ELSEVIER

J. Electromyogr. Kinesiol. Vol. 7, No. 4, pp. 251–257, 1997

Printed in Great Britain
1050–6411/97 $17.00 + 0.00

PII: S1050-6411(97)00008-4

Reflections on Clinical Gait Analysis

Roy B. Davis

Connecticut Children's Medical Center, Hartford, CT 06106, U.S.A.

Summary: Clinical gait analysis allows the measurement and assessment of walking biomechanics, which facilitates the identification of abnormal characteristics and the recommendation of treatment alternatives. The predominant methods for this analysis currently include the tracking of external markers placed on the patient, the monitoring of patient/ground interaction (e.g. ground reaction forces), and the recording of muscle electromyographic (EMG) activity, all during gait. These data allow the computation of stride and temporal parameters, joint/segment kinematics, joint kinetics, and EMG plots that are used to gain a better understanding of a patient's walking difficulties. Gait interpretation involves a systemic evaluation of each of these types of data, noting both corroborating and conflicting information while identifying functionally significant deviations from the normal. Understanding the etiology of these abnormalities allows the formulation of a treatment plan that may involve physical therapy, bracing, and/or surgery. This process is challenging because of the complexity of the motion, neuromuscular involvement of the patient (e.g. dynamic spasticity), variability of treatment outcome, and on occasion, uncertainty about the quality of the gait data. The experience of the interpretation team with respect to gait biomechanics, a particular patient population, and the effectiveness of different treatment modalities is the principal determinant of the success of this approach. The clinical gait analysis process continues to evolve positively. It has become more comprehensive and meaningful because of an improved understanding of normal gait biomechanics and more rigorous data collection/reduction protocols that complement accumulated clinically relevant experience. © 1997 Elsevier Science Ltd. All rights reserved

Key Words: Clinical gait analysis—Walking—Locomotion assessment.

J. Electromyogr. Kinesiol., Vol. **7**, 251–257, December

INTRODUCTION

Clinical gait analysis involves the measurement of fundamental biodynamic parameters, the compilation of these basic data into an information set, the systematic interpretation of the compiled information with respect to the identification of deviations from 'normal' patterns or values and the understanding of the causation of these abnormalities, and the recommendation of treatment alternatives for individual patients on a case-by-case basis. This approach has found good utilization in the assessment of pathological gait where motions are often complex, multi-planar, and distorted relative to a fixed observer. By far the most prevalent use of clinical gait analysis is in the assessment of children and adolescents with cerebral palsy (CP) in treatment (predominantly orthopaedic surgery) plan-

Correspondence and reprint requests to R. B. Davis, Gait Analysis Laboratory, Connecticut Children's Medical Center, 282 Washington Street, Hartford, CT 06106, U.S.A.