

# Gait Disorders in the Elderly

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**GAIT AND BALANCE BOTH DECLINE WITH** normal, or non-pathological aging. Gait and posture tend to become parkinsonian, meaning “looks like Parkinson’s disease.”<sup>1,2</sup> This connotes a stooped posture, reduced arm swing, reduced stride length and a tendency towards a flat foot strike

However, a large number of pathological changes may develop contributing to this normal decline. Some of these involve the nervous systems, central or peripheral, and some involve non-neurological systems which not neurologically controlled.

It is obvious that gait difficulties and imbalance contribute to reduced quality of life. It is uncommon to meet a patient in a nursing home who walks normally. Gait impairment and the risk of falls is one major contributing factor to nursing home placement.

Falls are common in the elderly.<sup>3</sup> There are different definition for “fall,” but the World Health Organization definition of a fall (E880-E888 in ICD 9 and W00-W19 in ICD 10) requires the person to come to rest “inadvertently” at a lower level than intended. I consider trips and slips as different although possible indicators of a falling tendency. We all may slip on ice, or trip over a plug, but it is an indicator of a problem if it is recurrent, suggesting a problem correcting the loss of balance.

Over 30% of community dwelling people over 65 fall at least once each year<sup>4</sup> and falls were the leading cause of traumatic death and morbidity in the elderly.<sup>4</sup> The death rate from falls skyrockets with age, increasing from ten per 100,000 per year for ages 65-74, to 147 per 100,000 per year for those over age 85.<sup>5</sup> The financial costs alone are astronomical and increasing.<sup>3</sup>

The claim that “falls among older adults are preventable,” is akin to stating that cigarette smoking or drug addiction or obesity is preventable. The correct statement is, and should be, “falls in the elder can be reduced.” They cannot be prevented, partly due to impaired cognitive function that often accompanies gait

disorders in the elderly.<sup>6</sup>

My own experience, from talking to patients and from reviewing doctor notes is that many patients do not have their walking evaluated during their routine **primary care physician (PCP)** appointments. In a study of hospitalized patients, often admitted *after* a fall, gait was not documented on the chart.<sup>7</sup> The reasons for this are manifold, but I believe that two, which are virtually never discussed, are: doctors have not been taught how to evaluate gait and that most doctors lack a vocabulary for gait, and therefore have difficulty describing what they see.

Walking requires the ability to stand, maintain position (keeping center of gravity over the feet) and advance. The overall controlling mechanism is the brain, but, obviously, the feet, ankles, knees and hips must be able to bear the weight; the muscles must be sufficiently strong. The inner ear must be able to determine the direction of gravity’s pull. Binocular vision is important for judging distance and compensating for other impaired sensory systems. The peripheral nerves must convey information from the environment in to the spinal cord, and then out to the appropriate muscles at the appropriate time (“garbage in, garbage out”). And aging affects each of these systems, often in very unequal ways. Determining an exact cause of a gait abnormality is sometimes impossible, although identifying which systems contribute to the process is usually not that difficult to determine.

## Vocabulary

**Stand:** ability of patient to stand up from a chair and remain upright.

**Posture:** assess kyphosis, scoliosis, lordosis, or other deviations from normal

**Stride length:** distance between steps, which should be equal on the two sides, and appropriate for the distance and speed

**Arm swing and arm posture:** as one foot advances the contralateral arm swings. This should be symmetric and appropriate for speed.

**Base:** the distance between the feet during walking. This should be shoulder length or a little less and should remain relatively stable from step to step.

**Speed:** normal, slow or increased

**Turning:** people normally pivot when they turn. In Parkinson’s disease and other gait disorders they may take several steps. In addition, some patients lose their balance on turning or their feet freeze.

**Balance-assessed:** with a pull from behind (after warning the patient) but also assessed by observing the walking. Patients should walk in a straight line, and not veer.

