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Spinal and supraspinal adaptations associated with balance training and their functional relevance

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**Résumé / Abstract**

Traditionally, balance training has been used to rehabilitate ankle injuries and postural deficits. Prospective studies have shown preventive effects with respect to ankle and knee joint injuries. Presently, balance training is not only applied for rehabilitation and prevention but also for improving motor **performance**, especially muscle power. The recent application of noninvasive electrophysiological **and brain imaging techniques revealed insights into the central control of posture and the adaptations induced by balance training. This information is important for our understanding of the basic control and adaptation mechanisms** and to conceptualize appropriate training programmes for athletes, elderly people and patients. The present review presents neurophysiological adaptations induced by balance training and their influence on motor behaviour. **It emphasizes the plasticity of the sensorimotor system, particularly the spinal and supraspinal structures. The relevance of balance training is highlighted with respect to athletic performance, postural control within elderly people as well as injury prevention and rehabilitation.**

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