



DID CAVEMEN HAVE LOW BACK PAIN?

by Paul Chek HHP, NMT

The gap between the average person and the Olympic gymnast, as a functional organism, is an indication of the degree to which we have under-used our bodies. The discovery of the first hominid (two-legged primate including all forms of humans) revealed our presence on earth about five million years ago. Except for gibbons (apes found in south-east Asia), there has been relatively little change in the anatomical structure of the low back as compared with our developmental progenitors. Why then have we seen progressive increase in the incidence of low back pain?

As hunter-gatherers, we maintained our strength, endurance, flexibility and vitality through various physical and mental stimuli, as provided by our multifarious environment. Today, the seated work place is number one in the world, sedentary lifestyles are the norm and more than eight out of every ten people will experience a bout of low back pain (LBP) in their lives. Of those who experience low back pain, 40-60% will have reoccurrence within one year. The great majority (90%) will get over their first incidence of LBP in three months, no matter how it's treated. The remaining 10% will begin often long journey for ongoing help, the expense of which will be 80% of all the dollars spent treating LBP in the US.

Although there is often great controversy over both accurate diagnosis and an etiology in cases of LBP, there is a growing consensus for exercise as a common denominator in prevention of this ailment. In questioning

my patients about their level of exercise, I am often told such things as:

- I get my exercise every morning when I take my dog for a walk.
- I walk to my car in the parking garage every day.
- I am very busy in the house. I bet if you added up all the walking I do between cleaning up and chasing the kids, you'd find I do more then most.
- I get all the exercise I need at work.

In none of these cases is enough exercise of the correct type being done to maintain either adequate or optimal levels of strength, endurance and coordination for prevention of back injury.

Exercise stimulus is known to be extremely beneficial in the healing and maintenance of ligament, muscle, tendon, cartilage and bone. To determine how much exercise must be done for maintenance of these structures one must consider the demands placed on them by activities of daily living (ADL). As you can imagine, the ADL of the carpenter or cement finisher will be significantly greater than that of a secretary, store clerk, professional driver, etc. A commonly overlooked fact by both medical professionals and patients alike, is that just because you get a lot of exercise at work as a carpenter, brick mason, or hustling-and-bustling waitress, doesn't mean that your exercise stimulus is adequate. On the contrary, most people are over-trained and have no functional reserve capacity. The first sign of this is that you

are exhausted when you leave work every day and often still feel spent when you wake up the next morning.

A simple way to determine your exercise needs is to realize that everyone is an athlete and should train as such. For example, do you think that if you were a collegiate 10K runner that your coach would have you run a hard 10K every day? It is only logical that if the coach were to implement such a program, breakdown would be inevitable. At this point I must ask you, what is the difference between the 10K runner that runs a hard 10K every day (who by-the-way will feel exhausted every evening and wake up spent every morning within a short time on this program) and the carpenter whose exercise program consists of working hard everyday swinging a hammer and carrying lumber. There really is no difference. Both of them are training at the top of their functional capacity. This is like constantly draining a battery and never recharging it.

In order to prevent low back injury (or musculoskeletal injury) strategic doses of exercise stress must be implemented into your lifestyle. A good program will consist of balanced doses of both general or aerobic exercise and specific exercises, i.e. strength and coordination exercises. The purpose of an exercise program is to stress your body beyond the exercise stimulus provided by your working environment. This results in super compensation and development of a larger functional capacity. After only four to eight weeks of conditioning, your work environment will provide only submaximal exercise stress, leaving you not only with more energy at work and after work, but less likely to be injured.

Aerobic exercise is necessary because it increases the availability of oxygen and nutrients to the working muscles and tissues (including bone). This is very important in prevention and treatment of low back pain injury because the back's postural muscles (erector spinae) have an aerobic metabolism. If the body's aerobic conditioning is poor, there is less available blood and oxygen during times of postural stress, such

as when leaning forward at the mirror to brush your teeth. If these muscles are aerobically deficient and are pushed to work hard for extended periods, they often spasm, becoming a frequent source of back pain from muscle strain. Done properly, aerobic exercise should last a minimum of eleven minutes with a good dose being thirty minutes, performed three times per week. Brisk walking, swimming, jogging or bicycling are all examples of aerobic exercise.

