

Letter to the Editor

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In reply to Dr V Dietz

My colleagues and I appreciate the comments submitted by Drs Dietz and Field-Fote. I would like to respond briefly to their presentations: (a) in our group of ASIA C subjects (Ss), the range of lower extremity motor scores are 10–15/50 with muscle strength grades no greater than 2/5. Within this limitation, PWBT training (5 days per week for greater than 4 months) with/without activation of 'flexor reflex afferents' for phase-dependent modulation of the swing phase of the gait cycle (e.g.,¹) is successful for inducing a rather well-organized locomotion pattern. However, this is always accompanied by an extremely high 'sense of effort' and early fatigue during over ground walking. Moreover, within the context of such substantial sub-functional motor power during over ground walking, we are often confronted with safety issues due to instability during the stance phase and untoward aperiodic muscle spasms, particularly when electrical stimulation of peripheral nerves is used. In our estimation, PWBT alone or accompanied by flexor reflex activation by stimulation of peripheral nerves in 'low level' ASIA C Ss does not produce a functional outcome corresponding to that described in our paper with respect to the overground distances traversed with a relatively low sense of effort.² In fact, the metabolic costs may be excessive. Clearly, sensory ESCS created an advantageous environment for facilitating locomotor patterns (developed by PWBT training) with suitable stability and safety within reasonable metabolic costs. (b) Kinematic and EMG data will be a focus

of a paper to be submitted in the very near future. I agree that this data will be helpful in understanding the mechanisms underlying the facilitated locomotor patterns. I thought that the presentation of some metabolic data would emphasize our specific interests in the interaction between the neural and metabolic control systems governing preferred locomotor patterns and the sense of effort during the training process. (c) Given that our subject's walking speed was insufficient to meet some limited criteria for community ambulation, he nevertheless was able to walk to and from his car to his home, a shopping center and a restaurant and could ambulate through a cross-walk. In our terms, his endurance during walking over considerable distances on the pavement was remarkable.

RM Herman

References

- 1 Herman RM *et al.* Phase-dependent reflexes during stereotyped movements in man: cycling and locomotion. In: Wernig A (ed). *Plasticity of Motoneuronal Connections. Restorative Neurology*. Vol. 5. Amsterdam: Elsevier, 1991; pp 453–460.
- 2 Herman R *et al.* Spinal cord stimulation facilitates functional walking in a chronic, incomplete spinal cord injured. *Spinal Cord* 2002; **40**: 65–68.