**Romberg test:** originally developed as a test for tabes dorsalis (tertiary syphilis of the spinal cord), this is a general test of position sense, with the eyes closed. Cerebellar, mild vestibular and sensory disorders all may become evident. Its importance is less in the amount of sway than it is of the ability to compensate for the sway, without falling.

Gait should be assessed initially by observing the patient standing up from a chair. In my office I use the same chair each time, a firm bottom chair with armrests. The patient is asked to attempt to stand without using the arms, but if unsuccessful, with using the arms. It requires great strength to stand without using the arms, yet it requires very little leg strength to stand or to walk if the patient can keep the knees locked.

What is a “normal” gait? My own interpretation of normal is that it would not stand out as different if I saw the person walking on the street, or in a crowd.

If possible, observe the patient walk into the examining room. If that appears normal and the history doesn’t suggest a gait or balance problem, then record the gait exam as normal. If the gait is not clearly normal then it should be more formally evaluated. Ask the patient to walk ten to 15 feet.

## Common neurological gait disorders in the elderly

**Parkinsonism:** the most common, and is characterized by a small stride, stooped posture, slowness, normal base, reduced or absent armswing, absence of pivot during turning, poor balance.

**cervical myelopathy:** reduced stride, slow, excessively narrow base, tendency to walk on the balls of the feet with a circumducting stride, knees extended; armswing may be reduced or normal

**ataxic:** there are a variety of ataxic gaits. The gait of alcohol intoxication is due to midline cerebellar degeneration, and looks like a “drunken” gait, with a variable base and variable stride length, producing a lurching quality, with a loss of balance to either side. “Sensory ataxic gait” is due to reduced proprioception, often combined with other sensory reductions, to produce a wide based gait while the feet “slap” the ground, as if to increase the stimulation. Bilateral vestibular dysfunction does not cause vertigo but does cause an ataxic gait, with a wide or variable base and a tendency to lose balance to either side. In ataxic gaits, the arms are often abducted, to reduce the movement of the center of gravity. Stride length is usually somewhat reduced but often variable. Speed and turning are reduced. Unilateral cerebellar lesions cause a tendency to veer or lose balance on the ipsilateral side.

**hemi and bilat paretic:** the typical gait of a person who suffered a hemiparetic stroke involves reduced armswing on the affected side, with the elbow and hand contracted, reduced stride on the affected side, with a circumducted stride and a tendency to keep the affected knee in extension. With strokes on both sides, the gait disorder become symmetric.

**fear of falling:** this is a gait disorder seen in elderly patients with a history of falls or near falls. They take small, cautious steps, as if walking on ice.

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# Rule # 1: if a patient requires an assistive device, the reason should be recorded.

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Therapy comes after the diagnosis. The importance of physical therapy and daily exercise cannot be overstated. The risk of falls must be reduced as far as possible, but consonant with the recommendation for walking as much daily as possible. Home safety assessments by a visiting nurse service are paid for by Medicare and may recommend banisters, ramps, extra lighting, etc. Walking devices should be forcefully encouraged, especially to patients reluctant to use them either for vanity’s sake, or because of fear of becoming “dependent” on them.

When elderly patients with gait problems are hospitalized for medical problems they are often put at bedrest and rapidly decondition, sometime forever losing their ability to walk.

## CONCLUDING SUGGESTIONS

**Rule # 1:** if a patient requires an assistive device, the reason should be recorded.

**Rule # 2:** falls should be charted and the evaluation must include an assessment of gait and balance.

**Rule #3:** gait should be assessed, even if briefly, in the elderly. If the gait is abnormal, the cause must be determined, and if not adequately explained, the patient should be referred to a gait specialist, usually a neurologist.

**Rule #4:** confirm the patient’s explanation for the gait disorder. Many older patients incorrectly blame arthritis or back pain for their problems.

**Rule #5:** mobilize hospitalized elderly patients when possible and encourage exercise.

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## Further sources of information

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