protective Services). In the remaining states, the designated agency is the state unit on aging. For abuse within an institution, the local long-term care ombudsman office should be contacted. Telephone numbers for these agencies and offices in any part of the US can be found by calling the Eldercare Locator (800-677-1116) or the National Center on Elder Abuse (202-682-2470) and giving the patient's county and city of residence or zip code. Health care practitioners should know reporting laws and procedures for their own states.

Caregiver issues: Caregivers of a physically or cognitively impaired elderly person may not be able to provide adequate care or may not realize that their behavior sometimes borders on abuse. These caregivers may be so immersed in their caregiving roles that they become socially isolated and lack an objective frame of reference for what constitutes normal caregiving. The deleterious effects of caregiver burden, including depression, an increase in stress-related disorders, and a shrinking social network, are well documented (see p. [3141](#)). Physicians need to point out these effects to caregivers. Services to help caregivers include adult day care, respite programs, and home health care.

Prevention

A physician or other health care practitioner may be the only person an abuse victim has contact with other than the perpetrator and should therefore be vigilant for risk factors and signs of abuse. Recognizing high-risk situations can prevent elder abuse—eg, when a frail or cognitively impaired elderly person is being cared for by someone with a history of substance abuse, violence, a psychiatric disorder, or caregiver burden. Physicians should pay particular attention when a frail elderly person (eg, a person with a recent history of stroke or a newly diagnosed condition) is discharged into a precarious home environment. Physicians should also remember that perpetrators and victims may not fit stereotypes.

Elderly people often agree to share their homes with family members who have drug or alcohol problems or serious psychiatric disorders. A family member may have been discharged from a mental or other institution to an elderly person's home without having been screened for risk of causing abuse. Physicians should therefore counsel elderly patients considering such living arrangements, especially if the relationship was fraught with tension in the past.

Patients can also actively decrease their risk of abuse (eg, by maintaining social relationships, by increasing social and community contacts). They should seek legal advice before signing any documents related to where they live or who makes financial decisions for them.

Chapter 315. The Older Driver

Introduction

Driving is essential for most older adults to maintain their autonomy. In the US, about 20 million drivers are ≥ 65 . This number is expected to more than double by 2020.

Safe driving requires the integration of complex visual, physical, and cognitive tasks, and older drivers may have mild to moderate deficits in these domains. Many older drivers successfully self-regulate their behavior and compensate for deficits by avoiding rush hour, driving fewer miles per year, limiting trips to shorter distances, and avoiding driving during twilight, nighttime, or bad weather. Also, older drivers tend to be more cautious, drive more slowly, and take fewer risks. However, some older adults, whether because of denial, dementia, or a strong desire to maintain independence, continue to drive despite significant impairments in driving ability.

Older drivers on average have a lower annual incidence of crashes with injury (rates per 1000 licensed drivers—see

[Fig. 315-1](#)) than drivers of all other ages. However, because the number of miles driven per year also declines with aging (see

[Fig. 315-2](#)), the crash rate per mile for drivers ≥ 70 is higher than that for drivers of all other ages except those < 20 .

Most crashes involving older drivers occur during the daytime and on weekdays.

[[Fig. 315-1](#). Number of crashes per licensed driver by age (2003).]

[[Fig. 315-2](#). Annual mileage by age and sex (2001).]

These crashes often result from failure to yield the right-of-way or heed a stop sign or red light and tend to occur while going through intersections, making left turns, or merging into traffic. Crashes are more likely to involve multiple vehicles and to result in serious injuries and fatalities. Unlike in younger drivers, alcohol and speeding rarely play a role.

When crashes do occur, older adults seem to be more vulnerable to injury because

- They have less capacity to withstand trauma.
- They often have more comorbidities.
- Many crashes are driver-side impact (eg, occur while making left turns), making the driver more likely to be injured.
- They are more likely than younger drivers to drive very old cars without air bags or other improvements in crash protection.

However, as cars have become more crash-worthy and other efforts have improved traffic safety, the crash fatality rate of older adults has decreased over the past decade.

Assessment: Health care practitioners become involved in driving decisions when deficits are identified during routine examination, when family members express concern, when law enforcement cites unsafe driving behaviors, or when patients solicit advice. The role of practitioners is to do detailed functional and medical assessments related to driving safety.

Driving history should be reviewed; details of driving habits and past violations, accidents, close calls, or getting lost may point to general or specific impairments. Some impairments may obligate practitioners to refer a patient to the state Department of Motor Vehicles for additional testing or driving restrictions. (See the National Highway Traffic Safety Administration's [NHTSA] Physician's Guide to Assessing and Counseling Older Drivers for state licensing requirements and reporting regulations at

[www.nhtsa.gov/people/injury/olddrive/OlderDriversBook/.](http://www.nhtsa.gov/people/injury/olddrive/OlderDriversBook/))

Key Points

- The number of older adults is growing rapidly.
- Driving cessation is inevitable for many and can have negative outcomes (eg, social isolation, depression, fewer driving destinations).
- Age-related and disease-related changes in physical and cognitive function can impair driving ability and account for some of the increased crash rate per miles driven.
- Many older drivers successfully self-regulate their behavior.
- Older adults are more vulnerable to injury in a crash than younger adults.
- The role of practitioners is to do functional and medical assessments, which determine overall driving safety, and to communicate recommendations effectively to older drivers and their family members.
- State licensing requirements and reporting regulations that pertain to older drivers are available from the NHTSA.