What Protects Our Backs Can Hurt Us Too!

All of us begin as children with a built-in lumbar (low back) protective mechanism. This mechanism is reflexively activated any time we are challenged with a load (expected or unexpected), or during a moment of lost balance. For example, most of us have unexpectedly stepped off a curb or stair, only to catch our balance and move on. In many LBP patients the lumbar protective mechanisms are dysfunctional due to long, histories of improper exercise technique, long term participation in the jobs or sports that encompass repetitive and often faulty movement patterns, as well as poor posture and plain-old disuse. It is for this reason that many back patients describe a jolt of acute back pain after such an event as picking up an object that they thought was much heavier than perceived, missing a kick during a soccer game or missing a step.

As a prerequisite to a functional lumbar protective mechanism, the body's nervous systems, must not only be challenged occasionally but there must be adequate conditioning in the torso and extremity musculature to respond without jeopardizing the joints and smaller muscles of the spine. The musculature that must be strengthened to assure stability of the low back are muscles in the front and back of the thigh, the erector spinae (back muscles), and the even more important abdominal muscles.

The best way to train the thigh musculature is to strengthen them in the pattern movement for which they are most commonly used when lifting an object. This is the squat. The squat

exercise can be done to fatigue (as shown in Figure 1) after work every other day or three times per week, adding a second and third set to fatigue when there is a minimal post-exercise soreness between sessions. Allow two days rest after the third squat workout of the week.

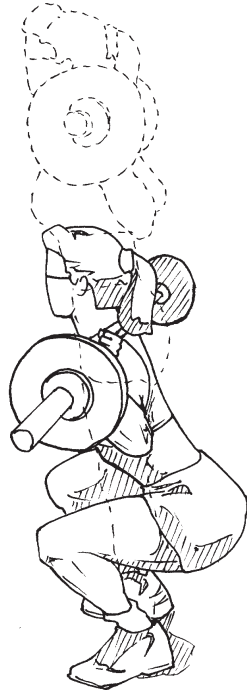


Figure 1
The Squat

- Begin by placing the feet shoulder width or slightly more apart and the toes turned out up to 30 degrees.
- If using a wooden rod or bar (as shown), place it to rest comfortably across the shoulders (never the base of the neck) with the hands slightly wider than shoulder width. If you are using a weighted bar, make sure you only use as much weight as needed, so that you can complete the exercise eight to ten times with perfect technique.
- In preparation for beginning the descent, hold the chest high with the shoulder blades pulled together slightly. Tilt the pelvis forward a little to increase the curve in the low back. The back is held in this position (throughout the squat) to protect the lumbar discs and aid in strengthening the postural muscles of the back.
- The descent is initiated with a slight bend forward at the hip, immediately followed by bending the knees.
- Look straight forward, with the chest held high.

- The knees must track directly in line with the second toe throughout the descending and ascending cycle, with the weight being equally distributed between the heels and toes.
- Descend as low as you can without losing your form. This may be to the point where the thighs are parallel to the ground, although this might be too hard in the beginning. Go only as far as is comfortable for you.
- The speed of the descent and ascent should be smooth and steady, without locking the knees at the top or bouncing out of the bottom position.

The Horse Stance exercises are safe and effective for those beginning a back exercise program. The easiest Horse Stance (HS) exercise is the HS vertical (Figure 2). This exercise can be used as both a beginner exercise or as a warm-up for the more advanced HS exercises.

