A Simple and Effective Approach to Building and Maintaining a Healthy Back

Presented by Workfit—a FITWELL program
Department of Recreational Sports, UC Berkeley

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Introduction

Over the course of our lives, nearly 4 out of 5 adults will experience serious back pain. Fortunately, much of our back pain is preventable and learning about how the back works is the first step toward developing and maintaining a healthy back. Once you understand how your back works, and what can go wrong, you're ready to start taking care of your back. By a) practicing proper posture or "neutral spine" when you sit, stand, lift, recline and move; b) including aerobic exercise into your daily regimen; and c) exercising and stretching muscles that support your back, you can prevent the most common causes of backaches. The result is freedom from back pain and a stronger, healthier back.

What is a healthy back?

The back (or spinal column) is not a stiff rod: it is composed of 24 moveable bones called vertebrae that are designed as curvatures to give a spring-like action. These vertebrae and discs are supported by ligaments and muscles that keep the back properly aligned in three balanced curves.

A healthy back is a balanced back—when your cervical (neck), thoracic (chest) and lumbar (lower back) curves are all properly aligned and work together to support your weight and provide dynamic movement. You know your back is aligned properly when your ears, shoulders and hips are "stacked" in a straight line. A healthy back is also protected and supported by flexible "elastic" discs and well-conditioned muscles. When any of these parts becomes diseased, injured or unconditioned, back problems and pain are almost certain to follow.

An aching back

A number of physical conditions, such as abnormal curvature of the spine (scoliosis), arthritis (stiffening), and herniated (ruptured) disks, can cause back pain. But the majority of backaches are due to poor posture and weak supporting muscles. Improper posture places excess stress on the spinal column. Over time, poor posture can lead to sudden or recurrent back pain. Weak muscles contribute to, and are often responsible for, poor posture since they cannot adequately support the spinal column.

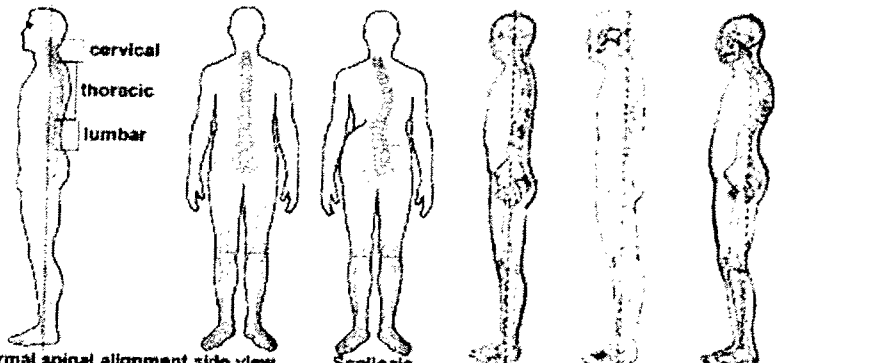
Posture for a Healthy Back

What is good posture?

Posture is the position in which you hold your body upright against gravity while standing, sitting or lying down. Good posture involves training your body to stand, walk, sit and lie in positions where the least strain is placed on supporting muscles and ligaments during movement or weight-bearing activities.

Understanding the importance of neutral spine

Managing and preventing back pain begin by understanding the neutral spine position. Three natural curves are present in a healthy spine. The neck, or the cervical spine, curves slightly inward or forward. The mid back, or the thoracic spine, is curved outward or backward. The low back, or the lumbar spine, curves inward or forward again. The neutral alignment is important in helping to cushion the spine from too much stress and strain. Learning how to maintain a neutral spine position also helps you move safely during activities like sitting, walking, and lifting.



Normal spinal alignment side view and front view. The spine should have three normal curves: cervical, thoracic and lumbar.

