

Fast Forward to the Future

President's
Report **2013**

Training the Brain to Improve Walking

Walking fast and slow simultaneously



Dr. Simona Bar-Haim and her student with the split-tread treadmill at the new Laboratory for Rehabilitation and Motor Control of Walking

Physical disabilities with brain involvement are often asymmetrical. Stroke, for instance, can paralyze one side of the body, while cerebral palsy can affect one side of the body more severely than the other.

Dr. Simona Bar-Haim of the Department of Physiotherapy is pioneering a physiotherapeutic walking treatment that separates each leg and trains them separately. In her new Laboratory for Rehabilitation and Motor Control of Walking, she has a split-tread treadmill that can calibrate each belt to a different pace and monitor the brain activity of people with cerebral palsy to observe how they respond while walking.

"There is a plasticity to the brain – we can treat each leg separately and after the treatment there is a lasting 'after effect.' Some patients respond very well, while others don't. We are trying to figure

out who and why and whether it correlates with the location of the brain damage."

The hi-tech method that Bar-Haim uses could supplant the more traditional methods of gymnastics and physical therapy. Ever the scientist, she has set up control groups to compare treatment successes, hi-tech versus low-tech. There's an interesting twist – her control groups are in the Arab world.

"I formed a coalition about eight years ago to encourage treatment in the Arab world and to encourage women – both as patients and practitioners. We have groups in Jordan, the PA, and Morocco. They use the low-tech methods and I use the hi-tech one and we compare results," she explains.

Working together with Prof. Amir Karniel, chair of the Department of Biomedical Engineering, Bar-Haim's latest project focuses on teenagers with cerebral palsy in the Middle East (CP-PALS). Funded by USAID, the research is just getting started.

Bar-Haim is also the founder of a start-up called Step of Mind, where she developed a unique rehabilitative tool – a pair of shoes based on chaos theory – that is helping people around the world walk again.

