

Gait Analysis in Prosthetics: Opinions, Ideas and conclusions

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Background: Since the introduction of instrumented gait analysis it has been used in measuring the gait of amputees walking with prostheses.

Objectives: A review was performed of the literature of the last eleven years (1990-2000) with the topic: "clinical use of instrumented gait analysis in patients wearing a prosthesis of the lower limb" in order to assess the value of this instrumented gait analysis in relation to clinical practice.

Criteria for selecting studies for this review:

Types of studies: NA

Types of participants: TTA and TFA due to trauma, congenital, and vascular causes.

Types of interventions and outcome measures:

The reviews were divided into five subtopics:

- 1) adaptive strategies in gait (velocity of walking, influence of limb alignment on the gait).
- 2) the influence of different parts of the prosthesis on gait (characteristics in gait of SACH vs. Flex-foot).
- 3) pressure measurements in the socket in gait studies (pressure distribution in the socket was measured during gait in a handcast fabricated patellar-tendon-bearing PTB socket, a hydrocast-method fabricated socket, and a PTB socket).
- 4) the influence of the mass of the prostheses on gait (changes in gait, equal ground reaction forces)
- 5) energy considerations in gait (energy exerted, efficacy of gait, walking velocity, metabolically efficient velocity)

Search strategy for identification of studies: literature search was performed in Embase, Medline and Recal.

Conclusion: Instrumented gait analysis in prosthetics provides better insights and knowledge of the different adaptive mechanisms of the body in walking with a prosthesis. Most instrumented gait studies are done in a gait laboratory. This is not comparable with the patient's home or work situation. Instrumented gait studies assess only the impairments. Assessment of disabilities and the subjective opinion of the patients' remain necessary. It is the authors' opinion that the future of instrumented gait analysis in prosthetics is mainly for scientific research in which one should critically consider the number of patients to be studied, to show some clinically relevant differences. It is also important to test new prosthetic components, to investigate whether they improve the gait of the amputee wearing the prosthesis.