Functional Assessment

Functional assessment involves assessment of a patient's visual, physical, and cognitive abilities. (See the National Highway Traffic Safety Administration web site for an Assessment of Driving-Related Skills [ADReS].) Adequate function in these areas is required to drive safely. Much of the assessment can be done by primary health care practitioners, but specialists (eg, ophthalmologists, occupational and physical therapists, driving rehabilitation specialists) may need to be consulted. Identified deficits may require interventions (see p. [3154](#)), including driving rehabilitation, assistive devices, driving cessation, and reporting to the state Department of Motor Vehicles. Some complicated cases may be referred to state medical advisory boards.

Visual function: Visual function is vital to safe driving. Age-related and pathologic changes in vision are common and can contribute to driving impairment. Changes with aging include

- Decreased retinal illuminance (amount of light reaching the retina), visual acuity, and peripheral vision
- Presbyopia (decreased ability to accommodate), which impairs depth perception
- Decreased ability to adapt to changes in light and heightened sensitivity to glare, which impair night driving

In many states, central visual acuity and peripheral vision are routinely tested by the Department of Motor Vehicles when a license is renewed. Most states require 20/40 visual acuity in at least one eye for unrestricted licensing (glasses or contacts are allowed). However, in some states, practitioners can extend the requirement pending medical justification. Additionally, some states have approved use of bioptics (a lens system with a telescope attached to a pair of glasses) for people with severely reduced vision. For horizontal peripheral vision, safe driving thresholds vary widely among states from no requirement to about 140°.

Tests of useful field of view (spatial area from which visual stimuli can be acquired during a single fixed glance) provide integrated measures of visual performance (eg, visual-processing speeds, visual-spatial attention, visual memory) and can be used to predict a higher risk of crash. For example, the incidence of crashes is 6 times higher when useful field of view is reduced by > 40%. However, field-of-view tests are not yet widely available.

Older drivers often require referral to an ophthalmologist for comprehensive testing.

Physical function: Various parameters of physical function can be assessed in the office.

- Motor speed, balance, and coordination can be assessed with the rapid-pace walk test. The patient is asked to walk a 3-m (10-ft) path, turn around, and walk back to the starting point as quickly as possible. If the patient normally walks with a walker or cane, it should be used during the test. A time of > 9 sec may indicate an increased risk of a motor vehicle crash.
- Range of motion should be tested in the cervical region and in all joints of the upper and lower extremities. Decreased cervical range of motion impairs ability to turn the head and scan for traffic (particularly in the blind spot). Decreased range of motion in the extremities impairs ability to operate car controls.
- Strength in upper and lower extremities should be assessed qualitatively (in terms of meeting the needs of driving a vehicle). Grip strength should be measured with a dynamometer. A grip strength of < 16 kg for men or < 14 kg for women may reflect decreased ability to manipulate the steering wheel.
- Proprioception and peripheral sensory function should be tested. Decreased peripheral sensation can impair ability to modulate pressure on foot controls.

Physical and occupational therapists who specialize in driving rehabilitation can provide comprehensive testing of physical function related to driving ability. A rehabilitation driving assessment sometimes also involves the specialist going out in a car with the patient to evaluate actual driving skills. The car used during the evaluation should be equipped with features that allow the specialist to maintain safe control (eg, passenger-side brake). Driving rehabilitation specialists can be located by contacting local rehabilitation facilities or going to www.driver-ed.org. However, in most states, the cost of a rehabilitation driving assessment is not covered by insurance (Medicare or private).

Cognitive function: Cognition is moderately impaired in about 3% of community-dwelling people aged 65 to 74, 14% of those aged 75 to 84, and > 20% of those > 85. People with cognitive impairment often do not recognize their limitations and are at higher risk of crashes; risk increases with severity of impairment. Tests that may predict driving performance include the following:

- The Clock Drawing Test: This test assesses long-term memory, short-term memory, visual perception, visuospatial skills, selective attention, and executive skills.
- The Trail Making Test (Part B): This easily given test assesses divided attention and visual scanning and can be found at the National Highway Traffic Safety Administration web site. Drivers with an abnormal score on this test (eg, > 180 sec) may be candidates for more specialized testing by a driving rehabilitation specialist.
- The Mini-Mental State Examination: Examination of mental status (see [Sidebar 168-1](#) on p. [1588](#)) screens for cognitive impairments.

Drivers with mild cognitive impairment should be considered for referral for more precise neuropsychologic testing.

Medical Assessment

Medical assessment involves a review of medical conditions and drugs that could impair driving ability. In general, any condition or drug that can impair consciousness should raise concern about driving safety.

Falls: Falls and motor vehicle crashes share common causative factors (eg, impaired vision, muscle strength, cognition). A history of falls in the past 1 to 2 yr indicates increased risk of crashes and should prompt further evaluation of physical functioning (see above).

