

Scientific/Educational Workshop

Workshop title

Dynamic balance during walking: what can we learn from different patient groups?

Workshop responsible

Hans Rietman (Roessingh Research and Development / University of Twente)

Speakers

Prof. dr. Hans Rietman;
Prof. dr. Zlatko Matjačić;
Dr. Edwin van Asseldonk;
Dr. Erik Prinsen

Workshop goals

The goal of this workshop is to present the results of dynamic balance perturbation experiments performed during walking in three distinct patient groups: (1) individuals with a spinal cord injury; (2) stroke survivors; and (3) individuals with a transfemoral amputation. During the workshop we will explore what we can learn from each of these groups, where the parallels between groups are and how the results of the experiment can be used for future rehabilitation technology development.

Abstract

Dynamic balance perturbation experiments during walking have taken a flight over the last decade. Numerous experiments have been performed on non-impaired individuals to investigate what the biomechanical mechanisms are by which they respond to dynamic balance perturbations. Recently, experiments have also been performed on different patient groups. Comparing the results of these experiments is interesting, because it shows us what the influence of the pathology-related impairments on balance control is. In this workshop results of dynamic balance perturbation experiments during walking in three different patient groups will be discussed: (1) individuals with a spinal cord injury; (2) stroke survivors; and (3) individuals with a transfemoral amputation. Each of these groups can show different reactions but there are also similarities to discuss. Individuals with a spinal cord injury will have a (bilateral) neurological impairment under the lesion side with intact neurological control above the injury site. Stroke survivors will have unilateral neurological impairments where usually the arm and leg are affected. Individuals with a transfemoral amputation, finally, have unilateral musculoskeletal impairments of which the lack of ankle strategy on the amputated side are the predominant challenge from a balance perspective. The workshop will start by discussing general principles of balance control in each of the patient groups followed by the presentation of experimental research results. After this, a panel discussion will be held to discuss what we can learn from each of these patient groups. This discussion will be primarily linked to what the results implicate for rehabilitation and rehabilitation technology in particular.