

SPECIAL ARTICLE
MOTION ANALYSIS

Gait analysis: clinical facts

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ABSTRACT

Gait analysis is a well-established tool for the quantitative assessment of gait disturbances providing functional diagnosis, assessment for treatment planning, and monitoring of disease progress. There is a large volume of literature on the research use of gait analysis, but evidence on its clinical routine use supports a favorable cost-benefit ratio in a limited number of conditions. Initially gait analysis was introduced to clinical practice to improve the management of children with cerebral palsy. However, there is good evidence to extend its use to patients with various upper motor neuron diseases, and to lower limb amputation. Thereby, the methodology for properly conducting and interpreting the exam is of paramount relevance. Appropriateness of gait analysis prescription and reliability of data obtained are required in the clinical environment. This paper provides an overview on guidelines for managing a clinical gait analysis service and on the principal clinical domains of its application: cerebral palsy, stroke, traumatic brain injury and lower limb amputation.

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Gait is the most important method of human locomotion characterized by periods of loading and unloading of the limbs to move around, providing independence. It allows many of the activities of daily living, sports, facilitates many social activities, and it is required in many occupations. Clinical gait analysis is the process of recording and interpreting biomechanical measurements of walking in order to support clinical decision-making in case of gait dysfunction.

Gait deviations from the typical pattern are often characteristic of specific neurological, muscular or skeletal pathology. It is assumed that, whilst the analysis is of walking, management decisions based on the information supplied will have benefits across a much wider range of functions and activities.¹

Baker² has modified earlier work by Brand^{3, 4} to define four potential reasons for performing a clinical gait

analysis; diagnosis, assessment, monitoring and prediction (Table I). While gait analysis sometimes suggests particular pathologies it is quite rare for it to be relied upon for definitive diagnoses. The most common use is for assessment of patients with a known condition prior to planning treatment. Objective measurements can also be extremely useful for monitoring progress. If an intervention is performed between assessments, then monitoring is essentially outcome evaluation. Evaluation of changes in such technical biomechanical measures is generally of more use to the clinician, to help

TABLE I.—Reasons for performing a clinical gait analysis.

1. Diagnosis between disease entities
2. Assessment of the severity, extent or nature of a disease or injury
3. Monitoring progress in the presence or absence of intervention
4. Prediction of the outcome of intervention (or the absence of intervention)