

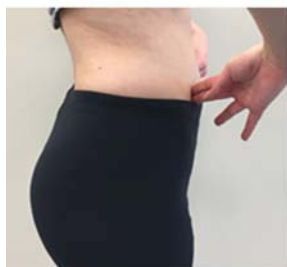
Abdominal Bracing for Minimizing Excessive Pelvic Motion During Running

Heather K. Vincent, PhD, FACSM and Kevin R. Vincent, MD, PhD, FACSM, FAAPMR

Low back pain (LBP) is reported by 14% of all runners and is more likely to occur in novice runners (1). Runners with LBP may be experiencing excessive anteroposterior tilt



Place the spine in a neutral position.



Produce a submaximal isometric contraction of the abdominal muscles (imagine the muscles squeezing inward, like the “rings of a tree”).



Press fingers into the abdominal muscles; muscles should resist depression by fingers.

Figure: Performing the AB.

motion of the pelvis in part which places mechanical stress on the spine. This excessive rocking motion may be partly due to quiescent or dysfunctional core muscles that are not stabilizing the pelvis and spine (2). An effective technique to induce activation of deep abdominal muscles is abdominal bracing (AB) (3). Abdominal bracing involves a submaximal isometric contraction of the muscles of the abdominal wall, (3) without visible movement from the spine, ribcage, or pelvis (4). This action causes symmetrical muscle activation (5,6) of transverse abdominis, external oblique, and internal oblique muscles. Abdominal bracing can preferentially activate internal oblique muscles, but also activate the other abdominal muscles and the erector spinae to reduce pelvic rocking and produce a supportive buttress against spine instability (4). The technique can be initiated during rehabilitation for acute flares and during maintenance run training to prevent LBP recurrence (Fig.).

References

1. Taunton J, Ryan MB, Clement DB, *et al*. A retrospective case-control analysis of 2002 running injuries. *Br. J. Sports Med.* 2002; 36:95–101.
2. Raabe ME, Chaudhari AMW. Biomechanical consequences of running with deep core muscle weakness. *J. Biomech.* 2018; 67:98–105.
3. Fredericson M, Moore T. Muscular balance, core stability, and injury prevention for middle and long distance runners. *Phys. Med. Rehabil. Clin. N. Am.* 2005; 16:669–89.
4. Maeo S, Takahashi T, Takai Y, Kanehisa H. Trunk muscle activities during abdominal bracing: comparison among muscles and exercises. *J. Sports Sci. Med.* 2013; 12:467–74.
5. Park SH, Song MY, Park HJ, *et al*. Effects of different types of contraction in abdominal bracing on the asymmetry of left and right abdominal muscles. *J. Phys. Ther. Sci.* 2014; 26:1843–5.
6. Aboufazeli M, Afshar-Mohajer N. Within-day and between-day reliability of thickness measurements of abdominal muscles using ultrasound during abdominal hollowing and bracing maneuvers. *J. Bodyw. Mov. Ther.* 2018; 22:122–8.

Department of Orthopaedics and Rehabilitation, University of Florida, Gainesville, FL

Address for correspondence: Heather K. Vincent, PhD, FACSM, University of Florida, Gainesville, FL; E-mail: vincehk@ortho.ufl.edu.

1537-890X/1704/111

Current Sports Medicine Reports

Copyright © 2018 by the American College of Sports Medicine