Scoliosis (sideways curvature of the thoracic spine)

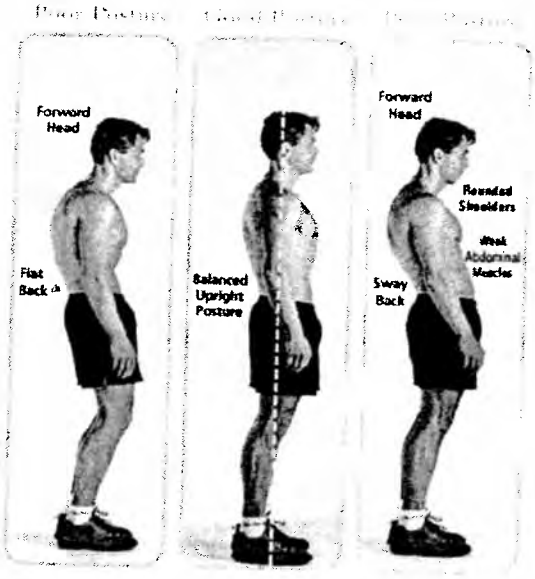
Sway-back posture

Flat-back posture

Kyphosis lordosis posture (curvature of the thoracic spine)

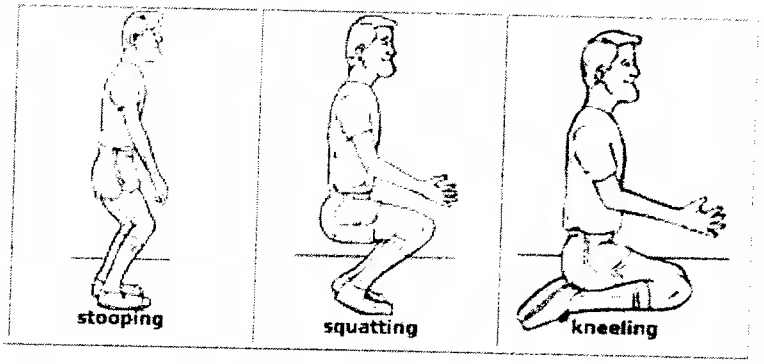
Correct standing position

1. Hold your head up straight with your chin in. Do not tilt your head forward, backward or sideways.
2. Make sure your earlobes are in line with the middle of your shoulders.
3. Keep your shoulder blades back.
4. Keep your chest forward and lifted.
5. Keep your knees lengthened.
6. Stretch the top of your head toward the ceiling.
7. Draw your belly button in toward your spine. Do not tilt your pelvis forward or backward.

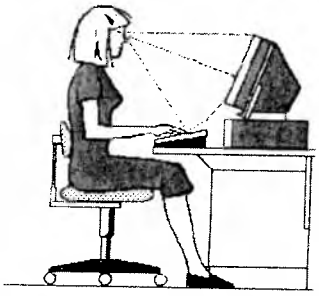


Correct positions for stooping, squatting and kneeling

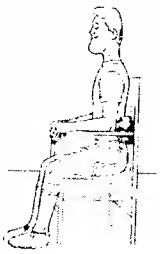
Decide which position to use. Kneel when you have to go down as far as a squat but need to stay that way for awhile. For each of these positions, face the object, keep your feet apart, tighten your abdominal muscles and lower yourself using your legs.



Correct sitting position



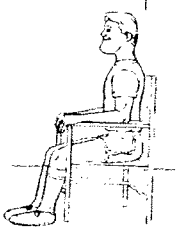
1. Sit up with your back straight and your shoulders back. Your buttocks should touch the back of your chair.



2. All three normal back curves should be present. A small, rolled-up towel or a lumbar roll can be used to help maintain the normal curves in your back.

Here's how to find a good sitting position *when you're <u>not</u> using a back support or lumbar roll:*

--Sit at the end of your chair and slouch completely.
--Draw yourself up and accentuate the curve of your back as far as possible. Hold for a few seconds.
--Release the position slightly (about 10 degrees). This is a good sitting posture.



3. Distribute your body weight evenly on both hips.

4. Bend your knees at a right angle. Keep your knees even with or slightly higher than your hips (use a foot rest or stool if necessary). Your legs should not be crossed.

5. Keep your feet flat on the floor.

6. Try to avoid sitting in the same position for more than 30 minutes.

7. At work, adjust your chair height and work station so you can sit up close to your work and tilt your computer screen up at you. Rest your elbows and arms on your chair or desk, keeping your shoulders relaxed.

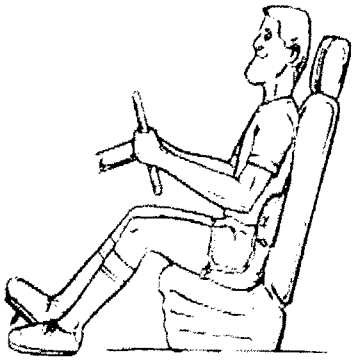
8. When sitting in a chair that rolls and pivots, don't twist at the waist while sitting. Instead, turn your whole body.

