Advice to stay active or structured exercise in the management of sciatica: a systematic review.

Background
Sciatica is considered a symptom rather than a specific disease. It is believed to arise from a disorder related to the spinal nerve or nerve root and is characterized by specific clinical features, including radiating pain to the leg below the knee, into the foot and toes, occasionally accompanied by sensory and/or motor changes. Sciatica is a subgroup of low back pain (LBP) with a lifetime prevalence of 4-5%, small in comparison to the lifetime incidence of LBP, which approximates 80%. However, those with sciatica tend to have a poorer prognosis, with an increased risk of future work disability and use of health care resources, as patients express a high degree of hopelessness regarding their leg pain, when compared to their back pain. Nerve root compression, commonly caused by a herniated intervertebral disc, is regarded as the most frequent cause of sciatica, however lumbar stenosis, spondylolisthesis, tumors or cysts cannot be ruled out as possible causes. In addition, other conditions such as osteoarthritis of the hip can give symptoms that mimic sciatica. Knowledge on the clinical course of sciatica is limited, and although it seems to have a favorable natural resolution for most patients, 20%-30% continue to suffer pain for one year or longer.

Various treatment options are available for patients with sciatica, including staying physically active and bed rest, although passive treatments such as bed rest have been replaced with more active treatments. Conservative treatment for sciatica is often recommended in the first 6-8 weeks, aiming to reduce pain either through analgesics or various manual therapies including spinal manipulation and mobilisation, traction, acupuncture and physical therapy. However, previous systematic reviews have found either little evidence that any one type of conservative treatment was clearly superior to others or even to no treatment for patients with sciatica. Previous reviews have also shown that there is limited evidence to confidently recommend the use of analgesic medication, while the use of epidural corticosteroid injections only offers short term effects on pain and disability for sciatica.

Surgery is another treatment option for sciatica, but should be recommended if symptoms persist following a trial of conservative treatment. A recent meta-analysis found surgery to be superior to physical activity based interventions (exercise and/or advice to remain active) in reducing pain and
disability up to 5 years for sciatica. Whilst pooled effects of these interventions were considered too small to be clinically meaningful, evidence on treatment effect sizes for advice to stay active or prescribed/supervised exercise in the management of sciatica is lacking. Given the risks associated with surgical procedures and subsequent complications, non-surgical management either though advice to stay active or structured exercises may be an effective option for patients whose sciatica symptoms would normally qualifies them for surgery.

Currently, advice is considered ‘first in line’ for the treatment of acute LBP and is recommended in all international guidelines, yet it is under-utilized by general practitioners. Advice (verbal, written, audiovisual or electronic format) has shown benefits in both pain relief and functional status over bed rest for LBP, but no differences have been found regarding sciatica. Current guidelines suggest avoiding bed rest, favoring a gradual return to activity. Structured exercise prescription is considered ‘second in line’ for LBP care, with various guidelines not recommending a particular type of exercise as such, rather suggesting exercise should be intense and for chronic LBP only. Exercise is probably the most widely used form of conservative treatment worldwide and is likely to provide benefits beyond LBP, including arthritis, heart disease and respiratory illness. The success in exercise prescription appears to lies in health care provider supervision, individual programs and patient preferences.

A meta-analysis comparing exercise to advice found significant reductions by exercise in pain and disability in the short term for LBP, although the effect sizes were small, questioning its clinical relevance. Regarding sciatica, a recent network meta-analysis found no support for the effectiveness of advice or exercise therapy compared to an inactive control (placebo/sham therapy). To our knowledge, there has been no systematic review or meta-analysis specifically comparing advice to stay active or structured exercise in the management of sciatica.

**Aim**

The aim of this review is to evaluate the available evidence comparing advice to stay active or structured exercise in the management of sciatica.

**Searches**
Using a combination of key words for sciatica, MEDLINE, CINAHL, Embase and PEDro databases will be searched from the earliest records to July 15th, 2014 to identify randomized controlled trials comparing advice to stay active to structured exercise. Additionally, the reference list of the included studies will be checked, along with trial registries. There will be no language or geographic restrictions and personal contact will be made with authors of included articles, if additional data is required.