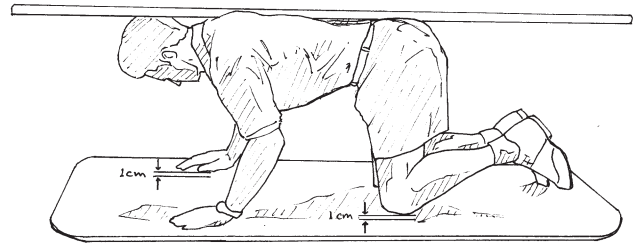


Figure 2
The Horse Stance Vertical

Start Position - to begin the horse stance exercises, position yourself as follows:

- The hands should be below the shoulders.
- The knees should be placed below the hips.
- The spine should be parallel to the floor and in neutral, or held such that the curves are not exaggerated at all, with the hand and the face parallel to the floor and the lower legs parallel to each other. You may need to bend your elbows, as shown, to bring the torso parallel to the floor.

Performing the Horse Stance Vertical:

- Lift one hand and the opposite knee off the floor just high enough to slide a magazine under them
- Hold for a ten count.
- After ten seconds switch to the opposite hand and knee for a ten count, repeating this process to fatigue or to 15 repetitions each side.
- The exercise requires that the small stabilizer

muscles of the spine work to resist the spinal torsion created by the diagonal pattern. When lifting the hand and knee off the floor, be careful not to let your pelvis deviate toward the support leg side. This faulty movement pattern will incorrectly shift the work out of the back and into the supporting hip.

The HS Horizontal and HS Alphabet (Figures 3, 4 and 5) are increasingly harder versions, serving as a progression in your program.

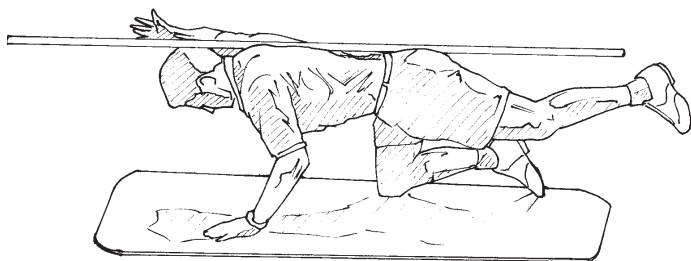


Figure 3
Horse Stance Horizontal

- Begin in the same start position as HS Vertical.
- Lift one arm 45 degrees out from the head and hold it parallel to the floor.
- Then, whilst holding the arm still, extend the opposite leg straight back and parallel to the floor.
- This position is held for a count of ten before switching sides and repeating the same.
- While doing the exercise, it is imperative that you maintain good form. As seen in Figure 4, there should be no deviation of the pelvis left or right, the arm should stay parallel to the floor and 45 degrees to the long axis of the body at all times.
- Spinal curvatures remain in neutral with the torso parallel to the floor, as in the HS Vertical.
- The HS Horizontal should be done to fatigue, which is either when you lose form or when the position can no longer be held for ten seconds. This exercise strengthens the postural muscles of the back and the posterior thigh muscles.

