INTRODUCTION / INTRODUCTION

What I always wanted to know about instability training

Jonathon R. Fowles

Abstract: A very popular mode of training in recent years has been the use of instability devices and exercises to train the core musculature. Instability training is viewed by many as the most effective way to train the core; however, evidence on this topic paints a slightly different picture. An extensive review of the literature by Behm et al. 2010 (Appl. Physiol. Metab. Nutr. **35**(1): 91–108) identified the fact that instability training can increase core muscle activation, but it may not be the best choice in all situations. Unstable training can reduce overall muscular power output, which may have important implications if the goal of a given training program is to maximize the output or physiological stress on a given muscle, as is the case in certain types of athletic training or in certain clinical exercise situations. Nevertheless, the balance of this evidence leads to the recommendations in the position stand (Behm et al. 2010, Appl. Physiol. Metab. Nutr. **35**(1): 109–112) that instability training can play an important role as part of an overall periodized program for an athlete, as part of a rehabilitation program in recovery from injury, or as an interesting and novel training mode for the general population in pursuit of musculoskeletal health benefits who may not have access to or want to complete more intensive free-weight training programs. More research is needed to establish the effectiveness of instability training in preventing injury in sports, enhancing on-field sport performance, or for use in various clinical situations outside of rehabilitation for low back pain.

Key words: resistance training, trunk muscles, back, balance, stability.

Résumé : Ces dernières années, il est très populaire d'entraîner les muscles profonds du tronc à l'aide d'appareils et d'exercices de déstabilisation. Selon plusieurs, l'entraînement par déstabilisation constitue le meilleur entraînement des muscles profonds du tronc; en revanche, les données probantes révèlent un autre constat. Dans une revue de la littérature exhaustive, Behm et coll. 2010 (Appl. Physiol. Metab. Nutr. **35**(1) : 91–108) indiquent que l'entraînement par déstabilisation peut améliorer l'activation des muscles profonds du tronc, mais ne constitue pas la meilleure stratégie en toutes situations, car cet entraînement peut abaisser la production globale de puissance des muscles profonds du tronc. Ces observations peuvent avoir des répercussions importantes lorsque l'objectif dans un programme d'entraînement est de maximiser la production de puissance ou le stress physiologique d'un muscle donné comme on le note dans des formes d'entraînement sportif ou dans des conditions cliniques d'exercices. Néanmoins, les données probantes plaident en faveur de l'énoncé de principe présenté dans ce numéro (Behm et coll. 2010, Appl. Physiol. Metab. Nutr. **35**(1) : 109–112) : l'entraînement par déstabilisation constitue une facette importante dans l'ensemble du programme périodisé d'un athlète et dans la phase de récupération d'un programme de réadaptation. C'est aussi un apport intéressant dans un programme d'entraînement destiné à la population en général qui ne veut pas ou n'a pas accès à des programmes plus exigeants avec des poids libres, mais qui s'attend à des gains sur le plan de la santé musculosquelettique. Il faut mener d'autres études pour mieux connaître l'efficacité de l'entraînement par déstabilisation sur la diminution des risques de blessures sportives et l'amélioration de la performance sportive sur le terrain. De plus, d'autres études permettront d'établir les diverses conditions cliniques de son application en sus de la réadaptation des lombalgies.

Mots-clés : entraînement avec charge, muscles du tronc, dos, équilibre, stabilité.

[Traduit par la Rédaction]

There are numerous purported and perceived benefits to the use of instability training devices and methods in common training practice; however, many questions prevail regarding the implementation and effectiveness of this type of training: How effective are instability methods in activating the core muscles? When is it appropriate to start someone using a stability ball or wobble board? How many exercises should I do using instability methods? Should I use instabil-

Received 1 December 2009. Accepted 1 December 2009. Published on the NRC Research Press Web site at apnm.nrc.ca on 22 January 2010.

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ity training in rehabilitation from injury or prevention of injury? Should I use instability training for athletes? Which sports performances would benefit from greater use of instability methods? Behm and colleagues (2010*a*) address many of these questions in the position stand for the Canadian Society for Exercise Physiology, published in this issue. A thorough review of the evidence appears in a separate article, also published in this issue (Behm et al. 2010*b*), and provides a history of instability training development, the neuromechanical basis of core stability, assessment of core stability, and the use of instability training in many different training contexts. Valuable information for the practitioner is provided regarding the specificity of exercise programming for the core with use of unstable devices, machines, free weights, isolation exercises, and different prescriptive variables. The actual position stand provides a brief synopsis of the evidence from instability training studies and provides important recommendations regarding the use of instability training in training the core for athletes, for people undergoing rehabilitation, and for the general population.

The evidence shows that core stability cannot be achieved through the activation of a single muscle, and core training cannot be achieved through the prescription of any single exercise. The authors note that training programs must be structured so that athletes, nonathletes, and workers are prepared for the wide variety of postures and external forces encountered during the many challenges they face in sport, work, and daily life. It is true that, for a given exercise, the use of instability methods can increase core muscle activation; however, many ground-based exercises also can provide greater overall training loads to both the core and the peripheral muscles and, therefore, may provide greater training potential for the development of certain qualities, such as muscular strength and power. This rationale explains why there is less consistent evidence of the effects of instability training on elite sports performance, and supports the notion that a well-designed program should include a wide variety of exercises that encompass all planes of movement, including stable and unstable types of training. In both rehabilitation and general fitness conditioning settings, the utilization of unstable devices has been shown to be effective in decreasing the incidence of low back pain and in increasing sensory and motor efficiency, so there is utility in these exercises. The overall message from this work is that instability training can provide a novel training stress in a variety of situations, but should not be considered the be-all and end-all. The evidence supports the use of instability training as part of an overall training program, but, just like many other types of training, should not be used exclusively in replacement of traditional exercises in an overall balanced program, especially if the goal is higher-intensity training for both the core and peripheral musculature.

The authors acknowledge that many general trainers or athletes may still want to use instability training extensively because of a lack of access to or desire to perform more intense ground-based exercises, such as squats. This is also acceptable, as long as the level of instability or program challenge progresses over time and is designed relative to the neuromuscular development (i.e., balance, coordination, and strength) of the participant. For example, the utility of performing a single leg squat exercise on an unstable surface is lost if the participant is unable to balance effectively or to complete the exercise properly. In that situation, it would be more appropriate to do a stable exercise, where the participant could complete the exercise safely and properly achieve the training benefits from completing the required repetitions at the desired intensity. In this respect, it is important to note that the core musculature is also a stabilizing muscle group and, therefore, specific training of the core muscles is better achieved through more endurance-oriented prescriptions, leaving the muscle building or strength and power training to other exercises and modes.

Summary points

- Core stability is provided by the activation of groups of muscles in combination with abdominal bracing.
- Instability training, through the use of unstable surfaces or devices, is beneficial in increasing core muscle activation, improving neuromuscular efficiency, and reducing the incidence of low back pain.
- Instability training can reduce movement force, power, and velocity and, therefore, may not be appropriate for use as the primary method of training in athletes.
- Isolation exercises for the core musculature are particularly well suited for high-volume training that emphasizes localized muscular endurance development.
- Instability training should comprise part of a well-balanced and well-rounded exercise program for the attainment of overall musculoskeletal health.

References

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