**Definition of Sciatica**

To be eligible, studies will require participants experiencing sciatica or a synonym for sciatica. The following sciatica synonyms will be considered: lumbosacral radicular syndrome, nerve root compromise, radiculopathy, nerve root pain and nerve root entrapment or irritation. In addition, trials with mixed groups of patients with low back pain will be eligible if it is possible to clearly define a subgroup with sciatica. Data only from these participants will be included in the analysis. Further patients who have spinal stenosis or spondylololithesis will also be considered eligible if they specifically experience sciatica. Studies with acute (less than 6 weeks), sub-acute (six to 12 weeks) and chronic sciatica (12 weeks or more) will be included. Trials will be considered eligible when reporting at least one of the following outcome measures: overall pain intensity (when not specified as leg or back pain), leg pain intensity, back pain intensity, functional and disability status.

**Definition of advice to stay active**

General advice to stay active, continue to engage in physical activity/activities of daily living. It also includes an explanation of patients pain, reassurance of favorable prognosis of their condition, instruction on correct lifting technique

**Definition of structured exercise**

Structured exercise includes any form of planned, structured and repetitive exercise prescribed or supervised by a health professional. Includes patient handouts of exercises.

**Type of studies selected / included and excluded**

Randomised controlled trials comparing advice to stay active to structured exercise in the management of sciatica will be included. Studies required participants to experience sciatica or a synonym for sciatica including lumbosacral radicular syndrome, nerve root compromise, radicular or nerve root pain, nerve
root entrapment or irritation. Further, patients who have spinal stenosis or spondylolithesis was also considered eligible if they specifically experience sciatica. Studies with acute (less than 6 weeks), sub-acute (six to 12 weeks) and chronic sciatica (12 weeks or more) were included.

Interventions were restricted to those who were given general advice to stay active, or educated on the benefits of continuing to engage in physical activity/activities of daily living. Also included was an explanation of the patient’s pain, reassurance of favorable prognosis of their condition and instruction on correct lifting technique. Medication use was not exclusion. Exercise included interventions (clinic or home based), that was planned, structured, and repetitive and prescribed by a health professional (including patient handouts of exercises). Trials were included if they reported endpoints such as pain and disability status and both were considered as primary outcomes. We excluded trials which only emphasized passive therapies such as spinal manipulation, traction or injection therapy. Patients who previously had spinal surgery, cauda equine syndrome or serious spinal pathologies such as cancer, fracture and infection were also excluded from this review.

**Participants / Population**

There will be no restriction to the source of patients.

**Data extraction / Quality assessment**

Two reviewers will independently assess trials’ quality, using the PEDro scale. Any disagreement will be solved by consensus. Methodological quality will not be an inclusion criterion.

Two independent reviewers will extract means (final scores or change score), standard deviations, and sample sizes from studies using a standardised data extraction form. When there is insufficient information in trial reports, authors will be contacted or data estimated using methods recommended in the Cochrane Handbook for Systematic Reviews of Interventions, i.e. if the mean is not reported, the median will be used; if standard deviations cannot be estimated, the standard deviation from the most similar study will be adopted.

The GRADE approach will be used to evaluate the overall quality of evidence and the strength of the recommendation. An adapted version of the criteria will be used, advocated by the Cochrane Back
Review Group. In randomised controlled trials, the quality of evidence will be downgraded by one level for each of 5 factors encountered:

- limitations in the design (>25% of participants from studies with low quality methods—PEDro score <7 points);
- inconsistency of results ($I^2$ squared statistic >75% or ≤75% of the participants report findings in the same direction);
- imprecision (total number of participants <400 for each outcome);
- publication bias (construct a funnel plot for ≥ 10 studies in a meta-analysis);
- indirectness (for an unspecific population)

Two reviewers will assess and judge publication bias and indirectness. Any single randomised studies (under 400 participants) will be considered inconsistent and imprecise (namely due to sparse data) and considered “low quality evidence.” If there are limitations in design, studies will be further downgraded to “very low quality evidence.”