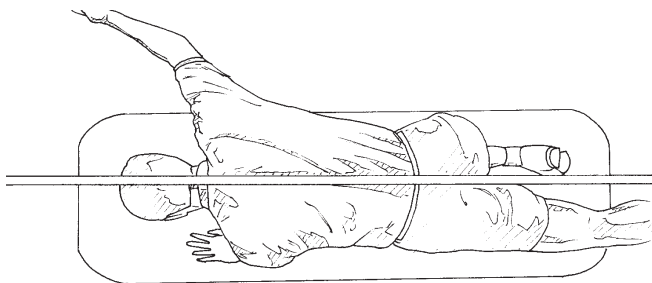


Figure 4
Top View of Horse Stance Horizontal

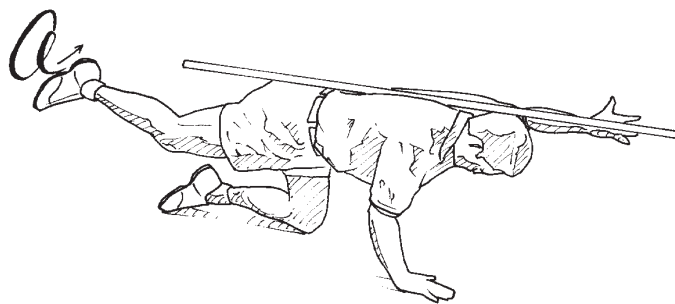


Figure 5
Horse Stance Alphabet

- The Horse Stance Alphabet is performed from the Horse Stance Horizontal position. Once in the Horizontal position, imagine that there is a pencil growing out of the end of your heel and that there is a pad of paper behind you. With this picture in mind, begin drawing each letter of the alphabet.
- The letters should be one foot tall, with half the letter above and half below the horizontal plane.
- Again, while doing the exercise, it is imperative that you maintain good form. There should be no deviation of the pelvis left or right, the arm should stay parallel to the floor and 45 degrees to the long axis of the body at all times.
- Spinal curvatures remain in neutral with the torso parallel to the floor, as in the other HS exercises.

Because many people do not have the arm strength to maintain good form for the duration of the exercise, the the Horse Stance Relief Position may be used. In the relief position, the exerciser performs the exercises exactly as above while resting on their elbows and forearms. From this position, the spine will not be parallel to the floor but the curvatures must be maintained in neutral.

What About Strengthening Your Abdominals?

The most poorly understood muscles are the abdominals. These muscles provide crucial support for the back in all planes of motion. Posturally, the lower abdominal muscles play a vital role in the stability of the low back. Lower abdominal exercises can be progressively added to your routine as your strength and coordination develop (see Figures 6 and 7).

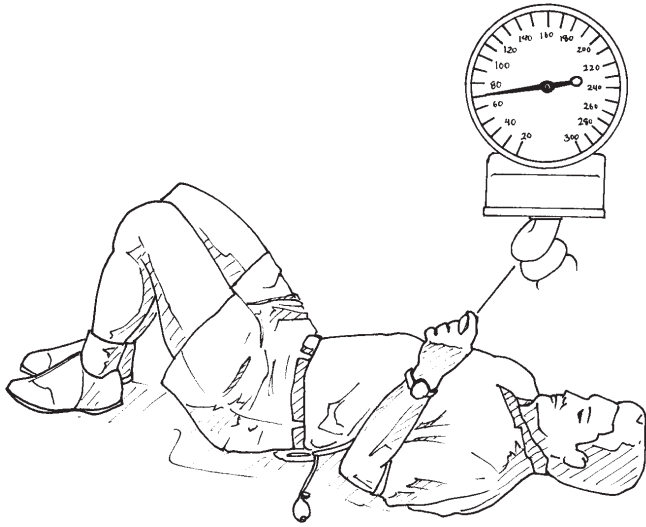


Figure 6
Lower Abdominal Exercises 1 and 2

Lower Abdominal Exercise #1 (LA 1)

- Lie on the ground with your knees bent and feet flat on the floor.
- Place a manual blood pressure cuff under your low back, directly under your belly button. Pump the blood pressure cuff to 40mmHg.
- Exhale, draw your belly button in toward your spine and gently increase pressure on the blood pressure cuff by rotating your tailbone toward the ceiling until the blood pressure cuff reads 70 mmHg.
- Hold this position for as long as is comfortable, up to 10 seconds, then rest for 10 seconds.
- Repeat this 10 times.

Lower Abdominal Exercise #2 (LA 2)

- LA 2 begins in the same position as LA 1. As with LA 1, inflate the blood pressure cuff first to 40 mmHg and then increase to 70 mmHg by exhaling, drawing your belly button toward the spine and rotating your tailbone towards the ceiling.
- Begin LA 2 by raising one foot off the ground until your thigh is perpendicular to the floor while keeping the blood pressure cuff pressure at 70 mmHg.
- Place the foot back on the ground and perform the same movement with the other leg.
- Alternate legs, performing 12-20 repetitions.
- When you are able to complete 20 repetitions without losing form, straighten the lifting leg for increased challenge.
- When thirty repetitions can be performed with a straight leg on each side, LA 3 is ready to be attempted.

