Research evidence for the use of preoperative exercise in patients preparing for total hip or total knee arthroplasty

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CRD summary
The author concluded there was insufficient evidence to support use of preoperative exercise prior to total knee or hip arthroplasty. The author's conclusion reflected the evidence presented, but potential for language and publication biases, lack of reporting of review methods and a small number of included studies and small sample sizes made the reliability of the conclusion uncertain.

Authors' objectives
To assess the effects of preoperative exercise alone for patients preparing for total knee or hip arthroplasty.

Searching
MEDLINE, CINAHL, PEDro, The Cochrane Library, National Guideline Clearinghouse and Agency for Healthcare Research and Quality (AHRQ) were searched from 1998 to 2008 for English-language articles published in peer reviewed journals. Search terms were reported. Google scholar and TRIP databases were also searched. Bibliographies of retrieved papers were searched manually for additional material.

Study selection
Studies that included patients scheduled for total knee or hip arthroplasty and who received preoperative physical exercise/therapy alone with postoperative outcome measures were eligible for inclusion in the review. Eligible outcomes were muscle strength, mobility, pain and length of stay and/or discharge destination.

Included interventions varied from four- to six-week exercise programmes (12 to 18 total sessions); these included resistance training, step training, land and water exercises, cardiovascular strength training, flexibility and physiotherapy. Included outcomes were walking, WOMAC (function, pain stiffness), proprioception, limb stretches, knee strength, thigh circumference/muscle area, muscle strength, physical function, pain, functional reach test, up and go test and discharge location. Patients were scheduled for total knee arthroplasty in two studies and either total knee arthroplasty or total hip arthroplasty in one study.

The author did not state how many reviewers selected studies for inclusion.

Assessment of study quality
Validity was not formally assessed, but the author discussed methodological limitations in the text and used an adapted hierarchy of evidence rating system ranging from Level 1 (strong) to Level IV (low).

Data extraction
The author did not state how data were extracted for review.

Methods of synthesis
The results were combined by narrative synthesis.

Results of the review
Three studies were included in the review (n=130, range two to 108). One study was a randomised clinical trial (Level II evidence), one study was quasi-experimental (Level III) and one study was a case study (Level V).

Total Hip Arthroplasty (one RCT, n=108): Improvement or stabilisation in physical function and pain scores after six weeks of preoperative exercise were reported for patients who underwent total hip arthroplasty while scores for the control group worsened. There were no significant differences between groups at eight and 26 weeks postoperatively.
Total Knee Arthroplasty (three studies, n=130): Mixed effects were reported for preoperative exercise for patients who underwent total knee arthroplasty.

Authors’ conclusions
There was inconclusive evidence to recommend preoperative exercise prior to total knee or hip arthroplasty.

CRD commentary
The review addressed clear research questions with appropriate inclusion criteria. Several databases were searched. Only English-language publications were included, which introduced a risk of language bias. There was no apparent search for unpublished material, so relevant trials may have been missed and publication bias could not be ruled out. Although no results of a formal validity assessment were reported, methodological flaws in the study were discussed. No reported steps were taken throughout the review process to minimise errors and bias. The chosen method of synthesis appeared appropriate given the limited number of trials. The author's conclusion followed from the evidence presented, but given the potential for language and publication biases, lack of reporting of review methods and small number of included studies and small sample sizes, the reliability of the conclusions is uncertain.

Implications of the review for practice and research
Practice: The author stated that only a pragmatic recommendation for preoperative exercise prior to total hip or knee arthroplasty was supported

Research: The author stated that additional research with larger sample sizes, similar exercise programs and similar outcome measures (including cost and patient preferences) were required to make strong recommendations for preoperative exercise prior to total knee or hip arthroplasty

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.