The following (GRADE) will define the quality of evidence:

- High quality—further research is unlikely to change our confidence in the estimate of effect. There are no known or suspected reporting biases; all domains fulfilled
- Moderate quality—further research is likely to have an important impact on our confidence in the estimate of effect and might change the estimate; one of the domains was not fulfilled
- Low quality—further research is likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate; two of the domains were not fulfilled
- Very low quality—we are uncertain about the estimate; three of the domains were not fulfilled.

A GRADE profile will be completed for each pooled estimate and for single trials comparing advice to stay active and structured exercise.

Data Synthesis / Analysis
Outcome data will be extracted for:
- immediate term (two or fewer weeks after randomisation),
- short-term (more than two weeks but less than three months),
- intermediate term (more than three months but less than 12 months),
- Long-term (12 months or more) follow-up evaluations.

When multiple time points fall within the same category, the one closest to one week for the immediate term, eight weeks for the short term, six months for the intermediate term and 12 months for the long term will be used. Pain intensity and disability scores will be converted to a scale from 0 to 100. Should more than one outcome measure be used to assess intensity of pain, disability or work status, the outcome measure described as the primary outcome measure for the trial will be utilised. Descriptive statistics will be used to describe adverse events reported in each trial.

Trials considered clinically homogeneous will be grouped according to either advice to stay active or structured exercise for outcomes (pain, disability, etc), and outcome assessment time points (immediate term, short term, intermediate term, and long term). Pooled estimates will be obtained with the Comprehensive Meta-Analysis software, version 2.2.04 (Biostat, Englewood, NJ). A random effects model will calculate pooled effects. For calculation of effect size, leg pain and overall pain will be pooled together, as leg pain is usually worse than back pain. When trials are not sufficiently homogeneous, pooling of data via meta-analysis will still be performed, with a sensitivity analysis conducted to investigate possible sources of heterogeneity in effect size among included studies. However, a limited number of trials in the meta-analysis may prevent further investigation.

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EMBASE

1. ‘randomised controlled trial’ OR ‘randomized controlled trial’ OR ‘randomised’ OR ‘randomized’ OR ‘placebo’ OR ‘placebos’ OR ‘randomly’ OR ‘trial’ OR ‘groups’ OR ‘controlled clinical trial’

2. ‘sciatica’ OR ‘sciatics’ OR ‘ischialgia’ OR ‘disc herniation’ OR ‘disk herniation’ OR ‘disc prolapse’ OR ‘piriformis’ OR ‘radiculopathy’ OR ‘radicular’ OR ‘lumbosacral’ OR ‘intervertebral disc’ OR ‘intervertebral disk’ OR ‘paresthesia’

3. 1 and 2

4. ‘active care’ OR ‘physical therapy’ OR ‘physical therapy modality’ OR ‘active conservative treatment’ OR ‘exercise therapy’ OR ‘physical exercise’ OR ‘physical fitness’ OR ‘conditioning’ OR ‘motor control’ OR ‘strength’ OR ‘endurance’ OR ‘physical activity’ OR ‘stretching’ OR ‘range or motion’ OR ‘rehabilitation’ OR ‘stay active’ OR ‘advice to stay active’ OR ‘manual therapy’ OR ‘exercise’ OR ‘stability’

5. 3 and 4

6. ‘animal non human’

MEDLINE

1. exp sciatic neuropathy/ or sciatic neuropath$.mp. or sciatic pain$.mp. or sciatic hernia$.mp. or sciatica.mp. or Sciatica/ or sciatica/ or sciatic$.mp. or piriformis.mp. or intervertebral disk.mp. or herniated disk$.mp. or slipped disk.mp. or prolapsed disk.mp. or disk prolapse.mp. or disk hernia$.mp. or intervertebral disc displacement.mp or herniated disc$.mp or herniated disc$.mp or slipped disc.mp. or prolapsed disc$.mp. or disc prolapse.mp. or disc hernia.mp. or radicular syndrome.mp. or radiculopathy$.mp.

