



Yoga for low-back pain

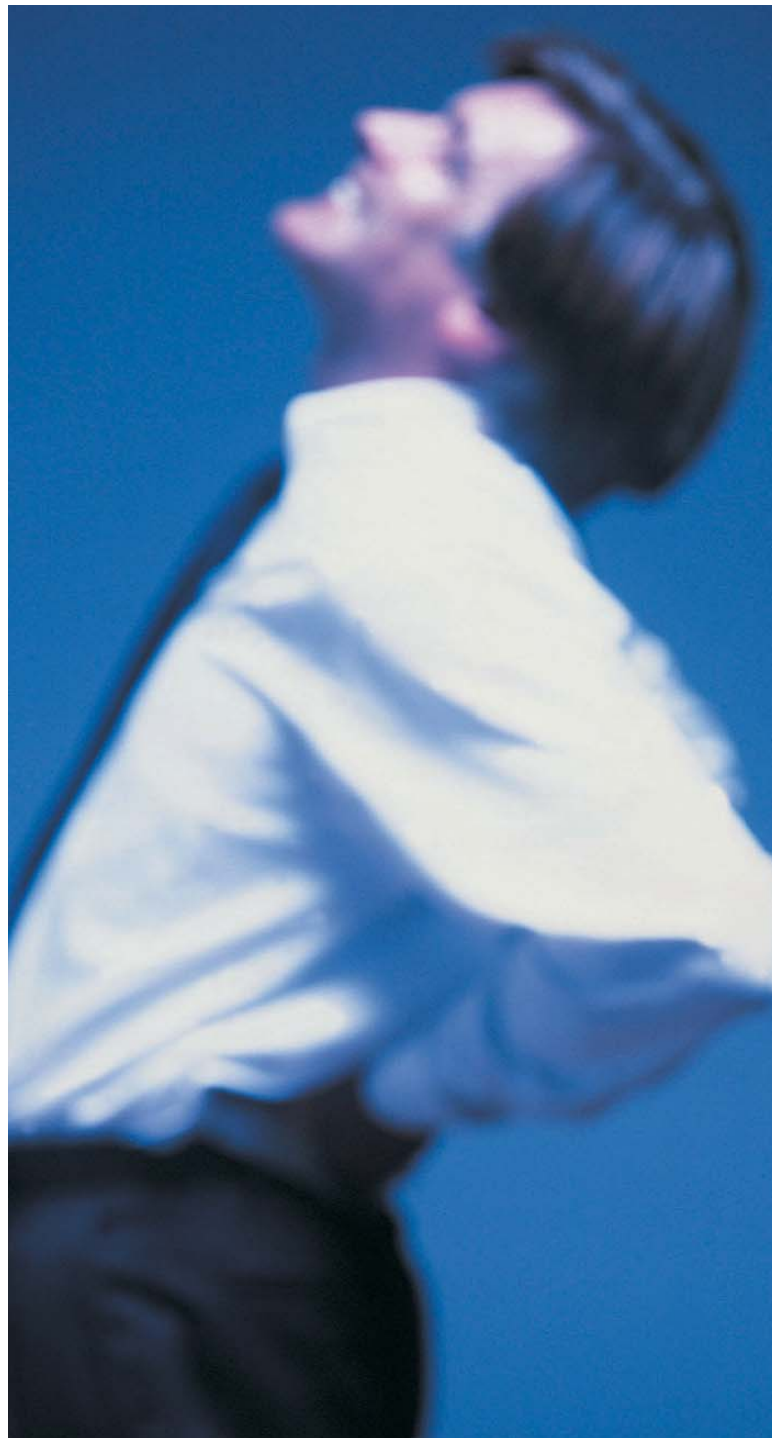
Simple yoga stretches and exercises can help alleviate the highest cause of sick leave, say physiotherapists Simon Borg-Olivier and Bianca Machliss.

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There are many possible causes of back pain. These include intervertebral disc bulge, degenerative disc disease, spinal muscle spasm, facet joint problems, nerve entrapment or impingement, inflammatory disease and congenital problems. There is no specific exercise-based cure for all back pain. However, intelligently applied exercise-based physiotherapy founded on the techniques of traditional *hatha yoga* can, in most cases, be of assistance in managing and improving back pain.

