Gstoettner M, Raschner C, Dirnberger E, and et al. Preoperative proprioceptive training in patients with total knee arthroplasty. The Knee 2011; 18:265-270.

Reviewer: Linda Metzger 2-10-15

Design: Randomized controlled trial

Objective: To evaluate the effects of a 6 week preoperative proprioceptive training on postoperative stance stability and function in activities of daily life in patients undergoing total knee arthroplasty (TKA).

Summary of Results:

- The results of this small trial demonstrated that preoperative proprioceptive training in patients undergoing total knee replacement is effective in improving standing balance.

Reasons not to cite as evidence:

- The designation of a primary outcome was not clear.
- Several outcomes (11) are reported: Three measures of balance using the Biodex Stability System, gait speed, WOMAC pain, stiffness, and function, two subscores for the Knee Society Score, and stairs up and down. Two follow-up measurements were taken, one after 6 weeks of training and one 6 weeks after TKA.
- Nine of the 11 outcomes measured were not significant and showed no difference between the groups. Only 2 outcomes were significant. Reporting on just the 2 positive outcomes is selective outcome reporting.
- Neither the WOMAC pain nor the function outcome measures showed significant differences between the 2 groups at the follow-up assessment. However, the study may have been underpowered to detect any differences. These results could be due solely to the small sample size.
- Sample size was small. The 2 groups included only 38 total participants with 3 patients in the training group that could not be reassessed 6 weeks after TKA. The study was more than likely underpowered to find an effect.
- The author failed to report if the assessors who performed the outcome measurements were blinded to the treatment groups and the study's hypothesis. This would leave the outcome measurements at a high risk of bias.
- Inclusion criteria were not clearly stated.
- The WOMAC function score was significantly different between the 2 groups at the baseline assessment making this comparison problematic.
- No attempt was made to evaluate adherence or monitor daily training performed at home. Non-compliance would tend to underestimate the size of the effect and could have contributed to the mainly non-significant results.
- The patients in the training group were assessed one additional time after 6 weeks of training compared to the control group. The additional practice and experience taking the test could have contributed to the significant outcome on the balance test. The measured effect could be the result of a practice effect.

- The author reported that 6 weeks of preoperative proprioceptive training was effective in improving standing balance in postoperative TKA patients. This result was based solely on statistical significance. The difference observed between the 2 groups in standing balance was statistically significant after TKA, but may not have been clinically significant, and this significant difference may have been due to the non-significant lower baseline stability scores (better stability) found in the training group.
- There were too many issues to make any evidence recommendations and the author's conclusions were also too weak for evidence. This may in fact be a good training program, but one can't determine that from this study.
- Based on only this one study, there is lack of supporting evidence from any other studies to make a definitive statement that preoperative proprioceptive training in patients undergoing total knee replacement is effective in improving standing balance.

Summary of Results:

- Inadequate for evidence of the effect of preoperative proprioceptive training in patients undergoing total knee replacement on standing balance.