Cardiac disorders: Cardiac disorders may increase driving risk. General guidelines include refraining from driving for

- 1 mo after MI, coronary artery bypass surgery, or stabilization of unstable angina symptoms
- 3 mo after arrhythmia with syncope
- 6 mo after internal cardioverter defibrillator placement or after resuscitation required because of sustained ventricular tachycardia or ventricular fibrillation

Patients with severe heart failure (eg, class IV heart failure, dyspnea at rest or while driving) should refrain from driving until they can be evaluated with on-road testing.

Neurologic disorders: Neurologic disorders also increase driving risk. Specific disorders include

- Stroke or transient ischemic attack (TIA): Drivers with a single TIA should wait 1 mo before resuming driving; those with recurrent TIAs or stroke should be event-free for at least 3 mo before resuming driving. Physical examination should be done to assess how residual disability due to stroke may affect driving ability.
- Seizures: Regulations for drivers who have seizures are state-specific, but most states require a seizure-free interval (often 6 mo) before they reinstate driving privileges. Anticonvulsants can adequately control seizures in about 70% of patients, although relapses may occur when these drugs are withdrawn.

Many other neurologic disorders (eg, Parkinson's disease) cause disability and should be monitored by functional assessment and possibly an on-road test.

Diabetes mellitus: Diabetes mellitus poses a risk because patients may become hypoglycemic while driving. Patients who have had a recent hypoglycemic episode affecting awareness should not drive for 3 mo or until factors contributing to the episode (eg, diet, activity, timing and dose of insulin or antihyperglycemic drug) have been assessed and managed. Sensory changes in the extremities due to diabetes can also impair driving ability.

Sleep disorders: Sleep disorders, most notably obstructive sleep apnea syndrome, can cause drowsiness leading to crashes, and patients should refrain from driving until they are adequately treated.

Drugs: When starting a new drug that could affect visual, physical, or cognitive function, patients should refrain from driving for 1 to 2 days to be sure no adverse effects occur. Drugs that increase driving risk include

- Antihistamines, benzodiazepines, opioids, anticholinergics, hypnotics, antihypertensives, or tricyclic antidepressants: These drugs increase driving risk because they can cause drowsiness; some can also cause hypotension or arrhythmias.
- Antiparkinsonian dopamine agonists (eg, pergolide, pramipexole, ropinirole): These drugs occasionally cause acute sleep attacks, which pose an especially high risk of crashes.
- Antiemetics (eg, prochlorperazine) and muscle relaxants (eg, cyclobenzaprine): These drugs are cause for concern because of their potential for altering sensory perception.

Instructing patients to bring all drug containers to the office can help identify drugs that increase risk.

Older adults are involved in fewer alcohol-related fatal crashes. Fewer older adults consume alcohol, but limiting alcohol consumption is still important because blood alcohol level per amount of alcohol consumed is higher in older adults. Also, concurrent use of alcohol and other drugs, particularly multiple drugs, further impairs cognition, increasing the risk of crashes.

Interventions

If older drivers with significant functional deficits decide to limit or stop driving, the role of health care

practitioners is largely supportive. If the medical evaluation identifies potentially correctable deficits and older drivers acknowledge these deficits but still wish to continue driving, practitioners can offer treatment to help correct the deficits or impairments. However, aside from treating medical conditions that impair driving ability, most practitioners are ill-equipped to formulate or execute a driving rehabilitation plan; referral to specialists is often helpful.

Driving rehabilitation programs: Although some older drivers can benefit from driving refresher courses (eg, American Association of Retired Persons Driver Safety Program available at www.aarp.org), most should be referred to occupational therapists that specialize in driving rehabilitation. Driving rehabilitation specialists can help by

- Clinically assessing skills related to driving and accompanying drivers on a road test for direct evaluation of driving skills and deficits
- Instituting a tailored rehabilitation plan to increase motor skills or cognition and perception in the driver's daily life
- Providing adaptive equipment, such as a spinner knob to help with one-handed steering or more complicated devices such as hand controls
- Evaluating the response to the rehabilitation plan and providing feedback to the drivers as well as their relatives and physician as to whether the driver's abilities are adequate to continue driving

However, in most states, the costs of a rehabilitation driving assessment and the adaptive equipment are not covered by insurance (Medicare or private).

Driving cessation: If older drivers deny or are unaware of their limitations or if deficits do not respond to treatment, practitioners may need to be more proactive. In these situations, practitioners should discuss issues relevant to driving safety, potential driving cessation, patient transportation needs, and alternative transportation resources with the patient and family members.

The practitioner should balance the benefits of safety to the patient, pedestrians, and other drivers against the costs of social isolation, worsening functional status, impaired quality of life, and clinical depression. For some patients (eg, those with severe dementia), the benefits of driving restriction clearly outweigh the costs.

Alternative transportation options should be discussed; they vary from community to community, and contact with local resources such as the Alzheimer's Association (www.alz.org) or American Automobile Association Foundation for Traffic Safety (www.seniordrivers.org) may prove beneficial. Family members can find information about having conversations with older drivers at www.thehartford.com/talkwitholderdrivers/.

The loss of driving privileges can be relatively devastating in terms of maintaining independence. If alternative transportation cannot be arranged and the ability to maintain activities of daily living is adversely affected, loss of driving privileges sometimes prompts the need to move in with a family member or transition to an assisted-living facility.