Back pain is often associated with other problems throughout the body, including shoulder stiffness, hip-flexor tightness, tight and weak gluteal muscles, hip-joint stiffness, lack of back extensor strength, tight hamstrings, hyper-extended knees, lack of aerobic fitness and pelvic floor weakness. With age and inappropriate physical activity, there is often a tendency for stiff parts of the vertebral column to become stiffer, while those that are more mobile tend to become weaker and more flexible. This uneven flexibility is often the source of back pain. The problem can be compounded by an exercise program that is not well planned nor applied, including yoga that is taught badly.

A stretching and strengthening program is therefore recommended to address the symptoms that accompany back pain. Strength and flexibility need to be trained simultaneously through a full range of joint motion. Joints that are very flexible and/or not very strong should only be stretched gently, or they risk becoming overstretched and injured. Similarly, joints that are stiff may become more stiff if the muscles around them are over-tensed or over-activated.



- **Stretching** should mainly be directed at the parts of the body that tend to be stiff or tight in people with lower-back pain, such as the hips, shoulders and middle spine.
- **Strengthening** should be directed at parts of the body that tend to be weaker and/or more flexible, such as the abdominal muscles (especially transversus abdominis), lower-back muscles (especially multifidus) and the major shoulder muscles such as the latissimus dorsi, which has fascial connections with the transversus abdominis and muscles of the lower limb.

Initially, the main aim in taking a person through the program is not to aggravate the existing condition. Then, as their whole body responds to exercise, the problem itself can slowly be addressed.

Stabilising the core

Core stabilisation is one of the most effective physiotherapy treatment techniques for low-back pain. In yoga, core stabilisation is a very ancient practice known as *mula bandha*. Throughout the body, *bandhas* are used in yoga to stabilise the major joint complexes while regulating circulation. A *bandha* is essentially the co-activation (simultaneous tensing) of antagonistic (opposing) muscles around a joint complex. *Mula bandha* involves the co-activation of antagonistic muscles (flexors and extensors) of the lower-back joint complex and/or the activation of the transversus abdominis¹⁻³ and the pelvic



floor muscles. Most exercise programs for the lower back should incorporate some form of *mula bandha*.

The two most important principles when treating back pain conservatively through exercise are to:

- 1 balance strength with flexibility, and
- 2 not perform any exercise that causes or exacerbates pain.

Safe stretching

The key to a safe stretching program is the use of ‘active stretching’ and ‘active-assisted stretching’⁴, which are useful ways of promoting simultaneous development of spinal strength and flexibility.

- **Active stretches** are movements that are initiated by

activation of an agonist muscle and cause a lengthening (stretching) and relaxation of the antagonist muscle.

- **Active-assisted stretches** are also initiated by activation of an agonist muscle to stretch and reciprocally relax the antagonist, but are assisted by other muscles, such as those in the arms or the legs.

A useful, simple series of active spinal stretches performed in a standing position that actively take the spine and trunk into their main movements are spinal traction (Figure 1), spinal flexion (Figure 2), spinal extension (Figure 3), spinal lateral flexion (Figure 4) and spinal axial rotation (Figure 5).

Hip stretches

Low-back pain is often made worse because of tightness in hip flexors, such as the psoas major, and the associated increase in lumbar lordosis. Simple hip-flexor stretches (Figures 6a, 6b)

are therefore recommended — provided they do not exacerbate pain — for most people with low-back pain. It is important in these stretches to emphasise posterior pelvic tilt. Stretch and relaxation of the hip flexors is enhanced if hip extensors such as gluteus maximus are activated during the stretch by ‘squeezing the buttocks’.

People with tight hip extensors — especially gluteal muscles and hamstrings — often over-flex their spines when bending forward and this can increase pain. Hence, people with low-back pain often benefit from intelligently applied hip-extensor

stretches, such as the standing hamstring stretch with a neutral or straight spine (Figures 7a, 7b), which can help a person to move more freely from the hips without straining the lower back, and which also strengthens the back extensors. Another useful hip-extensor stretch is the cross-legged forward bend (Figure 16), which can also alleviate some pain associated with sciatica by releasing the sciatic nerve from entrapment around the piriformis muscle.

Lunges and hamstring stretching are often challenging for people with physical limitations such as those imposed by low-back pain. Therefore a useful set of stretching exercises that incorporates active-assisted spinal flexion and extension, as well as hip flexion and extension, can be done in the supine position (Figures 10–14).

