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Volume 37, 2015 - [Issue 7](#)

1,507 40

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Review

Effect of trunk-restraint training on function and compensatory trunk, shoulder and elbow patterns during post-stroke reach: a systematic review

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Pages 553-562 | Received 01 Dec 2013, Accepted 04 Jun 2014, Published online: 25 Jun 2014

Cite this article <https://doi.org/10.3109/09638288.2014.932450>



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Abstract

Purpose: The purpose of this systematic review was to determine the effect of trunk restraint (TR) training on post-stroke compensatory trunk movements during functional reach, and to identify functional gains of TR within the context of the International Classification of Functioning, Disability and Health (ICF). **Methods:** Six databases were searched prior to 20 February 2013. Randomized control trials (RCTs) comparing the effects of a post-stroke reaching intervention with and without TR in the adult post-stroke population were included in this review. Data related to study inclusion/exclusion criteria, methodology, study participants and between-group outcomes ($p < 0.05$) were extracted. All outcomes were categorized according to functional domains defined within the ICF. **Results:** Five RCTs met the inclusion criteria. TR groups demonstrated

significant between-group differences ($p < 0.05$) for decreased compensatory trunk displacement (4/5 RCTs), increased elbow extension (3/5 RCTs) and increased shoulder flexion (2/5 RCTs). All significant between-group differences fell within the Body Structure/Function domain of the ICF. Conclusions: Trunk restraint is a simple, cost-effective technique that may help to reduce compensatory trunk/shoulder/elbow movements in the post-stroke adult population. Synthesis of study outcomes also highlights applications of TR to clinical practice and areas for further research.

Implications for Rehabilitation

- The ability to use the shoulder and elbow to perform functional reach is a primary goal in post-stroke recovery; however, compensatory trunk movements are often used to achieve the reaching goal.
- Long-term use of compensatory strategies may contribute to secondary impairments, such as learned non-use, joint contractures and pain.
- Trunk restraint enables functional reach practice, while limiting compensatory strategies in the moderately to severely impaired stroke population.

[Compensatory movement](#) [constraint induced therapy](#) [kinematics](#) [postural control](#) [stroke](#)

Acknowledgements

The authors would like to acknowledge Shannon Roberts and Tapas Pain for their assistance with manuscript review and formatting.

Declaration of interest

The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

A review protocol was determined a priori by the review authors in terms of the type of study design, study population, types of interventions and outcome measures; however, a formal protocol was not registered with a registry service. The authors received no financial support for the research and/or authorship of this article.



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