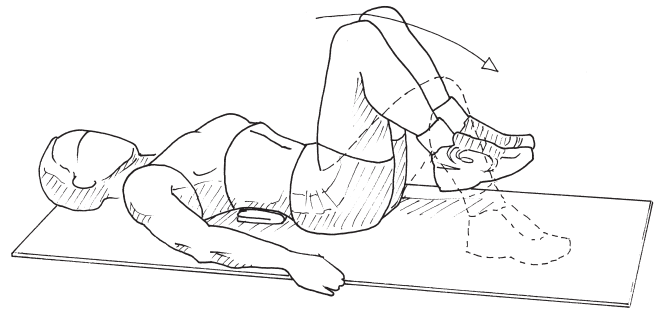


Figure 7
Lower Abdominal Exercise 3

- LA 3 is begun from the position of LA 1. Once the back is pressed against the floor (or blood pressure cuff), it is held there as the exerciser slowly raises the feet off the floor with the knees fully bent and relaxed.
- When the knees are pointed to the ceiling, or the thighs are perpendicular to the floor, the feet are alternatively lowered to the floor again. Always maintain constant pressure against the floor or blood pressure cuff.
- The exercise is done as long as perfect form can be held and never more than two minutes.
- To progress the exercise, simply allow the knees to straighten a little at a time.
- Then try lowering both legs at once. You may need to bend the knees again when you start with both legs at the same time.
- Always remember that the back should never be allowed to rise off the floor during the exercise. If this is happening, work only in the zone where the back can be stabilized. If the range is seemingly small, return to LA 2 and sharpen up there.
- LA 3 can be performed with a blood pressure cuff for feedback, as in LA 1 and LA2, or without. In this case, a small rolled-up towel placed under the lower back at the level of the belly button can be helpful. The towel should be approximately the thickness of your hand at the knuckles. (See image above and directions below on creating a lumbar support.)

The internal and external obliques provide the torso with most of its rotary strength and stability. These muscles deserve adequate attention and can be effectively strengthened with the Swiss Ball Russian Twist exercise shown in Figure 8-A & B.

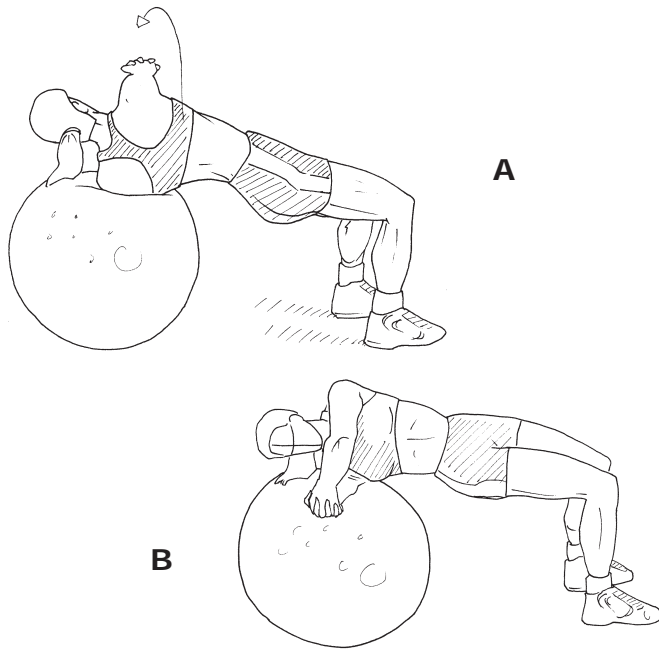


Figure 8A-B
Swiss Ball Russian Twist

- Roll onto a Swiss ball so that your head, shoulders and upper back are supported by the ball.
- Lift your hips up so that they are in line with your knees and shoulders.
- Clasp your hands and raise your arms so that they point straight up toward the sky (holding a weight will make the exercise more challenging).
- Place your tongue on the roof of your mouth, just behind your front teeth.
- Rotate the ball under you, going from side to side.
- Keep your head straight and look up at the ceiling, or let the head rotate with the torso, as shown above.
- Do not let your hips drop.