9. When standing up from the sitting position, move to the front of the seat of your chair. Stand up by straightening your legs. Avoid bending forward at your waist. Immediately stretch your back by doing 10 standing backbends.

It is ok to assume other sitting positions for short periods of time, but most of your sitting time should be spent as described above so there is minimal stress on your spine.

Correct driving position

- Use a back support (lumbar roll) at the curve of your back. Your knees should be at the same level or higher than your hips.
- Move the seat close to the steering wheel to support the curve of your back. The seat should be close enough to allow your knees to bend and your feet to reach the pedals.



Correct lifting position

1. If you must lift objects, do not try to lift objects that are awkward or are heavier than 30 pounds.

2. Before you lift a heavy object, make sure you have firm footing.

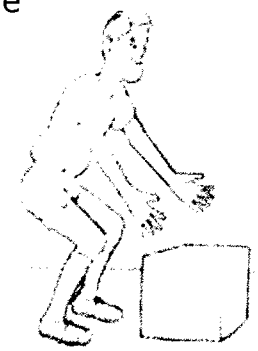
3. To pick up an object that is lower than the level of your waist, keep your back straight and bend at your knees and hips. ***Do not bend forward at the waist with your knees straight.***

incorrect lifting position

4. Stand with a wide stance close to the object you are trying to pick up and keep your feet firm on the ground. Tighten your abdominal muscles, bend your knees, and lift the object using your legs. Straighten your knees in a steady motion. Don't jerk the object up to your body.

5. Stand completely upright without twisting. Always move your feet forward when lifting an object.

6. If you are lifting an object from a table, slide it to the edge to the table so that you can hold it close to your body. Bend your knees so that you are close to the object. Use your legs to lift the object and come to a standing position.



correct lifting position

7. Avoid lifting heavy objects above waist level.

8. Hold packages close to your body with your arms bent. Keep your abdominal muscles tight. Take small steps and go slowly.

9. To lower the object, place your feet as you did to lift, tighten abdominal muscles and bend your hips and knees.

What is the best position for sleeping and lying down?

No matter what position you lie in, the pillow should be under your head, but not your shoulders, and should be a thickness that allows your ***head to be in a neutral position.*** Healthy sleeping aligns your head with your spine, taking pressure off your spinal joints, and allowing your neck muscles to relax completely.

- When on your back, try to sleep in a position which helps you ***maintain the natural curve in your back*** (such as on your back with a pillow under your knees or a lumbar roll under your lower back; or on your side with your knees slightly bent). Do not sleep on your side with your knees drawn up too close to your chest.

- Try using a back support (lumbar support) at night to make you more comfortable. A rolled sheet or towel tied around your waist may be helpful.

- When standing up from a sleeping position, turn on your side, draw up both knees and swing your legs on the side of the bed. Sit up by pushing yourself up with your hands. Avoid bending forward at your waist.

Exercises for Building and Maintaining a Healthy Back

Once you understand how the back works, you can begin focusing on exercises that will improve the overall health of your back. These changes will focus on:

- Posture
- Strength
- Flexibility
- Coordination
- Aerobic Conditioning

A Cautionary Note About Pain

Do not ignore pain. If you feel increased or sudden, sharp back pain or pain spreading to the legs from the lower back, do not continue the activity. If you continue to perform the activity while you are in pain, you may cause unnecessary stress or damage to your joints. It is important to learn to "read" your body and know when you need to stop or modify an activity that is straining your back versus when the pain is associated with repeated, normal muscle contraction or fatigue. *Always check with a doctor before beginning any type of exercise regime that is targeted an area of former or current injury.*

Posture: training movement between the pelvis and low back

Learning how to find and hold the neutral position of the spine is the basis for safe and healthy posture. Remember that the position of the pelvis determines the curve in the low back. Forward rotation increases the curve.

Backward rotation straightens the curve. By practicing these exercises, you will become comfortable using the neutral spine position in daily activities.

Before you begin, find neutral spine. Neutral Spine is the natural position of the spine when all body parts are in good alignment. Knowing neutral spine is crucial for doing any back exercise properly.