Reporting: If the driver's functional limitations or medical status seems to warrant driving cessation, practitioners should follow the reporting requirements of their state Department of Motor Vehicles. States vary in their reporting laws. All states have voluntary reporting laws, but some states have mandatory reporting laws. In most states, statutes protect the practitioner's anonymity or provide immunity to the practitioner. Legal consultation may be beneficial when an office or institution is developing a reporting policy and procedure.

Before making a report, practitioners should discuss recommendations for driving cessation directly with the patient and family rather than simply filing a report. Practitioners should make every attempt to persuade the patient to cooperate with driving restrictions. Such discussion should include why the patient's limitations make driving unsafe and why the practitioner is obligated to report.

In some situations, practitioners must report functional limitations or medical status to state agencies against the wishes of their patients; this action often has a negative impact on the practitioner-patient relationship. Regardless, medical information can be legally disclosed if a patient's driving impairment might jeopardize public safety; practitioners who do not notify appropriate authorities may be legally liable for subsequent injuries.

Chapter 316. Funding Health Care for the Elderly

Introduction

In the US, health care services for the elderly are funded mainly by Medicare, Medicaid, the Veterans Health Administration, private insurance, and out-of-pocket payments. In addition, many states offer health-related benefits and programs, such as subsidies for transportation, housing, utilities, telephone, and food expenses, as well as help at home and nutrition services. Health care workers should help elderly patients learn about health benefits and programs they are entitled to.

Medicare

Medicare, administered by the Center for Medicare and Medicaid Services (CMS), is primarily a health insurance program for the elderly. (Medicare funds are also used to support certain components of postgraduate medical training and programs that regulate and monitor quality of care.) The following groups are eligible for Medicare:

- US citizens who are ≥ 65 and are eligible for benefits under Social Security, Civil Service Retirement, or Railroad Retirement
- People of all ages with end-stage renal disease requiring dialysis or transplantation
- Some people who are < 65 and have certain disabilities

The type and range of services that Medicare covers change regularly with new statutory and regulatory amendments (current information is available at www.medicare.gov). Each state has a State Health Insurance Assistance Program, which patients can call for assistance in understanding and choosing Medicare plans, understanding bills, and dealing with payment denials or appeals.

Physicians should understand basic Medicare rules, supply documentation used to determine whether patients are eligible for benefits, and make referrals to legal and social services for counseling and support.

If a patient's claim is denied, a Medicare Summary Notice is issued to the patient to provide information about services or supplies that Medicare does not cover. The denial of coverage may be reversed by a challenge made within 120 days of the notice. The challenge must be supported by an appeal in a fair hearing administrative forum, in which the insurance company handling Medicare claims reviews the case. If unsatisfied with the outcome of that review, the patient has the right to a hearing before a judge.

The original Medicare Plan (sometimes referred to as the fee-for-service plan) has 2 parts:

- Part A (hospital insurance)
- Part B (medical insurance)

The original Medicare Plan is available nationwide. A complete description of Part A and B services and other provisions (called *Medicare & You 2010*) is available at www.medicare.gov or by calling 800-633-4227.

In 2003, the Medicare Modernization Act was enacted to provide reimbursement for health care in models other than traditional fee-for-service and to provide reimbursement for prescription drugs. The results were

- Part C (Medicare Advantage Plans), which includes managed care plans, preferred provider organization plans, and private fee-for-service plans
- Part D (for prescription drugs)

Each part covers specific health care services (see [Table 316-1](#)). Medicare does not cover intermediate or long-term nursing care (except for the Part A services noted below), nor does it cover routine eye, foot, or dental examinations.

Part A

More than 95% of people ≥ 65 are enrolled in Part A. Part A is supported by a payroll tax collected from people who are working; it represents prepaid hospital insurance for Medicare-qualified retirees. Generally, only people who receive monthly Social Security payments are eligible, and most of those who are eligible do not pay premiums. However, people may be required to pay premiums if they or their spouses have worked < 40 quarters at a job that is considered Medicare eligible (ie, if they or their employer paid the payroll tax required by the Federal Insurance Contributions Act [FICA]). Premiums in 2010 were \$254/mo for people with 7.5 to 10 yr of eligible employment and \$461/mo for those with < 7.5 yr of eligible employment. People whose income and assets are below certain thresholds are eligible for financial assistance from the Medicare Savings Programs (see p. [3162](#)).

Part A covers the following under the circumstances outlined below:

- Inpatient hospital care
- Posthospital care in a skilled nursing facility or a rehabilitation facility
- Hospice care
- Limited custodial care
- Limited home health care

Care in a hospital or a skilled nursing facility is paid for based on benefit periods. A benefit period begins when a person is admitted to a facility and ends when the person has been out of the facility for 60 consecutive days. If a person is readmitted after the 60 days, a new benefit period begins, and another deductible must be paid. If a person is readmitted in < 60 days, an additional deductible is not paid, but the hospital or facility may not receive full payment for the 2nd admission. There is no limit to the number of benefit periods.

Medicare Prospective Payment Systems determine what Medicare will pay for each aspect of care it covers (eg, for hospital inpatient care, skilled nursing facility care, or home health care).

