Patients’ walking disabilities were first diagnosed with the trained eye of an informed examiner. Motion deviations were observed and the cause extrapolated from a knowledge of normal muscle function. This approach still meets the needs of some disabilities, but is inadequate for many others.

Today, technical advances allow the quantification of motion analysis to three-dimensional accuracy and have expanded the dimensions of ground reactions forces to power calculations. Dynamic EMG similarly delineates the timing and intensity of the muscles to define abnormalities in control. Most recently, advanced mechanics and computer graphics have provided a means of qualifying and displaying the muscle forces involved in gait. Model design, however, begins with the analysis of normal function. Can these models be transferred directly to the disabled? The designers must accept the challenge to confirm that the differences attributed to pathology accurately reflect the patient’s mixture of reduced passive joint mobility, weakness and/or spasticity. The practice of considering the joints individually must be extended to include the reactions within the whole limb.

Communication is critical. As engineering sophistication in gait analysis progresses, there must be a concerted effort to present the developments in terms that the practicing clinicians will understand. The engineer’s language is numbers, signs, and formulae. Clinicians analyze their patients and plan their treatment according to specific motions and muscles. For optimum transfer of the engineering accomplishments to patient care, the language of the clinician must be the communication path.

Amidst the technical accomplishments is the need to preserve the quality of observational gait analysis. This technique remains the first step in the treatment of patients’ gait abnormalities. If the physician fails to identify a problem, the therapeutic need will be missed. Physical therapists use their observational skills for treatment planning and evaluation. Orthotists and prosthetists depend on observation to evaluate the functional success of their devices. The concluding principle is that the purpose of gait analysis is to improve the patient’s ability to walk. The analytical technique selected should be in balance with the level of need and objectivity.

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