Prone spinal stretch

Another example of active stretching that may be incorporated in a program for relieving low-back pain is lying prone while lifting the chest and hands off the floor in order to activate spinal extensors such as the erector spinae and multifidus (Figure 9). This brings the spine into active extension and provides a gentle stretching of the spinal flexors (abdominal muscles).

An active-assisted stretch can also be incorporated in this position using the same muscles used in active stretching, but assisting the lift with the gentle use of the hands (Figure 8). The arms can also be used to pull the chest away from the hips in order to traction the spine in a prone position. These classical yoga postures form what is often referred to by physiotherapists as the McKenzie technique.⁵

In both the active and the active-assisted stretch described above, it is often useful to activate the abdominal muscles by attempting a posterior pelvic tilt (i.e. trying to press the pubic tail bone into the floor). This then generates a co-activation of opposing muscles around the lower back (*mula bandha*), which physiotherapists have shown to help stabilise the lower back and usually reduce low-back pain.¹⁻³

There is a tendency for stiff parts of the spine to become stiffer and more mobile parts to become weaker. This uneven flexibility is often the source of back pain

Modifications for severe back pain

Although there is ample evidence to suggest that a prone spinal extension helps in many cases of low-back pain —especially when there is lumbar disc bulging⁶ — there are many different ways to perform it, some of which may not be safe.

Not everyone with low-back pain is able to lie on their abdomen but for those who can, generally the safest approach is to lie prone with the abdominal muscles braced and the sitting bones pressing towards the floor (slight posterior pelvic tilt). Generally it is safer to attempt simple active-assisted spinal stretching first (Figure 8), with the aim of gently lengthening the front of the body without impinging the lower back. Initially, it is best not to let the lower back extend more than normally, and not to elicit or increase pain. This may be progressed to active extension by working towards lifting the hands off the floor. In case of spinal-muscles spasm, it may be better to leave the spinal muscles completely passive and simply use the hands to lift the chest off the floor to a passive spinal extension.

For those who cannot lie prone and extend the spine and the hips at the same time, spinal extension can be performed standing (Figure 3), on the floor in the supine posture (Figure 11) and approached while practising hip extension in the standing hip-flexor stretching exercises (Figures 6a, 6b).

Seated twisting exercises

Low-back pain is often relieved with gently applied active-assisted spinal twisting, performed sitting cross-legged or on a chair (Figure 15). This is most effective and safest to practise if the lumbar spine is held in its natural curvature (normal lumbar lordosis) while maintaining a firmness of the lower abdominal musculature.

Relaxation exercises

Learning how to relax is important. Spinal muscle spasm and general body tension resulting from the stress of daily life can be a contributing factor to back pain. Therefore it is useful to start and conclude an exercise program for back pain with a few minutes of total relaxation in a comfortable posture, such as lying supine with support under the knees and the head (Figure 17).

Caution – pain and yoga

These exercises should be used with caution and should be suitably modified for each individual so as to not exacerbate their problems. Pain is a relatively good indicator of how an exercise program is progressing. Although some pain may not be a problem, beginners and untrained practitioners of yoga should avoid moving so deeply into a posture that it elicits pain or causes an increase in resting pain. Pain should not be increased directly after the practice, other than a small amount of muscle tenderness on the day following a strong exercise session. When beginning an exercise program for back pain, it is prudent to make it quite gentle and then see how the body responds. With time and practice, the intensity of the program can then be gradually increased. ▀

References

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- 4 Alter MJ. Science of Flexibility. Lower Mitcham, SA: Human Kinetics, 1996.
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GENERAL PRECAUTIONS AND INSTRUCTIONS

This synergy-style yoga program is designed for people with non-serious low-back pain. It may not be suitable for people whose pain is easily inflamed after any exercise. The program is not designed to be practised during pregnancy or in cases of cancer. Move gently and carefully into each exercise and modify them according to your limitations. Keep the abdominal muscles gently tensed while you hold each posture for about 10–30 seconds.