Inpatient hospital care: Under Part A, the beneficiary pays only a deductible for the first 60 full coverage days of the benefit period; the deductible is established annually (\$1100 in 2010). If the hospital stay exceeds 60 days, the beneficiary pays a daily co-payment equal to one fourth of the deductible (in 2010, \$275 per day for days 61 to 90). If the hospital stay exceeds 90 days, the beneficiary pays a daily co-payment equal to half of the deductible (in 2010, \$550 per day for days 91 to 150). Days 91 to 150 during a hospital stay are designated as reserve days. Part A benefits include 60 lifetime reserve days for use after a 90-day benefit period has exhausted.

[\[Table 316-1. Funding Sources by Type of Care\]](#)

The 60 days are not renewable and can be used only once during a beneficiary's lifetime. Payment is automatically made for such additional days of hospital care after the 90 days of benefits have been exhausted unless the beneficiary chooses not to have such payment made (thus saving the reserve days for a later time). Beyond 150 days, the beneficiary is responsible for all charges.

Part A covers virtually all medically necessary hospital services, except it provides only limited coverage for inpatient mental health care services. Part A pays for a semiprivate room or, if medically necessary, a private room, but not for amenities. Other covered services include discharge planning and medical social services, such as identification of eligibility for public programs and referrals to community agencies.

The prospective payment system determines payment for inpatient hospital care based on the diagnosis-related group (DRG). The DRG is determined by the beneficiary's principal diagnosis with some adjustment for age, severity, sex, comorbidities, and complications. Hospitals are reimbursed a set amount for a given DRG regardless of their actual expenses in providing care. Thus, a hospital's financial profit or loss depends partly on length of stay and costs of diagnosis and therapy for each patient. Under the prospective payment system, the financial pressure for early discharge and limited intervention may conflict with medical judgment. When a patient cannot be discharged home safely or to a nursing home because no bed is available, Medicare typically pays a relatively low per diem cost for an alternative level of care.

Inpatient care in a skilled nursing facility: Coverage of skilled nursing care and skilled rehabilitation services is complex and can change every year. These services are covered only if initiated immediately or shortly after discharge from a hospital. The period of coverage is usually < 1 mo (specific duration of coverage depends on documented improvement in the patient's condition or level of function). In 2010, the first 20 days were covered completely; the next 80 days were covered but required a co-payment of \$137.50/day. Benefits are limited to 100 days per benefit period.

Medicare's prospective payment system assigns patients in skilled nursing facilities to a resource utilization group system (RUGS III) based on 7 categories:

- Special care
- Rehabilitation
- Clinically complex problems
- Severe behavioral problems
- Impaired cognition
- Reduced physical functioning
- Need for extensive services

These categories reflect the types and amounts of resources a patient's care is expected to cost. They are subdivided based primarily on the patient's functional dependence. This system is updated annually. The goal is to increase efficiency and avoid excessive payment for patients who require little care. Prospective per diem rates cover routine, ancillary, and capital costs of care for a patient in a skilled nursing facility.

RUGS III uses data from the Minimum Data Set (MDS), the mandated uniform assessment instrument for patients in skilled nursing facilities. The MDS requires ongoing review of patients, making it possible to link patient outcomes with RUGS categories.

Home health care: Generally, part A covers certain medical services provided in the home (eg, part-time or intermittent skilled nursing care; home health aide services incidental to skilled care; physical, speech, and occupational therapy) if they are part of a physician-approved care plan for a home-bound patient. However, amount and duration of coverage is limited. The recent implementation of a prospective payment system now limits the amount of coverage. Medical supplies are covered when billed by a home health agency.

Hospice services: Medical and support services for a terminal illness are generally covered if a physician certifies that the patient is terminally ill (estimated life expectancy of 6 mo). However, the patient must choose to receive hospice care instead of standard Medicare benefits.

Custodial care: Assistance with activities of daily living (ADLs), such as eating, dressing, toileting, and bathing, is covered in the home only when skilled care (services of a professional nurse or therapist under a physician-authorized plan of home care) is also required. Such custodial care in a skilled nursing

facility is covered when it is part of posthospital acute or rehabilitation care.

Part B

The federal government pays an average of about 75% of Part B costs, and beneficiaries pay 25%. Part B is optional; although Social Security beneficiaries are automatically enrolled in Part B at age 65, they may decline coverage (95% elect to keep Part B coverage). All beneficiaries pay a monthly premium, which varies by income—\$110.50 in 2010 for new beneficiaries whose income in 2008 was < \$85,000 (\$170,000 if they were married and filing a joint return); premiums are higher for people with a higher income. Premiums are automatically deducted from monthly Social Security checks. People who decline coverage but later change their minds must pay a surcharge based on how long they delayed enrollment. Premiums generally increase by 10% for each year's delay in enrollment, except for people who delay because they are covered by group insurance through their, their spouse's, or a family member's employer; such people do not pay the surcharge if they enroll when employment or health care coverage ends (whichever comes first). Most states have Medicare Savings Programs (see p. [3162](#)) that pay Part B premiums for people who meet certain financial qualifications.

Participants may stop coverage at any time but must pay a surcharge on the premium if they reenroll.

Covered services: Part B covers a percentage of the following: cost of physician services; outpatient hospital care (eg, emergency department care, outpatient surgery, dialysis), with certain restrictions; outpatient physical, speech, and occupational therapy; diagnostic tests, including portable x-ray services in the home; prosthetics and orthotics; and durable medical equipment for home use. If surgery is recommended, Part B covers part of the cost of an optional 2nd opinion and, if these opinions differ, a 3rd opinion.

