LITERATURE REVIEWS

**Summary and Perspective of Recent Literature**
*Lynda McClatchie, PT, Cert. MDT*

**Matsudaira K. Et al. (2015). Can standing back extension exercise improve or prevent low back pain in Japanese care workers? *Journal of Manual and Manipulative Therapy*; Published Online Jan 2015. DOI: http://dx.doi.org/10.1179/2042618614Y.0000000100**

**Objective:**
To determine if a standing back extension exercise (one stretch) can improve or prevent low back pain (LBP) in Japanese care workers.

**Design:**
A single-centre, non-randomized controlled study.

**Setting:**
One health care facility for the elderly: Numbu Kohoen, Japan.

**Patients:**
Japanese care workers at the facility who had direct patient care were assigned into one of two groups: workers on the first floor into the control group and workers on the second floor to the intervention group. No inclusion criteria beyond working in direct patient care on one of the two facility floors was mentioned. The subjects' exclusion criteria were:

- Difficulties in participating due to medical causes (spinal stenosis, rheumatoid arthritis, and ankylosing spondylitis) or other personal reasons

**Intervention:**
The subjects were assigned to either the "one stretch" standing extension group or the control group based on the facility floor on which they worked. All subjects in both groups received an exercise manual. The manual outlined how to properly do a standing back extension, and also provided some evidence-based information on self-management of LBP and risk factors (psychosocial factors and fear avoidance).

The "one stretch" intervention group received an exercise manual, a 30-minute seminar by an orthopedist that outlined the manual and the standing extension exercise, and performed the standing extension exercise together at their daily meeting in order to promote regular exercise.

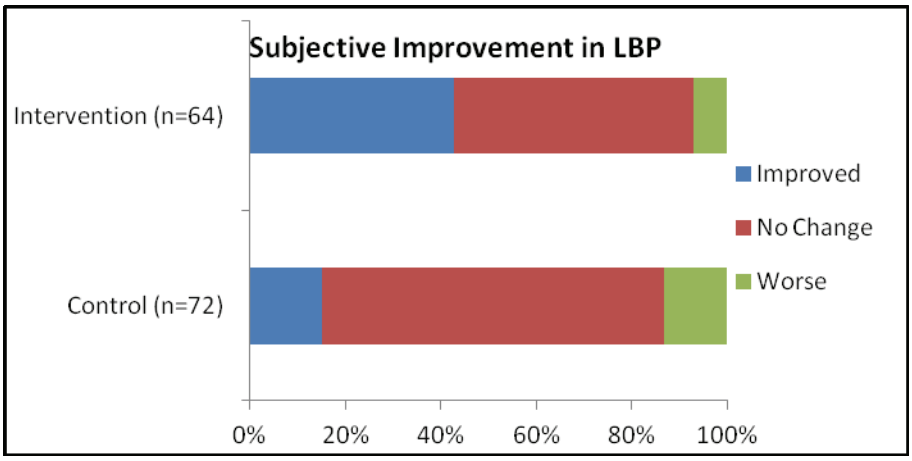
The control group received the same exercise manual, and the instructions were to "Practice active extension of the low back after lifting something heavy, keeping a forward flexion posture, or sitting still for an extended period." Each control subject was left on their own to complete the standing extension exercise as they saw fit.

**Main Outcome Measures:** Data was collected at baseline and after one year through a self-administered questionnaire. Outcome measures were:

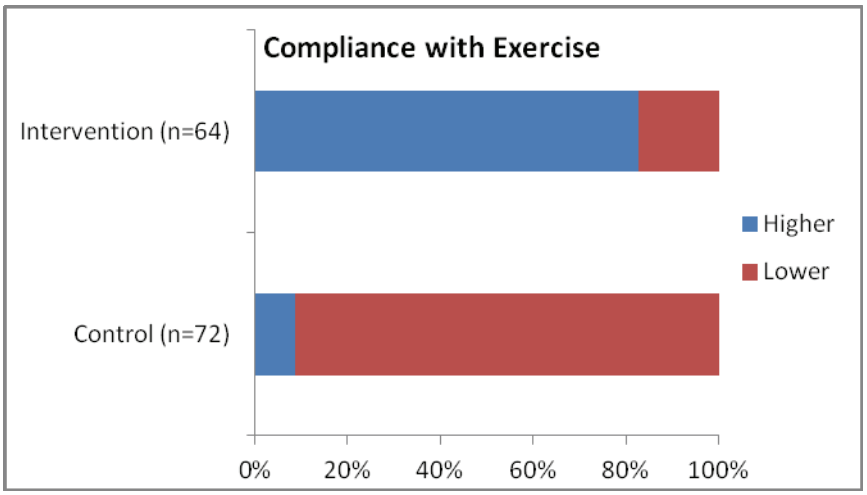
- The subjective improvement of LBP from baseline (improved, no change, worse)
- Compliance with the exercise (good/poor)