Active standing spine movements

Keep the lower abdominal muscles gently tensed throughout these exercises. For each exercise, take one gentle breath in, then exhale fully and tighten the perineum, lower abdomen and the 'underarm muscles'



1: Spinal stretch

Interlock fingers in front of body and push hands away. Take arms and shoulders forward and up to lengthen spine and trunk. Keep lower ribs moving inwards towards the spine and move tail bone slightly down and forward to prevent back arching

2: Spinal forward bend

Bend knees 20–90°. Interlock fingers with palms facing outwards and push hands outwards. Take arms and shoulders forward and down to bend spine and trunk forward

3: Spinal backward bend

Bend knees 20–90°. Lean slightly forwards to activate back muscles, interlock fingers behind back and push hands away. Take arms and shoulders back and down to bend spine and trunk back. Move tail bone slightly down so lower back is not over-extended

4: Spinal sideways bend

From spinal stretch, move left ribs upwards and move hips carefully left to stretch the left side of body. Exhale fully, then push hips to the right to return to spinal stretch. Repeat on right side

5: Spinal twist

From spinal stretch, rotate body clockwise. Keep right ear slightly lifted from right shoulder and chin slightly lowered. Move right hip slightly forward. Do not arch back or bend sideways. Exhale fully, return to spinal stretch. Repeat on left side

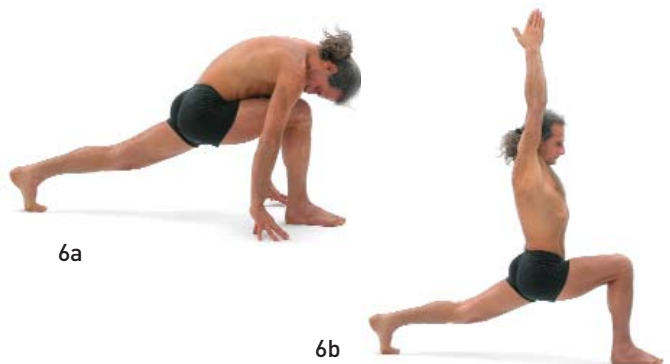
Standing lunges for hips

6a: Lunging front-groin stretch

Not for very stiff person — see 6b. Stand with big toes touching and heels slightly apart. Bend knees slightly and bend forward to bring fingers next to heels. Step left leg back about a metre to a lunge position. Gently tense buttock muscles. Repeat with right leg

6b: Standing lunging front-groin stretch

May be easier for stiff person if front is not bent far and hands are supported by wall or table in front of body. From 6a position, stretch arms and trunk upwards. Keep left heel lifted high and tuck tail bone down and forward. Gently tense buttock muscles. Repeat with right leg



Hamstring stretches

7a and 7b: Standing hamstring stretch

Stand with big toes touching and heels slightly apart. Step the left leg back about a metre. Place hands on hips. Turn left foot out 45° and right foot in 5°. Keep hips level, spine and legs straight. Move trunk slightly forward (7a) or up to halfway to the floor (7b) to stretch hamstrings and activate back muscles. Press the right sitting bone towards right foot as if trying to 'stretch' floor with feet. Support hands on wall or table in front if necessary

Yogic stretches for low-back pain

Prone spine stretches

8: Simple locust pose

Lie on abdomen, if not painful. Gently lift upper back away from floor. Use hands for support. Press sitting bones into floor and firm abdomen. Tighten the armpit muscles and gently pull chest forward with the hands



9: Active cobra pose

Press down sitting bones into floor. Draw the abdomen away from the floor. Tighten armpit muscles



10



11



12



13



Supine postures

10: Spine and hip flexion

Hug both knees to the chest, then lift sitting bones and perhaps head (carefully) from floor

11: Spine and hip stretch, hip flexion

Hug right knee to chest with head and sitting bones pressing into floor, as if trying to lift centre of spine from floor. Repeat with left leg

12: Spine and hip flexion, hip stretch

Hug right knee to chest, then lift sitting bones and perhaps head (carefully) from floor. Repeat with left leg

13: Spine stretch and hip flexion

Hug both knees to chest with head and sitting bones pressing into the floor as if trying to lift centre of spine from floor

14: Bridge pose

Lie on back. Bend knees and have feet hip-width apart, with knees above heels. Gently tense abdominal and buttock muscles. Press feet down and lift sitting bones up to stretch front of body



Seated postures

15: Seated twist

Sit cross-legged or on a stool. Firm abdomen and press feet into floor. Twist body to right, put left hand on right knee and twist further but turn head left. Repeat on opposite side, turning trunk left and head right

15



16: Seated forward bend

Sit cross-legged or on a stool. Firm abdomen and press feet into floor. Bend body forward over thighs and gently stretch forward

16



Relaxation

17: Supine supported relaxation

Supine relaxation with support under knees and neck as needed

17