Part B also covers medically necessary ambulance services, certain services and supplies not covered by Part A (eg, colostomy bags, prostheses), spinal manipulation by a licensed chiropractor for subluxation shown on x-ray, drugs and dental services if deemed necessary for medical treatment, optometry services related to lenses for cataracts, smoking cessation counseling, and the services of physician assistants, nurse practitioners, clinical psychologists, and clinical social workers. Outpatient mental health care, with certain limitations, is covered.

Drugs and biologicals that cannot be administered by the patient (eg, drugs given IV), some oral anticancer drugs, and certain drugs for hospice patients are covered by Part B. However, unless the patient is enrolled in a managed care program, Part B generally does not cover outpatient drugs.

Part B covers several preventive services, including bone mass measurement, serum cholesterol screening, abdominal aortic aneurysm screening, diabetes services (screening, supplies, self-care training, and eye and foot examinations), colorectal cancer screening, prostate cancer screening and prostate-specific antigen tests, an initial physical examination (the "Welcome to Medicare" examination), glaucoma screening, vaccinations (influenza, pneumococcal, hepatitis B), mammograms, and Papanicolaou (Pap) tests. Part B does not cover routine eye, foot, or dental examinations.

Physician reimbursement: Under Part B, physicians may elect to be paid directly by Medicare (assignment), receiving 80% of the allowable charge directly from the program, once the deductible has been met. If physicians accept assignment, their patients are responsible for paying only the deductible. Physicians who do not accept assignment of Medicare payments (or do so selectively) may bill patients up to 115% of the allowable charge; the patient receives reimbursement (80% of the allowable charge) from Medicare. Physicians are subject to fines if their charges exceed the maximum allowable Medicare fees. Physicians who do not accept assignment from Medicare must give patients a written estimate for elective surgery if it is > \$500. Otherwise, patients can later claim a refund from physicians for any amount paid over the allowable charge.

Medicare payments to physicians have been criticized as inadequate for the time involved in giving physical and mental status examinations and obtaining the patient history from family members. A Medicare fee schedule based on a resource-based relative value scale for physician services became effective in January 1992 in an attempt to correct this problem. The effects of the fee schedule on patient

care and on medical practice remain to be determined, but few physicians are satisfied. The paperwork and time involved in documentation have increased.

Part C (Medicare Advantage Plans)

This program (formerly called Medicare + Choice) offers several alternatives to the traditional fee-for-service programs. The alternatives are provided by private insurance companies; Medicare pays these companies a fixed amount for each beneficiary. Several different types of plans are available; they include managed care, preferred provider organizations, private fee-for-service, medical savings accounts, and special needs plans.

Medicare Advantage plans must cover at least the same level and types of benefits covered by Medicare A and B. However, Medicare Advantage plans may include additional benefits (eg, coverage for dentures, prescription drugs, or routine eyeglasses), although participants may pay an additional monthly premium for the additional benefits. Plans differ on whether participants are free to choose any physician and hospital they want, whether they can keep coverage from an employer or union, and what costs are paid out-of-pocket, including how much (if at all) they charge for a premium, whether they pay any of the Part B premium, and how much their deductible and co-payments are. Medicare Advantage plans are available in many but not all areas of the country.

Part D

Medicare Part D helps cover costs of prescription drugs. It is optional. Plans are provided by insurance or other private companies working with Medicare. There are over 1600 plans available nationwide. Premiums generally increase by an additional 1% for each month that people delay enrolling after they first become eligible for Medicare.

Covered drugs: Plans vary in the drugs they cover (formulary) as well as in pharmacies that can be used. However, formularies must include ≥ 2 effective drugs in the categories and classes of drugs most commonly prescribed for people who use Medicare. Formularies must also cover all available drugs for the following 6 classes: anticonvulsants, antidepressants, antiretroviral drugs, antineoplastics, antipsychotics, and immunosuppressants. Formularies may change over time (often annually). Formularies must also have an appeals process by which nonformulary drugs can be approved if necessary.

Benefits and costs: Costs are expected to increase annually until at least 2013. Costs in 2010 are as follows for the basic benefits (see [Fig. 316-1](#)):

- **Premiums:** Premiums vary by plan but average about \$31 yearly.
- **Annual deductible:** Patients pay the first \$310 of drug costs.
- **Co-payments:** For the next \$2520 of drug costs (after the \$310 deductible), patients pay 25% of drug costs (co-payment). Thus, the co-payment for the first \$2830 of drug costs is \$630 in addition to the \$310 deductible.
- **Coverage gap (doughnut hole):** After the first \$2830 of drug costs, people must pay 100% of the next \$3610 of drug costs—that is, until total drug costs equal \$6440 (total cost, including deductible and co-payments, is \$4550 out-of-pocket).
- **Reduced co-payments:** Once total annual drug costs are $> \$6440$, Medicare pays about 95% of additional drug costs until the end of the year.

Many companies also offer enhanced plans that provide more coverage (eg, lower deductibles or co-payments), although these plans have higher monthly premiums.

[[Fig. 316-1](#). Medicare Part D drug costs in 2010.]

