

## Assisting hospital staff with treating and preventing back pain

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Letvak, S. & Karper, W. (2011). Assisting hospital staff with treating and preventing back pain. *Journal for Nurses in Staff Development*, 27(6), 294-297.

**This is a non-final version of an article published in final form in Letvak, S. & Karper, W. (2011). Assisting hospital staff with treating and preventing back pain. *Journal for Nurses in Staff Development*, 27(6), 294-297.**

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<http://dx.doi.org/10.1097/NND.0b013e31823862b0>

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### **Abstract:**

Despite recent reports that occupational injuries requiring days away from work decreased since 2008, hospitals still remain in the top 10 industries for occupational injury, with 6.7 workers per 100 employees reporting an injury in 2009 (Bureau of Labor Statistics, U.S. Department of Labor, 2010). The prevalence of musculoskeletal injury in healthcare workers is well documented in the literature, and back pain is considered to be the most common work-related health problem in nurses (June & Cho, 2011). Many nurses seem to accept that back pain “comes with the job.” This view may prevent many nurses and other healthcare workers from seeking possible solutions, including the use of back exercises, to prevent injury or to improve existing back pain.

**Keywords:** occupation injuries | back pain | musculoskeletal injury

### **Article:**

Despite recent reports that occupational injuries requiring days away from work decreased since 2008, hospitals still remain in the top 10 industries for occupational injury, with 6.7 workers per 100 employees reporting an injury in 2009 (Bureau of Labor Statistics, U.S. Department of Labor, 2010). The prevalence of musculoskeletal injury in healthcare workers is well documented in the literature, and back pain is considered to be the most common work-related health problem in nurses (June & Cho, 2011). Many nurses seem to accept that back pain “comes with the job.” This view may prevent many nurses and other healthcare workers from seeking possible solutions, including the use of back exercises, to prevent injury or to improve existing back pain.

The Occupational Safety and Health Administration (2011) recommends that all healthcare facilities provide management leadership with employee participation, workplace analysis, accident and record analysis, hazard prevention and control, medical management, and training for workers. Hospitals and long-term care facilities have spent millions of dollars on ergonomic equipment and lifting teams to prevent injury. However, back injuries are still occurring. Injuries are costly, not only to the individual but also to the hospital with lost productivity and absenteeism. A recent 13-year longitudinal study of back pain in a tertiary medical center found that 31% of nurses and nursing assistants with back pain had lost work days related to pain (Pompeii, Lipscomb, & Dement, 2010).

Staff development nurses spend a significant amount of time in new employee orientation and, at yearly skill updates, discussing how to avoid back injury and proper lifting and transferring techniques. However, one area that is neglected is teaching healthcare workers about assuring their own health and safety. Although most adults will experience back pain at some point in their lives, steps can be taken to minimize the risk for injury and to treat pain when it occurs.

### **Causes of back pain**

There are numerous causes of back pain. The most common cause is occupational or athletic injury events which traumatize various low back tissue (McGill, 2007). Injury can also occur off the job doing routine tasks such as emptying the washing machine, raking leaves, or lifting grocery bags from the car trunk. Although some back pain can be linked directly to a specific incident, many times, the specific incident that brought on the discomfort is not known.

In addition, other sources of back pain may include various types of arthritis, especially osteoarthritis (due to repetitive injuries and “wear and tear” of the spine); herniated discs; congenital abnormalities; high levels of stress; obesity; and various soft tissue disorders. In rare cases, pain can be due to a more serious problem, including kidney disease or cancer.

### **Exercise as prevention and treatment**

An important strategy is the use of exercise for prevention and for use in regaining function once an injury has occurred. A positive feature of exercise is that doing it requires no special clothing or footwear, it can be done alone in privacy at home or in a setting with others, and there is no need (cost) for special equipment.

Numerous treatment approaches (e.g., ice/heat application, spinal manipulation, biofeedback, acupuncture, massage, transcutaneous electrical nerve stimulation, and yoga/Pilates) are often suggested in addition to standard medical care (e.g., prescription medication, traction, various interventional therapies, and surgery). However, all of the best research in this area and evidence-based clinical practice guidelines support the use of specific exercises for the prevention and treatment of spinal problems (National Institutes of Health, 2008; Smith & Grimmer-Somers, 2010). In fact, the National Institute of Neurological Disorders and Stroke advises that using exercise may be the most effective way to speed recovery from back pain (National Institutes of Health, 2008). In addition, there seems to be consensus in the reports cited previously that most people who injure their backs can safely apply self-care unless they

experience escalating pain or no reduction in pain over the first 2 to 3 days, bowel/bladder control problems, or total/partial loss of feeling anywhere in the body, especially in the hips and legs. In those cases and others when injured persons have any symptoms of concern or when they are uncomfortable with applying self-care, a physician should be consulted.