Most frequently, the upper abdominal muscles are over exercised by fitness enthusiasts, due to their esthetic qualities. Ironically, the upper abdominals usually possess adequate strength to do their job, unless you are very de-conditioned. If you can work up to the point of doing thirty crunches (as shown in Figure 9), there is not likely to be much more to be offered in terms of support for the low back, unless you are an athlete or perform heavy lifts on the job.



Figure 9
Swiss Ball Crunch

- Lie over a Swiss ball so that your back is comfortably on the ball, with both head and tail bone touching the ball.
- Your tongue should be on the roof of your mouth, behind your front teeth.
- As you slowly crunch up, imagine rolling up your spine from head to pelvis.
- On the way back, unwind from the low back to your head, one vertebra at a time.
- Exhale on the way up and inhale on the way back.
- Beginners should position their arms forward, as shown. For more challenging versions, cross your arms behind your chest or place your finger tips behind your ears. Don't support your head and neck with your hands.
- This exercise should be done to the point of fatigue on a three-times-per-week basis.

A fact often overlooked is that the lower abdominal musculature should be strengthened first, followed by the oblique, and finishing with the upper abdominals. This is because the upper abdominals are generally strong and require the least coordination to strengthen. The oblique and lower abdominals are both respectively weaker and require more coordinated movement patterns to strengthen. For this reason, the proper order to strengthen the abdominal musculature is always:

1. Lower
2. Oblique
3. Upper

Why Do I Get Back Pain When Exercising My Abdominals?

Many people with histories of low back pain find that they have a reoccurrence of back pain when trying to do abdominal exercises. This is often because the body will flatten the back in a compensatory effort to make more room for crowded nerve roots. When an exerciser who is unaware that they are compensating with a flat back attempts abdominal exercise, they are likely to feel pain because most abdominal exercises require that the spine be further flexed (forward bent), which aggravates the lumbar discs. To determine if you should be using a lumbar support to maintain your back's natural curvature during abdominal exercises refer to Figure 10.



Figure 10
Assessing your Lumbar Curvature

- *To determine whether you need lumbar support while doing abdominal exercises simply stand against a wall with the heels, buttocks, back and head on the wall.*
- *If the head will not touch the wall, don't force it.*
- *If your curvature is normal, when you slide your hand behind your back at the belt line level, the thickest part of your hand should just get caught between your spine and wall.*

- *If your curvature is reduced, your hand will get caught before the thick part can make it between the wall and your back. If the thick part of your hand can not tilt the curvature naturally, you should use a lumbar support during abdominal exercises as directed below.*
- *If your hand slides right through, you most likely have excessive lumbar curvature and should now emphasize lower abdominal exercises, using no lumbar support.*

A lumbar support can be made by rolling a towel to the width of your hand and to a thickest part of your hand. The lumbar support is then placed under your low back at belt-line level, or in such a position that it gives the lumbar curvature support. If it is placed correctly, it will feel good. The lumbar support is effective when used with lower abdominal exercises number 1, 2, and 3, as well as the oblique and upper abdominal crunch exercises (when performed on the floor, rather than on a Swiss ball). Care must be taken not to lift the behind off the ground during these exercises or the lumbar support will be of no benefit.

Prior to attempting any of the exercises demonstrated here, those with the history of LBP should consult a physician and a rehabilitation specialist for guidance. These exercises are also an excellent form of prophylaxis for preventing future occurrences of low back pain.

The HS exercises, along with other key back training exercises, are discussed in detail in Paul Chek's *Scientific Back Training Correspondence Course*. For more Swiss ball exercises for a healthy back, try Paul Chek's *Swiss Ball Exercises for Better Abs, Buns and Backs* DVD.

Paul Chek is an internationally recognized lecturer and consultant in the fields of corrective and performance exercise. He is a Holistic Health Practitioner, based in San Diego, CA.

For more information on the C.H.E.K Institute call **800.552.8789** or 760.477.2620. Also, visit us on the web at: **www.chekinstitute.com**.