Here's how you find neutral spine:

1. Lie on your back with your knees bent and your feet flat on the floor. Make sure that your legs are parallel with heels, knees and hips all in one line. Your toes should be pointing directly away from your hips, not out to the sides. Let your arms rest at your sides.
2. Relax your body, your neck and your jaw. Make sure that your back is spreading against the floor. Your shoulders are relaxed away from your ears and your rib cage is dropped with the lower ribs released to the floor as well.
3. Breathe deeply and allow your breath to move into the back of your rib cage and let it fill out sideways rather than heaving the chest upward with the breath.

4. Now imagine that there is a cup of water sitting on your lower abdomen just a couple of inches down from your bellybutton. You don't want this water to spill, so keep this area very flat. You can make this area flat by allowing your abdominal muscles to drop in toward your spine. When you do this your pelvis remains neutral and does not tip forward or back with the movement of your abdominals.
5. You are now relaxed and very well lined up on the floor, with your abdominals engaged and breath deep and full. There will be a slight curve away from the floor in your lower back if you are in neutral spine position. This is the natural curve of the lumbar spine. Your lower spine is not pressed into the floor. That would be a pelvic tilt.
6. Take a minute or two and feel this position. It is easy and it is a very good reference point. Your body is relaxed yet engaged. Your breath is full through your back and not overly activating your chest. Your neck is relaxed and your rib cage is resting on the floor. Most importantly, your abdominals are engaged and pulled in yet your pelvis is not tipping back or forward. There is a slight natural curve of the lower spine away from the floor. <u>This is neutral spine.</u> Congratulations!

Stretching/flexibility exercises: allows for greater range of motion and normal movement around the spine and pelvis

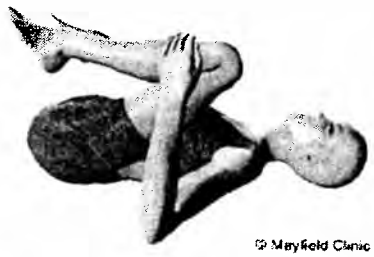
Exercises that increase flexibility also reduce pain, making it easier to keep the spine in the neutral position. Tight muscles cause imbalances in spinal movements. This can make injury more likely. Flexibility exercises for the trunk and lower limbs are helpful in establishing safe movement. A slow progression of stretching exercises can increase flexibility in these structures and reduce the chance of re-injury.

Any form of inactivity, especially if an injured back is involved, is usually associated with some progressive stiffness. Therefore, it is necessary to push the range of motion as far as can be tolerated (in a controlled manner). Patients with chronic pain may find it takes weeks or months of stretching to mobilize the spine and soft tissues, but will find that the increase in motion provides meaningful and sustained relief of their back pain.

Stretching exercise should focus on achieving flexibility and elasticity in the disc, muscles, ligaments, and tendons. Additionally, it is important to activate and strengthen muscles not directly involved with the injured area, such as the arms and legs. For example, hamstring and quadricep tightness limits motion in the pelvis and can place it in a position that increases stress across the low back, so hamstring and quadricep stretching is an important part of alleviating low back pain.

Flexibility allows you to move your arms and legs through their full range of motion. Stretching will help improve your flexibility. Adequate flexibility of tissues around the spine and pelvis allows full, normal spinal movement, prevents abnormal force on the joints and decreases the possibility of injury. Stretching also prepares muscles for activity; stretching should be done before and after each vigorous workout to prevent muscle strain and soreness and to help avoid injuries. When performing flexibility exercises, stretch as far as you can and hold the stretch (10-30 seconds). Each stretching exercise should be performed slowly, with no sudden jerking or bouncing. Bouncing can injure or strain a muscle or joint. Here are some good stretching exercises:

Reclined Hamstring Stretch: Lying down with knees bent, raise one leg, and supporting the back of thigh with your hands, attempt to straighten the knee until a comfortable stretch is felt in back of the thigh. Hold for 20-30 seconds, and repeat 2-3 times. Repeat with other leg. You can use the stability ball to assist with this stretch.



Double Knee to Chest Stretch: Lie on the floor with your back relaxed and straight. Pull both knees toward your chest until you feel a stretch in your lower back, do not bounce. Hold for 5 seconds. Repeat 5 times. You can do one leg at a time as well.