**Main Results:**
There was no statistically significant difference between the two groups at baseline.

| | One-stretch group *(n= 64)* | Control Group *(n=72)* | *P* value |
|---|---|---|---|
| Age (years) (+/- SD) | 36.8 ± 10.9 | 35.9 ± 10.9 | 0.39 |
| Gender (M/F) | 23/41 | 31/41 | 0.39 |
| Medical Consultation (+) | 7 | 5 | 0.41 |
| Severity of LBP in past month<br>No Pain | 21 | 25 | 0.47 |
| LBP without interfering | 40 | 40 | |
| LBP interfering | 3 | 7 | |
| SF-36 Score | 61.4 ± 19.9 | 61.3 ± 19.9 | 0.97 |




There was a statistically significant (p=0.003) number of subjects reporting “improvement” in LBP in the intervention group at the end of one year when compared with the control group.




There was a statistically significant (p=0.0001) number of subjects reporting “good” compliance in the intervention group at the end of one year when compared with the control group.

**Conclusions:**
The authors of this study concluded that standing back extension (one stretch) is effective to prevent care workers from developing and aggravating LBP. They hypothesized that performing standing extension exercise would improve LBP and decrease the number of workers requiring medical consultation or leaving work due to LBP.

**Comments/ Implications for the MDT Clinician:**
In this study, both the intervention "one stretch" group and the control group performed the standing extension movement, with the difference between the two groups being a 30-minute educational session given to the intervention group at the beginning of the study and the fact that the intervention group were encouraged to perform the exercise together at the daily group meeting. Since both groups performed the standing lumbar extension exercise, there is no comparison with a group who did not actively perform the exercise and so it can't be concluded that movement into extension can prevent lower back pain. It may be the intervention session received by the intervention group, or the fact they performed the exercises together that was helpful. Compliance was shown to be significantly better in the intervention group, but each person was asked to remember the frequency with which they performed the exercise for the follow-up questionnaire, which introduces recall bias.

The authors in this study do not use the same outcome measures at baseline as they do at one year. Initially, each subject rated the intensity of their lower back pain on Von Groff's scale, but the one-year follow-up questionnaire just asked if they were better or not. The study involves a small sample size and a single population of subjects, so these results cannot be generalized to the larger population.

With these shortcomings in mind, it is important, as MDT clinicians, that we don't overstate the results of this study. However, it is exciting to see the authors recognizing the importance of lumbar extension movement, and examining how the daily performance of extension can affect and prevent lower back pain. An opportunity for further research should include a control group who was not instructed on the standing extension exercise, but is perhaps only asked to move around regularly. It would also be interesting to see any effect with increasing the frequency and number of repetitions of standing lumbar extension, as we assume the intervention group in this study performed the exercise once per day, and there is no information on frequency in the control group. Another study should also vary the working populations (sedentary and active) involved.

http://dx.doi.org/10.1179/2042618614Y.0000000100

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**Summary and Perspective of Recent Literature**
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**Rosu OM, Ancuta C. (2014). McKenzie training in patients with early stages of ankylosing spondylitis: results of a 24-week controlled study. *European Journal of Physical and Rehabilitation Medicine*. June; 51(3) 261-8**

**Objective:**
To demonstrate the benefits of following a McKenzie-based training exercise programme compared to a standard protocol exercise programme for patients presenting with early stages of ankylosing spondylitis.

**Design:**
A randomised controlled study.

**Setting:**
The Rheumatology and Rehabilitation Department: Lasi, Romania

**Patients:**
Consecutive patients seen in the Rheumatology and Rehabilitation Department were randomly assigned into one of the two treatment groups.

