An accurate, reliable instrument and solution for measuring and training postural balance

- Physiotherapy
- Neurology
- Ear, Nose and Throat
- Sports Medicine
- Occupational Medicine
- Orthopaedics and Surgery
- Gerontology and Geriatrics
- Physical Medicine and Rehabilitation
A reliable and valid measurement of the functioning of posture control mechanisms is a prerequisite for discovering the reasons for balance problems or evaluating the effects of treatment and rehabilitation. The Good Balance System, developed in close cooperation with research and clinical work, is the answer to this need. The solutions are based on modern digital wireless technology.

**Measuring**

On the basis of the force signals the system produces a dimensional curve showing the amount and characteristics of postural sway throughout the registration period. The results can be calculated as absolute units or in units adjusted for body height.

The software also calculates several variables describing the quantitative aspects of individual's test behaviour, e.g. amount and speed of anterior-posterior and medial-lateral sway, amplitude of sway, the first moment of sway velocity (combined amplitude and velocity of the movement of the center of pressure), power spectrum analysis (FFT analysis) etc. Products are based on representative large scale normative data (more than 7000 subjects, 8-100 years, males and females separately) that no other balance system can offer to the users.

**Comparing and Analysing**

It is possible to compare the curves and the values of several tests simultaneously on the computer screen. The system shows the values of the variables obtained for each test/subject and their relative (percentages) or absolute differences.

The sample shows the results for the same subject in the same type of test before, during and after a four weeks' training period. The 76-year-old lady could improve her postural balance compared to other females in her age from the second worst level to the second best (4/5->2/5). The lady practised 3 times a week 30 minutes with the Good Balance training program.

The results of the tests can easily be exported e.g. into an Excel file for further statistical analysis. The trigger functions (two out going and four in going trigger marks) make it possible to synchronize Good Balance with other measurement systems, such as EMG registration or movement analysis.
Standing Symmetry

It is also possible to measure the relative loading of both legs and to demonstrate any postural asymmetry to the test person. This feature also enables the learning to recognize the real meaning of possible restrictions of loading e.g. on a leg which has been operated.

Training with Biofeedback

The Good Balance biofeedback balance training has been shown to be effective. This training is also fun, easy to learn and well motivating. Patients can monitor their progress. It is widely used in physiotherapy with neurologic, orthopaedic and geriatric patients.

- Ready-made or user defined training courses
- Easy-to-tailor exercise programs depending on individual needs
- Possibility to train functional dynamic movements

Technical specifications

Weight:
Force platform with integrated electronics: 10.5 kg

Dimensions:
Force platform: 800 mm * 800 mm * 800 mm, height 110 mm

Power supply: 110-230 VAC/9 VDC, 3 W

Operating system: MS Windows 2000 or higher

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Standards

The Good Balance system fulfils the standards governing electric medical instruments for user and patient safety (EN 60601-1) and electromagnetic compatibility (EN 60601-1-2, 1993 and EN 55011, 1991). Medical CE certificate (NB ID 0537), FDA certificate (USA), SDA certificate (Republic of Korea), SDA certificate (People’s Republic of China). Certified Quality System (ISO 9002).
Roots in Scientific Research and Clinical Experience

The history of Good Balance traces back to scientific studies carried out, in particular, at the University of Jyväskylä, Finland since the early 1980’s. New methods were needed to analyse the of the postural control system in studies dealing with changes in functional capacity during aging (e.g. Era & Heikkinen 1985, Era et al. 1996a), training of balance in elderly subjects (Sihvonen et al. 2004a), balance deficits in neurological patients (Era et al. 1991, Pyöriä et al. 2004) and also the role of postural balance in highly skilled motor performance, such as top level rifle shooting (Era et al. 1996b).

Good Balance was developed on the basis of this work and enriched by experience in using the system also in clinical work and rehabilitation.

The usefulness of training of balance by the help of visual bio feedback provided by the Good Balance system to improve balance and reduce the risk of falling has been shown e.g. in a controlled experimental study among frail elderly women (Sihvonen et al. 2004a,b). The study by Viitasalo et al. (2000) indicated the effectiveness of auditory bio feedback of balance during shooting training in young recruits.

Good Balance was also used in a major national health survey named Health 2000 (Era et al. 2006). This study was based on a random sample of about 8 000 subjects aged 30 years and above. The sample represents the whole population of Finland of this age. The participation rate was about 80 %. This study provides to the users of Good Balance an exceptional source of reference values for balance tests.

References


The Good Balance system is used, among others, by:

- Department of Geriatric Medicine, Waid Spital, Zürich, Switzerland
- Department of Geriatric Medicine, University Hospital of Copenhagen, Denmark
- Initiative for Accident Prevention, Health Service Division, Odense, Denmark
- Department of Physical Medicine and Rehabilitation, University Hospitals of Helsinki, Oulu, Tampere and Turku, Finland
- Department of Neurology, University Hospital of Tampere, Finland
- Brain Research and Rehabilitation Center Neuron, Kuopio, Finland
- Finnish Institute of Occupational Health, Finland
- Research Institute for Olympic Sports, Finland
- Beijing Sports University, People’s Republic of China
- Geriatric Centre of Ulm, Ulm University Hospital, Germany
- National Institutes of Aging, USA