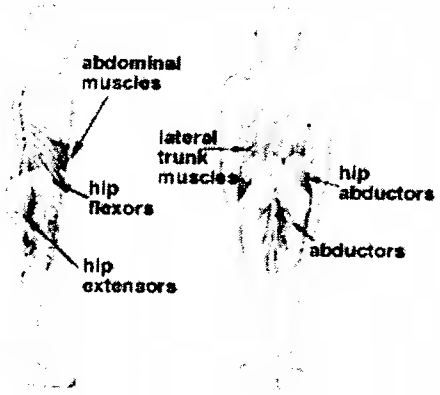
Standing Backward Bend: Stand straight with your hands on your waist. Bend backward, arching your back as far as you comfortably can while keeping your balance. Hold for 5 seconds. Repeat 5 times.

Quadriceps Stretch: Resting one hand on a stable object for balance, bend one leg, bringing your foot up behind your thigh, as shown. Grab the top of your foot and pull the foot toward your buttock until a stretch is felt in front of the thigh. Hold for 20-30 seconds. Repeat 2-3 times for each leg.

Strengthening exercises: preventing future back problems

The next stage of exercise focuses on the strength of the muscles that support the spine. These muscles help bring the spine into the neutral position and keep it there. Trained abdominal, back, and hip muscles assist in forming a natural corset. Strength training is simple to do at home and does not require any expensive equipment.

While pain relief is often achieved with stretching, future episodes of back pain may be less likely to occur with back strengthening. An episode of back pain that lasts for more than two weeks should be treated with proper strengthening exercise to prevent a recurring cycle of pain and weakness.



Strengthening exercises help increase muscle tone and improve the quality of muscles. Muscle strength and endurance provide energy and a feeling of wellness to help you perform daily, routine activities. Adequate strength of abdominal and back muscles helps stabilize the spine, allowing proper spinal movement and making it easier to maintain correct posture.

Here are some good strengthening exercises for the back:

Curl Ups-Upper Abdominal: While lying down with arms at your sides and knees bent, tilt your pelvis to flatten your back. Raise your shoulders and head until your shoulder blades clear the floor. Hold for 5-10 seconds, and repeat 10 times.

Oblique Trunk Raises: Lie on the floor with your back in neutral. Raise your head and bring shoulder toward opposite hip, reaching with your hands, as shown. Hold for 5 seconds. Repeat 10 times, and then switch to the other side and repeat 10 times.

Prone Trunk Raises: Lie face down with arms beside your body. Tighten your buttocks and lift your head and shoulders straight up from the floor as high as you can comfortably go. Hold for 5-10 seconds. Repeat 10 times.

Prone Alternate Arm/Leg Lift: Lie on the floor, face down with a towel roll under your forehead, stretch arms outward over your head. Place a pillow under your pelvis and abdomen. Keep your right knee straight, and lift your right leg and left arm 1-2 inches above the floor, as shown. Hold for 5 seconds. Alternate with the other arm and leg. Repeat 10 times, each side.

Coordination: training spinal muscles to work together

Strong muscles need to be coordinated. As the strength of the spinal muscles increases, it becomes important to train those muscles to coordinate with one another effectively. The following balance exercise is one way to will help you train your back muscles to work together to protect the spine.

Preparation:

- Maintain a tall posture throughout the exercises and good stability through the abdominals and trunk.
- Initiate a thorough dynamic warm up prior to starting this exercise, this engages the nervous system.

Movement:

(1) Single leg balance:

