

The Scientific Side of a Revolution

Muscle training, reduction of strain on knees, hips and back, support in weight loss, positive influence on fitness, wellness and health: international scientific studies verify the high effectiveness of the Swiss footwear technology MBT.

"The greatest invention since the wheel!", "... they helped me get rid of my back pain ...", "... greatly helped me lose weight ...", "... an unbelievably effective training tool for your whole body ...", "I simply feel better!" – MBT users in over 20 countries testify to the many practical effects of the physiological footwear from Switzerland. Even scientists began investigating the MBT phenomenon to find out what was really behind Swiss engineer Karl Müller's invention, which the media have called the "wonder shoe."

About a dozen different independent studies have now been carried out by renowned scientists, institutes and universities around the world on the subject of Masai Barefoot Technology. The most important of these studies are available online at www.mbt-info.com or directly from MBT. Two of the most interesting studies were done by the University of Calgary, in Canada, and Sheffield Hallam University, in Great Britain. Here is a brief summary of the sensational results of each study:

Dr. Benno M. Nigg, Human Performance Laboratory, University of Calgary, Canada

Dr. Benno Nigg is professor of biomechanics and director of the internationally renowned Human Performance Laboratory (HPL) at Canada's University of Calgary. The HPL is a multidisciplinary research group with a staff of some 100 people, of which 16 are professors with research backgrounds in anatomy, physiology, motor control, biochemistry and biomechanics. The HPL is specialized to study the mechanical and neuro-physiological effects of medical devices for prevention and rehabilitation of movement-related pain. In summer 2004 the HPL studied the effects of Masai Barefoot Technology on the human body.

The starting point of the research work by Dr. Nigg and his team was the simple observation that the human body requires stability while standing and walking. This is usually provided by conventional street or sport shoes: they secure and stabilize the foot. The foot and leg muscles could provide the necessary stability themselves, as they do when one walks barefoot.

"However, when using shoes that provide stability," observed Dr. Nigg in the study, "the muscles contributing to static and dynamic stability get weaker because they are not used."

For this reason, many people train these under-activated muscles, using unstable situations like a wobble board, but according to Dr. Nigg, it is more logical that "training of lower extremity muscles should be combined with the actual locomotion activities."

Footwear from MBT trains precisely the muscle groups that are under-used in daily life – and very efficiently, as the HPL in Calgary concluded after comprehensive tests: the study was based on the data of test subjects who used the MBT device on the average of 9.5 hours per

day for two weeks. Specifically, kinematics, kinetics, muscle activity, soft tissue vibrations and oxygen consumption during walking were assessed.

- "During standing, the MBT device acts as a mechanical muscle training device in the lower extremities."
- "During walking, the MBT device acts as a mechanical training device for the muscles crossing the ankle joint."

Dr. Nigg and his research team also recognized other positive effects of MBT physiological footwear: the reduction of joint loading and the increased oxygen intake and thereby the increased calorie consumption.

- "During walking, the MBT device reduces the rotational ankle joint impulses for the knee joint by an average of 19 %. Thus, MBTs reduce mechanically the forces at the knee and hip joint. This result is typically associated with a reduction of joint pain."
- "During walking, the MBT device required 2.5 % more oxygen consumption for the same performance, which translates into a higher training effect."

Sheffield Hallam University, Sheffield, UK

In summer 2004, Tim Vernon and Grace Pettit of the Centre for Sport and Exercise Science, Jonathan Wheat of the Faculty of Health and Wellbeing at Sheffield Hallam University and Dr. Rav Naik of the Far Lane Medical Centre studied the function of Masai Barefoot Technology in overcoming problems of the locomotor system.

In comparisons of test subjects wearing conventional shoes with those wearing MBTs, the British scientists first noticed an alteration in gait characteristics, which was confirmed by measurements. The patented construction of the MBT has a positive effect on the angle of the ankle and the trunk during walking.

A quotation from the British study: "MBT shoes promote less forward lean during locomotion suggesting a more upright posture. (...) This, in conjunction with the lower hip moments experienced in the MBT condition, may suggest reduced loading of the lower back." This reduced loading explains the distinct reduction of back pain reported by MBT users.

The main findings of the study done by Sheffield Hallam University relate to the forces and strains put on the body during walking, which is seen as the primary source of many problems of the locomotor system. These strains are clearly diminished when MBTs are worn as opposed to conventional shoes, which relieves the entire locomotor system and alleviates pain.

The primary cause of all the positive effects of the MBT is the training of various muscle groups. This training effect was studied in detail at Sheffield Hallam University:

- MBT increases the activity of the posterior muscle during walking by an average of 9%.
- MBT increases the muscle activity of the lower extremities during walking by an average of 18%.

- MBT increases the activity of the rear thigh flexor muscles during walking by an average of 19%.

The conclusion of the Sheffield study: "(...) MBTs alter certain gait characteristics and that with frequent use they may reduce or prevent the incidence of some musculo-skeletal problems."