



Walking Changes and Associated Implications across the Lifespan for Individuals with Cerebral Palsy

Introduction

As treatments and therapies used for the management of Cerebral Palsy (CP) continue to improve, the lifespan of most individuals with this diagnosis is extending. Ongoing health surveillance and management of evolving CP-related conditions are critical to preserving the individual's function, including their mobility and quality of life throughout the lifespan. While about 60% of persons with CP walk independently or with the use of aides by adulthood, walking can become more challenging with age.

Gross motor function and mobility is usually classified into one of five levels of the Gross Motor Function Classification System (GMFCS). Individuals classified at "GMFCS I" can generally walk without restrictions while those classified at "GMFCS V" are very limited in their ability to move themselves around even with the use of assistive technology. The GMFCS level may predict the age when walking ability may begin to decline.

Possible Causes of Walking Deterioration

Decreased walking function and mobility *may* result from the following changes (this is not an exhaustive list and some of these changes can affect the typically developing person):

- reduced muscle flexibility
- reduced strength
- reduced endurance
- reduced balance
- increased spasticity
- pain
- fatigue
- progressive crouch
- arthritis
- limited weight bearing
- contractures (shortening of muscles, tendons)
- progressive bony deformities (i.e., hip subluxation, foot deformities, scoliosis)
- stress and fragility fractures
- neurological deterioration such as spinal stenosis
- inadequate nutrition
- medications
- weight gain related to being sedentary



Impact of Walking Deterioration:

Increased challenges in walking may present as any of the following:

- greater perceived walking effort
- shorter walking distance
- slower speed
- balance problems and increased fall risk
- increased pain with weight bearing
- the need for more assistance to walk
- difficulty walking in certain environments (for example, over ramps or on grass)
- the emergence or worsening of other adverse factors (e.g. difficulty breathing, pain, and/or fatigue)

As persons with CP age they become at greater risk for a decline in walking ability. Individuals who are stronger as they enter adulthood and who work at staying active will maintain their abilities longer.

Pain

The most commonly reported medical complaint by adults with CP is musculoskeletal pain, which may lead to increased challenges in mobility, self-care, and overall function. More information about pain is available at

<https://www.aacpdm.org/UserFiles/file/fact-sheet-pain-011516.pdf>.

Balance

Balance tends to decline normally with age, as with typical aging, but this process may be accelerated in persons with CP. Many individuals with CP report that they begin to walk less because of balance issues. Difficulty with postural responses and adjustments are reported as the two greatest challenges affecting balance.

Medical Consequences

Decreased activity in persons with CP may also increase the likelihood of certain diseases such as type II diabetes, obesity, and cardiovascular disease.

Fatigue

Individuals with CP have reported an increased incidence of fatigue as they age, which can impair their ability to perform daily life tasks. The reasons for fatigue may be multifactorial, for example: physical fatigue related to the increased work of walking. More information is available at <https://www.aacpdm.org/UserFiles/file/FatigueFactSheet.pdf>



Spasticity/Contractures/Deformities

As a result of the injury to the brain which characterizes CP, spasticity (or abnormal 'tone') develops. This is most often experienced as a tightness or stiffness of the muscles. Over time, muscles, tendons, and joints may lose their range of movement, becoming stiff and less functional. Unfavorable biomechanical positions of joints and muscles lead to poor walking efficiency, accelerated joint wear (arthritis), and pain. This change can start early in adolescence so maintaining joint mobility, muscle flexibility, and strength is important.

Prevention

- Participating in physical activity, physical fitness, and adaptive sports is encouraged to maintain optimal strength, endurance, flexibility, and balance. Strength training does not increase spasticity and may improve walking. More information about physical fitness and exercise for adults with CP is available at <https://www.aacpdm.org/UserFiles/file/IC19-van-der-Slot.pdf>.
- If finding an accessible fitness facility is difficult, consider a referral to a rehabilitation center followed by a home exercise program for maintenance. They may be able to assist in finding an appropriate facility. Increased social interactions and group activities also increase confidence and willingness to participate in social activities.
- Fall prevention strategies should be discussed with persons who experience reduced mobility.
- Interventions to reduce the energy exerted for mobility may help the individual reduce fatigue or pain.
- Understanding each person's priorities, such as school, work, socializing, or recreational activities will help to establish goals. Overuse injuries may lead to mobility difficulties and should be avoided.
- Several mobility options such as walking aids, bikes/trykes, or wheelchairs (manual or powered) should be explored in different settings and environments to maintain efficient mobility and to reduce the risk of pain, physical fatigue, and fear of falling.

Summary

Multiple studies report that people at GMFCS level I-II have lower rates of walking difficulties. Individuals who are older, those who are less able to walk, and those with higher levels of pain or fatigue, are at higher risk for mobility challenges. Rehabilitation programs need to address pain, fatigue, reduced balance, and mobility as well as deconditioning, and physical activity should be encouraged as it offers various health benefits and may help maintain walking ability.



References:

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