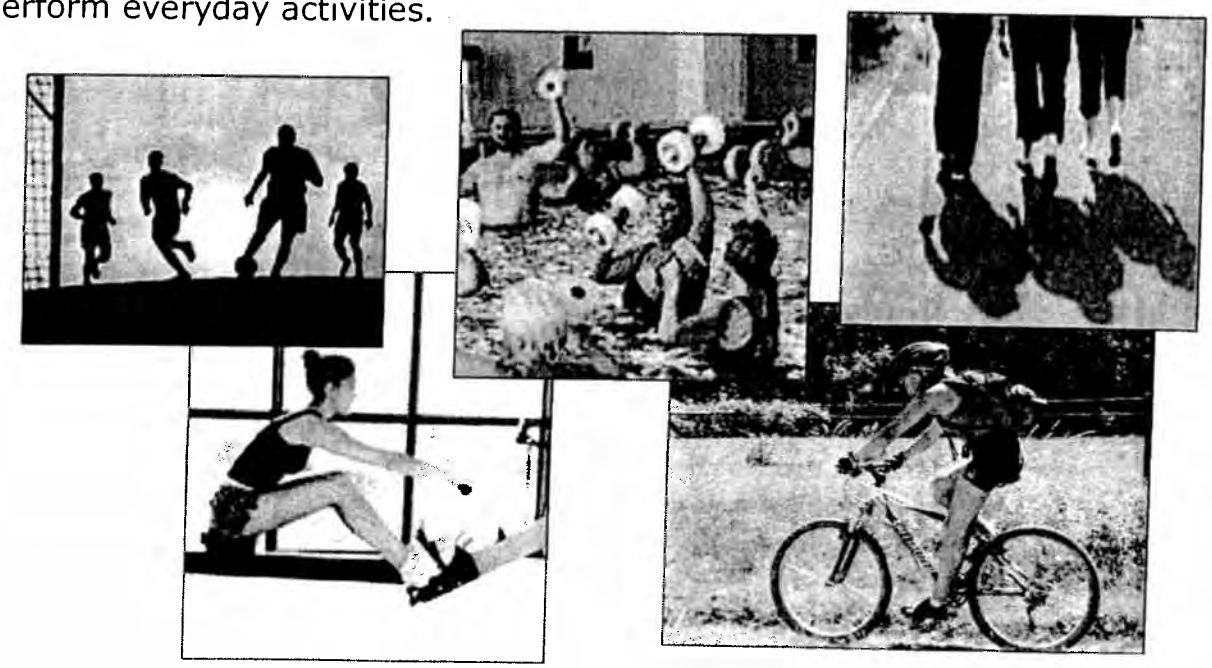
- Stand on one leg with knee slight bent (to about 20°).
- Hold for 20 seconds.
- Switch legs.

(2) Leg balance with a two arm rotational reach towards the stance leg:

- Stand on one leg with knee slight bent (to about 20°).
- Extend the arms straight out in front of the chest.
- Rotate the arms in the direction of the stance leg, keeping them at chest height - as shown.
- Return to the starting position.
- Switch legs.

Aerobic exercise: promoting a healthy weight to take pressure off of the lower back

"Aerobic" means "with oxygen". Conditioning through low-impact aerobic exercise is very important for both rehabilitation and maintenance of the lower back. By using oxygen as they work, the muscles to become better at obtaining nutrients and oxygen from the blood and eliminating chemical waste products that cause pain. Aerobic exercise also causes chemicals called endorphins to be released into the blood. These chemical hormones act as natural pain relievers. Consequently, aerobically fit patients have fewer episodes of low back pain, and experience less pain when an episode occurs. Well-conditioned patients are also more likely to maintain their regular routine, whereas patients with chronic low back pain who do not work on aerobic conditioning are likely to gradually lose their ability to perform everyday activities.



Some other benefits of aerobic exercise includes increased energy levels, improved mood, better sleep habits and decreased blood pressure. Aerobic exercise also burns calories and improves your metabolism, helping with weight loss.

- In general, to achieve maximum benefits, you should gradually work up to an aerobic session lasting at least 20 minutes, 3 or 4 times a week.
- Your exercise routine should consist of a 5-minute warm-up (including stretching exercises) before the aerobic activity and 5 to 10 minutes of a cool down (stretching and slower activity) after the activity.
- While performing the activity, your back should not be aggravated or strained in any way—make good, safe choices.
- It's all about your heart rate, maintaining an exertion level of between 5 and 7 on a 10-point scale (you should be able to speak, but not engage in a lengthy conversation).
- *Most importantly, choose aerobic activities that you enjoy and* stick with them*!*

CONCLUSION

Your back supports your entire body. Along with your muscles and joints, it allows you to sit, stand, bend and bear weight. But the back is also a complex, delicate and finely balanced structure that is susceptible to injury if not cared for properly. Knowing the basics of back care can make the difference between a healthy back and an aching one.

Learning any physical activity takes practice. Back muscles must be trained just like any other muscle group and that takes time, commitment and patience. However, once you have implemented a safe and effective back program, you will notice that you are standing straighter, that your back is strong and more flexible, and you move better as well. So stick with it!

Informational and Image Sources: http://www.mayfieldspine.com, http://www.spine-health.com & http://ptonthenet.com