People with low income and minimal assets (eg, those who have full Medicaid coverage, who belong to a Medicare Savings Program, or who get Supplemental Security Income) may be eligible for financial assistance with premiums, deductibles, and co-payments. In addition to providing insurance assistance, many states have state pharmacy assistance programs that help pay for prescription drugs, based on some combination of the person's need, age, and medical disorders; information about these programs is available from the State Health Insurance Assistance Program.

Medicaid

Funded by a federal-state partnership, Medicaid pays for health services for certain categories of the poor (including the aged poor, the blind or disabled, and low-income families with dependent children). The federal government contributes between 50% and about 76% of the payments made under each state's program; the state pays the remainder. Federal reimbursement is higher for states where incomes are lower. About 10% of the elderly receive services under Medicaid, accounting for about 40% of all Medicaid expenditures. Medicaid is the major public payer for long-term care; it contributed about 40% of the \$177.6 billion spent for long-term care services in 2006.

Covered services: Services covered under federal guidelines include inpatient and out-patient hospital care, laboratory and x-ray services, physician services, skilled nursing care, nursing home care not covered by Medicare, and many home health services for people > 21 yr.

States may cover certain other services and items, including prescription drugs (or the premiums for Medicare Part D if patients are eligible for Part D), dental services, physical therapy, rehabilitation services, and eyeglasses. Each state determines eligibility requirements, which therefore vary, but people receiving funds from cash-assistance programs (eg, the Supplemental Security Income program) must be included. Several states offer enriched packages of Medicaid services under waiver programs, which are intended to delay or prevent nursing home admission by providing additional home and community-based services (eg, day care, personal care, respite care).

Eligibility: Eligibility depends on income, assets, and personal characteristics. In 2009, people who are eligible include the following:

- All pregnant women and women with children if income is < 133% of the poverty level
- Children aged 6 to 19 yr if family income is < 100% of the poverty level
- Elderly and disabled people whose income makes them eligible for Supplemental Security Income (SSI)
- Institutionalized patients whose income is < 300% of the SSI income threshold

Most states have other criteria that allow people to qualify for Medicaid.

Assets, excluding equity in a home and certain other assets, are also considered. If the remaining assets exceed the limit, people are not eligible for Medicaid, even if their income is low. Thus, the elderly may have to spend down (ie, pay for care from personal savings and sale of assets until stringent state eligibility requirements are met) to qualify for Medicaid. How much of monthly income and of the couple's assets that the spouse of a nursing home resident may keep varies by state. Divestment of assets at below fair-market value during the 3 yr before entrance into a nursing home may delay eligibility for Medicaid benefits. Medicaid denies coverage for a period of time that is determined by the amount of inappropriately divested funds divided by the average monthly cost of nursing home care in the state. For example, if a person gives away \$10,000 in a state where the average monthly cost of care is \$3,500, Medicaid coverage is delayed by about 3 mo.

Medicaid estate recovery: Under certain circumstances, Medicaid is entitled (and sometimes required) to recover expenditures from the estates of deceased Medicaid recipients. Typically, recovery may be made only from estates of recipients who were ≥ 55 yr when they received Medicaid benefits or were permanently institutionalized regardless of age. The definition of estate varies by state. Some states

include only property that passes through probate; others include assets that pass directly (eg, through joint tenancy with right of survivorship, living trusts, or life insurance payouts). Some states protect the family home from Medicaid claims. The vigor with which claims are pursued varies by state and by case.

Medicare Savings Programs: People who are currently eligible for Medicare and whose income and assets are below certain thresholds are eligible for Medicare Savings Programs. These programs are run by individual state Medicaid programs and cover certain out-of-pocket expenses not covered by Medicare. There are several programs. The Qualified Medicare Beneficiary program covers Part A and Part B premiums, deductibles, and co-insurance; the Specified Low-income Medicare Beneficiary program and the Qualified Disabled Working Individual program pay part B premiums.

The federal government has set eligibility requirements based on income and asset value. States are free to adopt less restrictive requirements (eg, permitting enrollment at a higher income level). People enroll through state Medicaid offices.

Other Federal Programs

Veterans Health Administration: This Department of Veterans Affairs (VA) program provides health care to eligible veterans. Determining eligibility for VA benefits can be complex, and care is not always free. The VA operates > 160 hospitals, 43 domiciliary facilities, and > 130 nursing homes. It also contracts to provide care in community hospitals and nursing homes. Several innovative geriatric programs (including geriatric assessment units; Geriatric Research, Education, and Clinical Centers; and hospital-based home health care programs) have been developed within the VA system.

Tricare: This healthcare program is for active-duty service members, retired service members, and their families.

Older Americans Act (OAA): Enacted in 1965, the OAA has evolved from a program of small grants and research projects into a network of 57 state, territorial, and Indian tribal units on aging; 670 area agencies on aging; and thousands of community agencies. The primary purpose of the OAA is to develop, coordinate, and deliver a comprehensive system of services for elderly people at the community level; services include information and referral, outreach, transportation, senior centers, nutritional programs, advocacy, protective services, senior employment, ombudsman programs, and supportive services. The OAA also funds research and training. People > 60 are eligible regardless of income level.

