

CAVEATS FOR EXERCISE

- 1) While there is a common belief among some “experts” that exercise sessions should be performed at least 3 times per week, it appears low back exercises have the most beneficial effect when performed daily.
- 2) The “no pain-no gain” axiom does not apply when exercising the low back in pained individuals particularly when applied to weight training, and scientific and clinical wisdom would suggest the opposite is true.
- 3) While specific low back exercises have been rationalized in this guide, general exercise programs that also combine cardiovascular components (like walking) have been shown to be more effective in both rehabilitation and for injury prevention. The exercises shown here only comprise a component of the total program.
- 4) Diurnal variation in the fluid level of the intervertebral discs (discs are more hydrated early in the morning after rising from bed), changes the stresses on the disc throughout the day. Specifically, they are highest following bedrest and diminish over the subsequent few hours. It would be very unwise to perform full range spine motion while under load, shortly after rising from bed.
- 5) Low back exercises performed for maintenance of health need not emphasize strength, with high-load low repetition tasks, rather more repetitions of less demanding exercises will assist in the enhancement of endurance and strength. There is no doubt that back injury can occur during seemingly low level demands (such as picking up a pencil) and that the risk of injury from motor control error can occur. While it appears that the chance of motor control errors, resulting in inappropriate muscle forces, increase with fatigue there is also evidence documenting the changes in passive tissue loading with fatiguing lifting. Given that endurance has more protective value than strength, strength gains should not be overemphasized at the expense of endurance.
- 6) There is no such thing as an ideal set of exercises for all individuals. An individuals’ training objectives must be identified, (be they rehabilitation, specifically to reduce the risk of injury, optimize general health and fitness, or maximize athletic performance), and the most appropriate exercises chosen. While science cannot evaluate the optimal exercises for each situation, the combination of science and clinical experiential “wisdom” must be utilized to enhance low back health.
- 7) Be patient and stick with the program. Increased function and reduction pain may not occur for 3 months.

5105 - 48 Street • Box 2120 • Stony Plain, AB • T7Z 1X6
tel. (780) 963-3466 / 963-6150 • fax. (780) 963-4102
toll free tel. 1-888-858-3466

Dr. Clark R. Mills
Dr. Robert Langenhahn
Dr. Darryl Johnson
Dr. Chad Kulak

enhancing low back health through stabilization exercise

prepared for. _____

date. _____

A DAILY ROUTINE FOR ENHANCING LOW BACK HEALTH

The following exercises have been chosen for the spine, enhance the muscle challenge, and enhance the motor control system to ensure that spine stability is maintained in all other activities. Each one has been quantified for these metrics. Having stated this, they are only examples of well designed exercises and may not be for everyone - the initial challenge may or may not be appropriate for an individual nor will the graded progression be similar among all people. These are simply examples to challenge all of these torso muscles.

Cat-Camel:

We recommend that the routine begin with the cat-camel motion exercise (spine flexion-tension cycles) to reduce spine viscosity (internal resistance and friction) and "floss" the nerve roots as they outlet at each lumbar level, followed by hip and knee mobility exercises. Note that the cat-camel is intended as a motion exercise - not a stretch, so the emphasis is on motion rather than "pushing" at the end ranges of flexion and extension. We have found that 5-8 cycles is often sufficient to reduce most viscous-frictional stresses.



The cat and camel exercise is a motion exercise and not a stretch. Good form includes the integration of the cervical spine with the lumbar and thoracic spine. All three sections of the spine should be flexed and extended together.

Curl-up:

The cat-camel motion exercise is followed by anterior abdominal exercise, in this case, the curl-up. The hands are placed under the lumbar spine to preserve a neutral spine posture. Do not flatten the back to the floor. Flattening the back flexes the lumbar spine, violates the neutral spine principle, and increases the loads on the disc and ligaments. One knee is flexed but the other leg is straight to lock the pelvis-lumbar spine and minimize the loss of a neutral lumbar posture. Alternate the bent leg (right to left) midway through the repetitions.



The curl-up is performed by raising the head and the upper shoulders off the floor. The motion takes place in the thoracic spine - not the lumbar or cervical region. To begin, the hands are placed under the lumbar region to support a neutral curvature. The exercise is made more challenging by raising the elbows off the floor. Even more challenging is first performing an abdominal brace (activating the abdominal muscles), and then curling up against the brace. Hold the posture for 7-8 seconds. Do not hold the breathe but breath deeply. Do not increase the challenge by increasing the intensity of the abdominal brace. This will groove desirable motor patterns. Choose the most appropriate level of challenge.

Side Bridge:

Lateral and abdominal muscles (called quadratus lumborum, and the abdominal obliques) are important for optimal stability, and are targeted with the side bridge exercise. The beginners level of this exercise involves bridging the torso between the elbow and the knees. Once this is mastered, and tolerated, the challenge is increased by bridging using the elbow and the feet. Advanced variations involve placing the upper leg-foot in front of the lower leg-foot to facilitate longitudinal "rolling" of the torso (see figure) to challenge both anterior and posterior portions of the wall, and further groove stabilizing patterns which are transferable to upright tasks. These are superior exercise in terms of muscle activation, low spine load, and stabilizing patterns compared to exercises such as performing a sit-up with a twist, for example, that produce lower muscle activity levels and higher tissue loads.



The beginners side bridge is performed with support from the elbow and knees while the more advanced variation using the elbow and feet. Maintain the abdominal brace, a neutral spine and breath deeply.



And advanced level side bridge involves holding the posture on one side for 7-8 seconds and the "rolling" over to the other, and repeating as endurance is increased. It is critical to lock the pelvis to the rib cage, via an abdominal brace, so that the spine remains rigid during the rolling. Finally, add deep breathing while in this posture. The rolling action with the breathing will prepare many people to meet any challenge with a stable spine.

Bird-dog:

The extensor program consists of leg extensions and the "bird-dog". In general, we recommend that these isometric holds be held no longer than 7-8 seconds given recent evidence from near infrared spectroscopy indicating rapid loss of available oxygen in the torso muscles contracting at these levels - short relaxation of the muscle restores oxygen. The evidences supports building endurance with increased repetitions rather than holding time.



The back extensors (both the lumbar and thoracic are important) are challenged with the bird-dog. But only one half of these muscles are challenged at a time by lifting the alternate arm and leg. This reduces the spine load to about a half of that produced during traditional spine extension exercises such as roman chair extensions. Begin on the hands and knees and hold the posture for 7-8 seconds. Then lower the hand and knee, and "sweep" the floor with them and raise them again for the next repetition. This motion will enhance the stabilizing patterns. Switch sides as appropriate. The abdominal muscle are braced throughout.