The patients' inclusion criteria were:

- Early stages of axial ankylosing spondylitis with radiologic evidence of sacroilitis of at least grade 2 without spinal involvement
- Clinically stable disease
- No history of significant cardiovascular or respiratory conditions

No exclusion criteria are mentioned, but the authors' state in the article that two people were withdrawn due to lack of compliance to the exercise programmes.

**Intervention:**

The patients were randomly assigned into one of two groups; the McKenzie group and the Control group. The McKenzie group followed an exercise programme involving the following exercises for postural control, back stretching, respiratory re-education and pelvic stabilisation:

1. The use of a McKenzie lumbar roll with sitting.
2. Sustained flexion in supine lying using a lumbar roll in the lordosis and crossing legs over the head with knees slightly flexed. Hold for 10 seconds then relax for 10 seconds.
3. Sustained mid-range extension in lying on elbows for 10 seconds.
4. Deep breathing exercises in supine lying with lumbar roll in lordosis and arms in internal rotation.
5. Deep breathing exercises in supine lying with lumbar roll in lordosis and arms fully flexed above head.
6. Sustained side gliding in standing against wall, holding for 10 seconds.
7. Repeated side plank exercises.
8. Side lying exercise – but not clear in the description what this entails.
9. Supine lying with lumbar roll under lordosis and hands behind head. Lift trunk up off floor and hold for 10 seconds.

The Control group followed the following programme:

1. Postural training in standing, supine lying, and sitting positions.
2. Lumbar extension and flexion in four-point kneeling.
3. Deep breathing exercises in supine lying without lumbar roll in lordosis and arms in internal rotation.
4. Deep breathing exercises in supine lying without lumbar roll in lordosis and arms fully flexed above head.
5. Standing push-ups against corner of wall.
6. Bridging exercises in crook lying.
7. Truncal lateral flexion in sitting with hands behind neck.
8. Supine lying without lumbar roll under lordosis and hands behind head. Lift trunk up off floor and hold for 10 seconds.

For the first 12 weeks of the study, patients were supervised by a trained physiotherapist in the outpatient rheumatology department, under the supervision of their treating rheumatologist. For the second 12 week period, the patients performed the exercises at home unsupervised. The exercises were performed for one 50 minute session, three times per week.

To ensure compliance all patients were given a journal describing their exercises which they were asked to complete after each exercise session.

**Main Outcome Measures:**

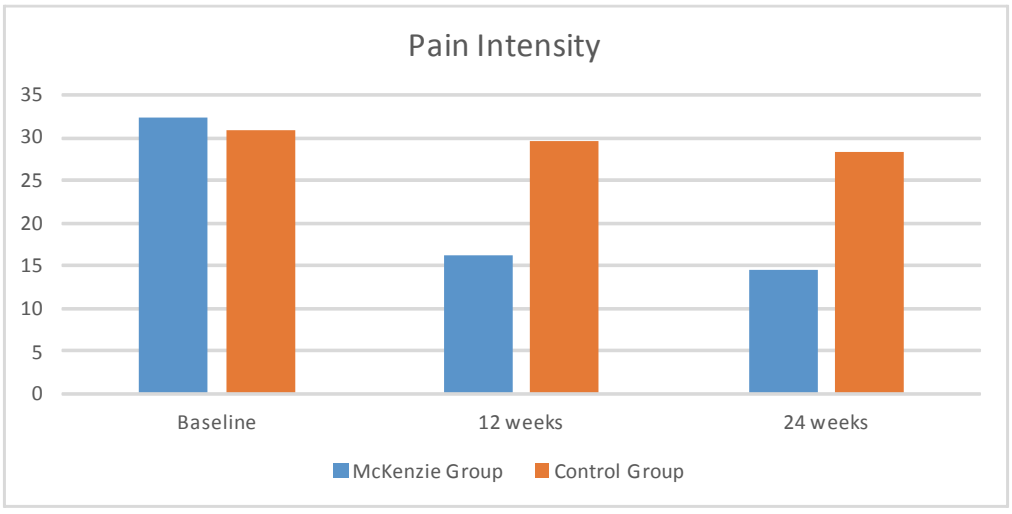
1. Pain intensity as measured on a visual analogue scale.
2. Lumbar spine mobility as measured by the modified Schober test and the finger-to-floor distance.