Social Security: Although not usually considered a health program, Social Security provides basic pension payments that the elderly use for health care services. The elderly receive 2 types of payments:

- Old Age and Survivors Insurance, which is financed by Social Security trust funds and provides payments to retirees, surviving spouses, or qualified dependents
- Supplementary Security Income, which is financed from general revenues and provides a guaranteed minimum income to aged, blind, and disabled people

Title XX of the Social Security Act: This program authorizes reimbursements to states for social services, including various home health services and homemaker services (eg, meal preparation, laundry, light housekeeping, grocery shopping) for the frail elderly. These funds have shifted to the Social Services Block Grant program, which was designed to prevent or reduce inappropriate institutional care by providing for community-based care and other assistance that enables the elderly to maintain autonomy in the community. The program is defined, administered, and implemented by states; it does not support institutional care or any service covered by Medicare or Medicaid. The program covers health services only when they are an "integral but subordinate" component of an overall social service program.

Private Insurance

Medigap: About 87% of beneficiaries enrolled in fee-for-service Medicare programs have Medicare supplemental insurance policies (most are a form of Medigap insurance), which pay for some or all of Medicare deductibles and co-payments, typically in Parts A and B. People must be enrolled in Parts A and

B to be eligible to purchase Medigap insurance. People enrolled in Part C (Medicare Advantage Plan—see p. 3160) cannot purchase a Medigap policy unless they leave the Part C plan and return to original Medicare. Most Medigap insurance is purchased individually from private insurers, although employers may provide it to retirees.

There are 12 different types of Medigap insurance available, labeled A through L. Benefits are the same for all plans with the same letter, regardless of insurance carrier. No plan may duplicate Medicare benefits. The basic plan (Plan A) covers

- Hospital co-payments
- 100% of expenses eligible for coverage by Medicare Part A after Medicare hospital benefits are exhausted
- Part B co-payments

The other plans, which have higher premiums than Plan A, may provide additional coverage in a skilled nursing facility and may cover Part A and Part B deductibles, preventive medical services, and short-term home-based help with activities of daily living (ADLs) during recovery from an illness, injury, or surgery. Some of these plans, if purchased before Medicare Part D took effect, covered a percentage of the cost of outpatient prescribed drugs.

The Medigap open enrollment period begins the month people turn 65 and lasts 6 mo. During this period, people who have preexisting conditions cannot be denied coverage or charged more; however, they may be made to wait up to 6 mo before preexisting conditions are covered.

Long-term care insurance: Very few private medical insurance policies cover services such as long-term home health care or long-term nursing home care. However, some private insurers offer long-term care insurance. Such plans are useful for people who want to preserve their assets and who can afford to pay the premiums until care is needed, possibly for an extended period of time. This insurance is not recommended for people with few assets and may not be worthwhile for people who can easily pay for long-term care.

Benefits usually begin when a person can no longer do a certain number of ADLs.

Some plans, called tax-qualified plans, offer tax advantages (eg, deduction of premiums from taxable income as medical expenses).

For all long-term care services, private insurance pays for only 9%, and people pay for 22% out-of-pocket. A large proportion of out-of-pocket spending occurs as the elderly spend down to qualify for Medicaid.

Models for Comprehensive Coverage

Individually, Medicare, Medicaid, Medigap, and private long-term care insurance have shortcomings in providing comprehensive geriatric care:

- Medicare excludes long-term custodial care, some preventive services, and large amounts of prescription drug costs.
- Medicaid belatedly intervenes after the patient is impoverished.
- Medigap, like Medicare, excludes long-term care.
- Private insurance is too expensive for most of the elderly, leaves them vulnerable to financial catastrophe, and supports only fragments of long-term care.

Collectively, these programs rarely promote integration of acute and long-term care or coordination of

health and social services. However, several model projects have demonstrated that with organized delivery of services using combinations of public funding and private insurance, comprehensive geriatric care, including some long-term care, can be adequately financed.

Social health maintenance organizations (SHMOs): SHMOs are demonstration programs financed by Medicare. They use Medicare, Medicaid, and private patient payments to cover a wide range of care benefits managed by nurses, social workers, and physicians. Patients not eligible for Medicaid benefits use private payments to cover a limited amount of long-term care, principally in the home. Like an HMO, an SHMO is at financial risk for the cost of services and therefore has an incentive to manage resources carefully.

Program of All-Inclusive Care for the Elderly (PACE): PACE is designed to keep patients in the community as long as medically, socially, and financially possible. A PACE interdisciplinary team assesses patient needs and develops and implements a care plan.

PACE includes medical and dental care, adult day care (including transportation to and from the facility), health and personal care at home, prescription drugs, social services, rehabilitation, meals, nutritional counseling, and hospital and long-term care when needed. PACE programs provide social and medical services primarily in an adult day health center, supplemented by in-home and referral services. The PACE service package must include all Medicare and Medicaid covered services, and other services determined necessary by the interdisciplinary team for the care of the PACE participant. PACE may require a monthly fee.

As of 2010, 30 states have approved PACE providers.

Extended care communities: A life-care community or continuing care retirement community provides housing, health care, and other services under packaged financing and management. These communities may have a clinic, an infirmary, or even a nursing home on the site, and housing is designed to accommodate disabled people. Many of these communities serve wealthy retirees willing to sign long-term contracts for their housing and care.

Some life-care communities fail because inflation and an aging population cause costs for services to exceed income. Some communities keep costs down by providing housing and minimal services with options to purchase additional services.