2. lumbosacral.mp. or Low Back Pain/ or lumbal.mp. or lumbar.mp.

3. 1 and 2

4. randomized controlled trial.mp. or controlled clinical trial.mp. or randomized controlled trials.mp or random allocation.mp. or double blind method.mp. or single blind method.mp. or clinical trial.mp. or clinical trials.mp. or placebo.mp. or placebo$.mp. or random$.mp. or research design.mp. or Comparative Study/ or evaluation studies.mp. or follow up studies.mp. or prospective studies.mp. or cross-over studies.mp. or control.mp. or prospective$.mp. or volunteer$.mp.

5. 3 and 4

6. active care.mp. or physical therapy.mp. or physical therapy modality.mp. or active conservative management.mp. or exercise therapy.mp. or exercise therapies.mp. or physical exercise.mp. or isometric.mp. or isometric exercise.mp. or aerobic exercise.mp. or anaerobic exercise.mp. or physical fitness.mp. or fitness.mp. or Movement/ or movement.mp. or conditioning.mp. or locomotor
activity.mp. or motor control.mp. or flexibility.mp. or stability.mp. or strength.mp. or strengthening.mp. or endurance.mp. or resistance training.mp. or physical activity.mp. or sport.mp. or muscle.mp. or manual therapy.mp. or static stretching.mp. or dynamic stretching.mp. or ballistic.mp. or range of motion.mp or rehabilitation.mp. or human activities.mp. or exercise.mp. or nerve mobilization.mp. or nerve mobilisation.mp. or McKenzie.mp. or (mechanical diagnosis and therapy).mp.

7. 5 and 6

8. animal/ not human.mp.

9. 7 not 8

CINAHL

1. sciatic neuropath* or sciatic pain* or sciatic hernia* or sciatica* sciatric* or ischial* or piriformis* intervertebral disk displac* or herniated disk or slipped disk* prolapsed disk* or disk prolap* or disk hernia* or intervertebral disc displac* or herniated disc* or slipped disc* or prolapsed disc* or disc prolap* or disc hernia* or radicular syndr* or radiculopathy* or radiculopath*

2. randomized controlled trial* or controlled clinical trial* or randomized controlled trials* or random allocation* or double blind method* or single blind method* or clinical trial* or clinical trials* or placebos* or placebo* or random* or research design* or comparative study* or evaluation studies* or follow up studies* or prospective studies* or crossover studies* or control* or prospective* or volunteer* or prospective studies* or placebos* or placebo effect* or crossover design* or clinical trials* or single blind studies* or placebo effect* or controlled clinical trial* or randomized controlled trials* or random allocation* or double blind studies* or placebo effect* or placebo* or random* or research design* or comparative study* or evaluation studies* or follow up studies* or prospective studies* or crossover studies* or control* or prospective* or volunteer* or randomized controlled trials* or random allocation* or double blind studies* or placebo effect* or placebo* or random* or research design* or comparative study* or evaluation studies* or follow up studies* or prospective studies* or crossover studies* or control* or prospective* or volunteer* or random sample* or random assignment* or Cochrane library*

3. 1 and 2

4. active care* or physical therapy* or physical therapy modality* or active conservative treatment* or exercise therapy* or exercise therapies* or physical exercise* or isometric* or isometric exercise* or aerobic exercise* or anaerobic exercise* or physical fitness* or fitness* or movement* or conditioning* or locomotor activity* or motor control* or flexibility* or stability* or strength* or strengthening* or endurance* or resistance training* or physical activity* or sport* or muscle* or manual therapy* or static stretching* or dynamic stretching* or ballistic*, range of motion* or rehabilitation* or human activities* or exercise* or nerve mobilization* or nerve mobilization* or McKenzie* or Mechanical diagnosis and therapy*

5. 3 and 4

6. (MH "Animals") not (MH "Humans")

7. 5 not 6

PEDRO
Sciat**ca**, advice to stay active**, exercise**

**References**