Secondary outcome measures were disease activity, function, metrology, and chest expansion.
All measurements were taken at baseline, 12 weeks, and 24 weeks.

**Main Results:**
At baseline there were no significant differences between the two groups in terms of demographics:

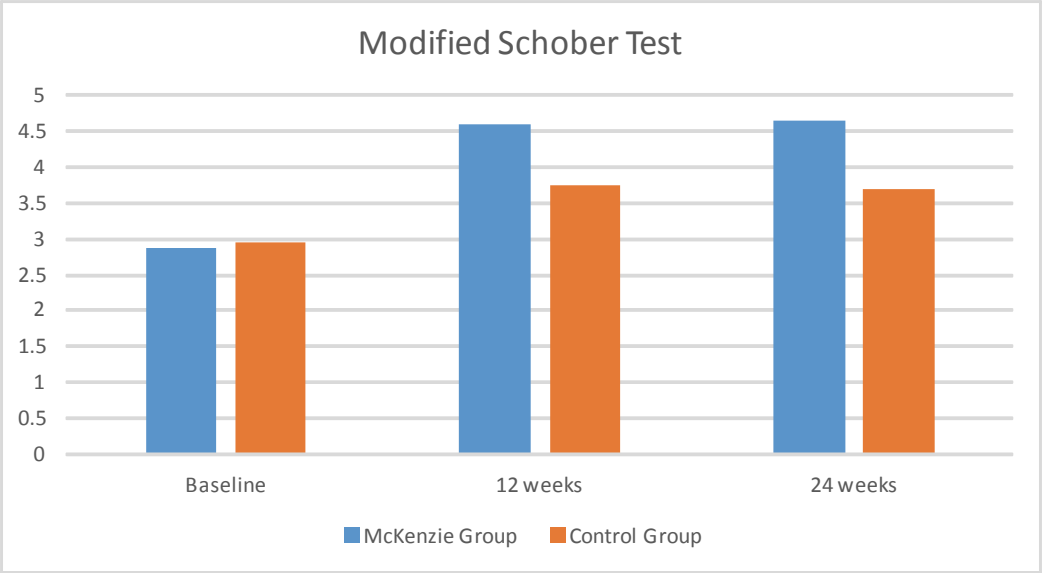
| | McKenzie Group (*n* = 26) | Control Group (*n* = 24) | *P* value |
|---|---|---|---|
| Age (years) (mean ± SD) | 25.12 ± 3.98 | 22.96 ± 3.65 | >0.05 |
| Gender (M/F) | 22/4 | 21/3 | >0.05 |
| Disease duration (Years) | 5.73 ± 3.11 | 4.21 ± 2.98 | >0.05 |

Changes in pain intensity:

