

## Introducing Gait Function Scale to Quantify the Capacity to Walk Independently from Least Functional to Most Functional

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**Abstract :** The objective of this work is to quantify the independent walking functionality, depending on the use of braces, assistive devices, and walking distance. This study included twenty-one patients suffering from neurological disorders, musculoskeletal injuries, old age, and diabetic foot; their ages ranged from 26 to 77 years old. The patients can walk reciprocally and independently, using braces or assistive devices or not. Individual gait evaluation is done using the Gait Function Scale (GFS) based on three factors: using orthosis, using assistive devices, and distance. The scale doesn't consider the types of pathological gait abnormalities related to neurological conditions such as waddling and hemiplegic gait, and the kinetic gait analysis is based on the force and the moment during the gait cycle. The GFS consists of sixteen levels; the least is zero (0) for no independent reciprocal walking, and the highest level is sixteen (16) when walking twenty meters long without braces and assistive devices. Results: According to the Gait Function Scale, a C5-6 quadriplegic case has a score of zero (0), a paraplegia cauda equine injury has a score minus five (5-), a transverse myelitis has a score minus eight (8-), an elderly with a diabetic foot has a score plus eight (8+), a Parkinson, a hemiparetic and a paraplegic patients have a score minus eleven (11-), a multiple sclerosis female and a postoperative total hip replacement male have a score plus eleven (11+), an old age female has a score twelve (12), a transverse myelitis male has a score plus twelve (12+), a hemiplegia has score plus thirteen (13+), a transverse myelitis male and a hemiplegia have a score minus fifteen (15-), a multiple sclerotic female has a score fifteen (15), a postoperative ACL reconstruction patient and a transverse myelitis male have a score plus fifteen (15+), A Parkinson and hemiplegic patients have a score of sixteen (16), a sensory ataxic and a postoperative knee replacement patients have a score plus sixteen (16+). Conclusion: It was concluded that the Gait Function Scale provides an objective evaluation that quantifies independent gait functionality. It acts as a road map, aiming to upgrade each level to the next grade. Furthermore, it aids in following up with the patients and evaluating the treatment intervention and rehabilitation program.

**Keywords :** functional, gait, independent, walking

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