Oesch P, Kool J, et al. Effectiveness of Exercise on Work Disability in Patients With Non-Acute Non-Specific Low Back Pain: Systematic Review and Meta-Analysis of Randomized Controlled Trials. J Rehabil Med 2010;42:193-205.

Design: Meta-analysis of randomized clinical trials

PICOS:

- **Patients**: Workers with a primary diagnosis of nonspecific low back pain for at least 4 weeks
- **Interventions**: Exercise alone or as part of a multidisciplinary treatment
- **Comparison intervention**: Usual care or another form of exercise
- **Outcomes**: Work disability defined as sick leave days, physician's judgment of work capability, or numbers of workers returning to full time work (RTW)
    - Most analyses for RTW were odds ratios (OR) for return to work: an OR significantly less than 1 meant that exercise was better than usual care (usual care had lower odds of RTW); an OR greater than 1 meant that usual care was better (had greater odds of RTW)
- **Studies**: Randomized controlled trials

Study search and selection:

- Databases included MEDLINE, PEDro, Cochrane Library, PsycINFO, through 2008
- References at the end of retrieved articles were searched for further trials
- Two authors independently applied the admission criteria for included studies and rated the risk of bias; a third researcher was consulted to resolve disagreements
- Study quality was based on 3 criteria relating to control of bias: selection bias, detection bias, and attrition bias
    - Selection bias was considered as controlled if the generation of the allocation sequence was based on computer-generated random numbers, drawing of lots, or other random process, and if the allocation sequence was concealed from patients and investigators who were enrolling patients
    - Detection bias was considered controlled if the assessment of outcomes was done by an observer who did not know the patient's treatment assignment
    - Attrition bias was controlled if the analysis were done by the intention-to-treat principle: if all patients were analyzed in their original groups, regardless of whether they had dropped out of the trial or crossed over to a different treatment group

Results:

- 838 articles were retrieved in the literature search; 87 were evaluated in detail, and 23 studies were selected for review

- Most of the article rejections were done either because the primary diagnosis was other than nonspecific low back pain (n=26) or because less than 90% of the patients were available for the job market (n=13)
- Of the 23 studies selected for review, 20 had data presented in a form that was suitable for meta-analysis
    - 17 studies had data comparing exercise with usual care
    - 11 studies had data comparing two types of exercise
    - Trials comparing 2 forms of exercise with usual care were treated as 2 trials, with the same sample size of usual care equally divided between the 2 exercise intervention groups
- Exercise dose was determined by the number of hours of supervised treatment sessions and their duration; interventions with at least 17 hours of supervised exercise were classed as high-dose, and interventions with less than 17 hours of supervised exercise as low dose
- Short-term follow-up was defined as the measurement closest to 4 weeks, intermediate terms as closest to 6 months, and long-term as closest to 12 months
- In the short term, there was not a statistically significant difference for work disability for 5 high-quality studies with 6 comparisons involving 1030 workers
    - Odds ratio (OR) was 0.80 in favor of exercise, but the 95% confidence interval (CI) was from 0.51 to 1.25
- In the intermediate term, 4 high-quality studies with 5 comparisons involving 971 workers showed no significant effect of exercise in reducing work disability
    - OR was 0.78, 95% CI, 0.45-1.34
- In the long term, 8 high-quality studies involving 1992 workers showed a significant effect of exercise in reducing work disability
    - OR was 0.66; 95% CI, 0.54-0.91
- Although the OR did not reach statistical significance, there was a trend toward greater RTW success when the exercise involved more supervision and had a behavioral treatment approach
- No one exercise intervention was shown to be superior to others
- High-dose exercise did not have a greater effect than low dose exercise

Authors' conclusions:

- The OR of 0.66 for RTW in the long term means that the odds of improvement in work disability are 34% lower if only usual care, rather than exercise, is given
- There was considerable heterogeneity in the estimate of the effect of exercise between studies, even though all but one of the studies were done in Europe, with similar social systems
- There was not an expected dose-response relationship between exercise and RTW, but this must be interpreted with caution, because of incomplete reporting and the lack of the amount of exercise actually done in the home-based exercise programs

Comments:

- Although the presentation of the meta-analysis is interpretable, the forest plots (Figure 2 and Figure 4) have only the odds ratios, and not the number of participants who did and did not have successful RTW, as is usual practice in the Cochrane Reviews
- The number of sick days was examined, but not used in meta-analysis, probably due to the skewed distribution of the number of sick days
- A decision was made not to look at the risk of performance bias (arising from unequal co-interventions between groups)
    - Although this is a common criterion for determining control of bias and study quality, it may have been somewhat arbitrary to define what constituted a co-intervention in the groups receiving usual care with a variety of different components
- Much of the heterogeneity could have arisen from the differing kinds of exercise; even though no one exercise could be shown to have a statistically significant advantage over any other, the effects of differing programs could be sufficient to introduce considerable heterogeneity in the meta-analysis

Assessment: Adequate for good evidence that exercise programs reduce long-term work disability and improve return to work