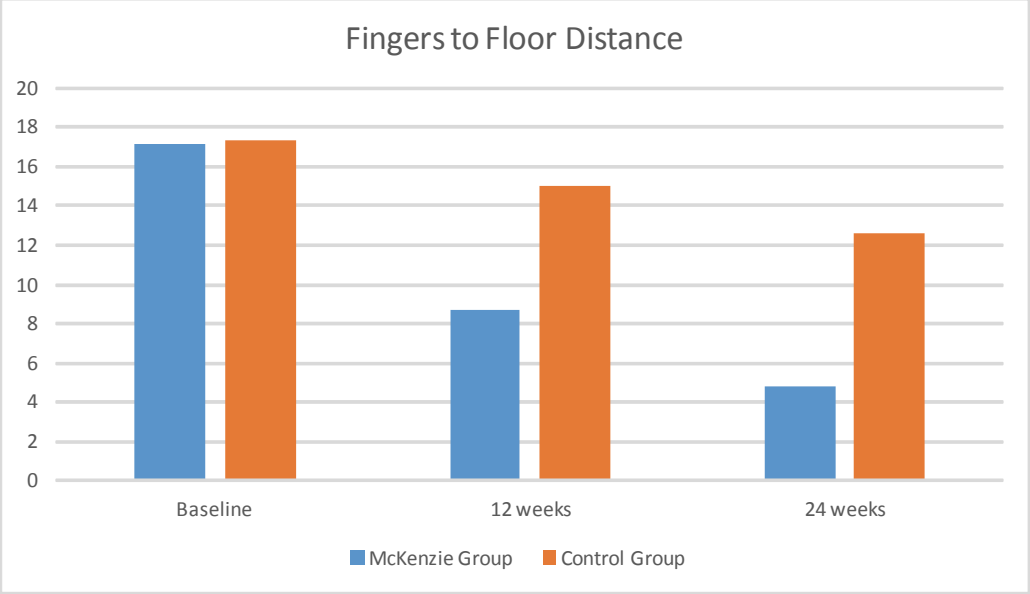



There was a statistically significant difference in the pain intensity between the two groups at both the 12 week and 24 week measurements with the *p* value being 0.001 in favour of the McKenzie group.

Changes in Mobility:




The differences between both groups for the modified Schober test were statistically significant for both the 12 weeks and 24 weeks measurements, having a *p* value of 0.001 both times.




Again, the differences between the two groups were statistically significant with a *p* value of 0.003 at 12 weeks and 0.001 at 24 weeks.

The secondary measurements of disease activity, function, metrology, and chest expansion also showed statistically significant improvements in favour of the McKenzie group with *p* values ranging from 0.001 to 0.003.

**Conclusions:**
The conclusions drawn by the authors of this study were that due to the improvements seen, a specific McKenzie exercise programme should be included in the standard care of early stage ankylosing spondylitis.

**Comments/Implications for the MDT Clinician:**
Although this article may initially seem exciting for MDT clinicians, there are several limitations we need to be wary of. The obvious limitations are the small number of subjects, with a total of only 50 patients completing the programme, and the fact there is no long term follow-up to determine if the differences remained relevant. The less obvious limitation when initially reading the article is the content of the

McKenzie group exercise programme. The authors' state that it is based on the McKenzie Method, yet the only direct link seems to be the use of a McKenzie lumbar roll in sitting, the sustained mid-range extension in lying exercise and side gliding in standing against the wall. To be a true reflection of the McKenzie Method a thorough assessment would need to have taken place for each patient and a specific exercise programme designed in accordance to the findings of the assessment, including repeated movement testing. We are not informed whether this occurred or not. A blanket approach of global exercises is never prescribed using MDT. Strengthening exercises do have a role to play with certain patients, but again they are only prescribed if indicated and on an individual basis.

We are also not informed of the number of repetitions the patients performed of each exercise, only that they were sustained for 10 seconds and had a 10 second relaxation time. One of the key differences between MDT and other protocols is the use of repeated movements – whether for derangements or dysfunctions, or for assisting in the healing process or repair and remodelling. Another key difference is the frequency of the exercise session for patients receiving MDT. Patients are encouraged to perform exercises five to six times throughout the day, every day, not three times per week as in this study.

Interestingly, the authors also state that the McKenzie Method assists with inflammatory pain. Chemical pain from inflammation is, in fact, one of the contraindications of MDT. The fact there was a statistically significant improvement in pain intensity within the McKenzie group suggests that the chemical pain was either under control with the NSADIs medication patients were on, or was not relevant at the time of exercising. Again, we are not informed how many of the patients were on NSAIDs, but are told that if they were on any at the beginning of the study they remained on them. It would have been interesting to discover how many of these patients presented with derangements as well as their ankylosing spondylitis diagnosis and therefore responded favourably to the postural correction component of the programme.

Another fact is that we are not informed of the level of McKenzie training any of the involved therapists had received, or whether their knowledge of 'McKenzie' was gained through self-learning. This could explain the lack of correlation between the study's 'McKenzie' group and what MDT actual entails - a thorough individualised assessment, a frequent exercise programme developed in accordance to the findings of the assessment process and then modified according to the ongoing mechanical and symptomatic response to the repeated movements.

Having said all that, it is still exciting to see a group of clinicians attempting to explore the effect of MDT on a group of patients diagnosed with ankylosing spondylitis. To be a true representative of MDT however, the McKenzie group would need to have had an individualised assessment and exercise programme and the protocols would have to more truly reflect the McKenzie Method of MDT. There is a great opportunity for further research to be done with this patient population, ensuring MDT is appropriately represented.

**http://www.ncbi.nlm.nih.gov/pubmed/25358635**