Nurses and all healthcare workers should know that regularly engaging in low-level impact aerobic exercise (e.g., walking, jogging, swimming, or biking) and striving for 30 minutes of participation per day can make a significant contribution toward having a healthy back (National Institutes of Health, 2008). However, there is new thinking relative to certain principles undergirding the prevention of back problems. Some of these are at odds with generally accepted ways of thinking about what is good for the spine. For example, maintaining a neutral spinal position during exercise or work is fundamentally important for back health. Most injuries happen while a loaded spine is flexed (bending forward) or extended (arched back) to the far ends of the range of motion (especially while in deep flexion or hyperextension). Those with a lot of spinal flexibility are actually at an increased risk for problems versus what many people believe. In fact, risk of disc and ligament damage is greatly elevated when a load is placed on the spine that is fully flexed. In addition, overall/generalized muscle strength is not related to protection from spinal injuries. It should be noted that muscle endurance (being able to do an activity longer with low resistance vs. doing it for a short while under a heavy load) is associated with reduced symptoms. Therefore, the goal is to make the spine durable through enhancing ongoing stability, not to make it more flexible. Moreover, it is important to train all of the muscles in the lumbar torso, not just the lower back and abdominal muscles. The belief that high levels of fitness afford protection against spinal injury is not strongly supported by the research literature, but maintaining a reasonable level of fitness is probably most beneficial (McGill, 2007).

### **Exercises to avoid**

Not all exercises support a healthy spine. Contrary to what many believe, straight leg or bent knee sit-ups and leg raises create too much spinal loading and compression and should be avoided. Even twisting curl-ups cause a lot of lumbar compression. Generating high torque while the spine is twisted creates a high risk for injury. Most people should never do sit-ups versus curl-ups. Doing curl-ups while adhering to proper positioning (see description below) may be beneficial. In addition, simply having stronger back and abdominal muscles (strength is defined as a single maximal exertion against some resistance) appears to have little protective value in reducing back problems; however, maintaining muscle endurance (being able to exert a force against resistance repetitively) in those muscle groups does appear to offer some protection. It is also important to be aware that placing the lower back into a posterior pelvic tilt (often recommended by exercise instructors in health clubs) when exercising the lumbar spine increases versus decreases the possibility of injury because of lower back flexing. Pelvic tilting increases spinal tissue loading and takes the spine out of the neutral position. Contrary to popular opinion, low back extension exercise machines can cause back problems during the flexion motion. In addition, any stretching exercises done during warm-up or cool down should be completed without any external resistance.

Another area of caution is the traditional “morning stretch.” The popular habit of toe touching and pulling both knees to the chest first thing in the morning to “loosen up” can cause spinal instability versus providing protection and should be avoided. In fact, after keeping the spine in a flexed position (like laying in the fetal position) or sitting for a long time, it is probably beneficial to stand and extend the spine for a short period before lifting anything very heavy (McGill, 2007).

## **Recommended Exercises**

To achieve protection from injury and to help regain function when the back is hurting, it may be beneficial for many people to exercise daily, always keeping in mind that developing a successful exercise protocol remains an individual matter and may require professional consultation. In addition, the specific exercises described here are provided to assist those healthcare workers who are not very fit as compared with some who habitually engage in high-level physical activity. Highly fit people probably will need more advanced activities. All people engaging in exercises for their back should never “push” through pain until first consulting a physical therapist or physician. Pushing through pain may place the person at high risk for problems.

The exercises described here should normally be done in an order or variation consistent with the person’s spinal and overall health status. They are examples of exercises that may be helpful for healthcare workers who are sedentary. These exercises were summarized from the evidence-based McGill (2007) material and can be used to aid in prevention or treatment. (Special note: Exercises used to recover function should be attempted only after acute back pain subsides.)

1. While on hands and knees, do spinal flexion/extension cycles (the cat/camel motion: Begin on all fours, hands directly under your shoulders and knees directly under your hips. Inhale and let your stomach drop to the floor while allowing your head to come back up. Exhale as you bring your stomach back up, rounding your back as you tuck your chin in and tuck your tailbone in). This is intended to be a motion exercise, so the exerciser should not push into deep flexion or hyperextension positions. Five or six cycles are suggested.
2. While standing, perform half squats. The pelvis should move down (45° angle) and toward the back, and the spine should not move at all. This is a controlled sitting down and getting up movement. It may be helpful to place a chair under the buttocks for safety.
3. Perform curl-ups with one leg straight and one knee bent (at 90°), keeping both hands under the lumbar spine for support and leaving the elbows on the floor during the curl-up motion. Do not lift shoulders too far off the floor, do not flex the cervical spine (neck), and do not twist. There should be no lumbar or cervical spine motion during each curl-up. (Inexperienced exercisers may need someone to demonstrate the proper curl-up motion or watch them do one to be sure they are doing it correctly).
4. Perform side bridges. Lying on the side, support the body weight on just the knees (keeping knees together) and one elbow/forearm. Brace the spine in a neutral position (activate flexor and extensor muscles at the same time)—do not allow the torso to slump or sag. The arm not used for

support can be placed across the chest or the hand on the unused arm can lightly touch down on the floor/mat for balance. Keep both knees flexed. If you are moderately or highly fit, you may be able to do this exercise by supporting your body on one elbow/forearm and feet—placing the top foot in back of the other foot while keeping the torso (spine) braced in a straight (neutral) line. Conversely and if you are poorly conditioned, this exercise can be done leaning sideways against a wall while standing and leaning into the wall on the elbow/forearm with one foot placed in front of the other foot.

5. Perform variations of the bird dog exercise. On hands and knees with hands under the shoulders and knees under the hips, a person with significant back discomfort should just lift one hand or knee off the floor/mat and slowly attempt to straighten the limb out horizontally (arm straight out in front or leg straight out in back). There should be no spinal motion. The spine should be kept straight (neutral) and the abdominal muscles should be kept tight. After this can be accomplished separately with all four limbs and pain-free, move on to raising the opposite hand and knee at the same time, slowly progressing to where both limbs can be raised to the horizontal position at the same time without pain followed by switching over and doing the same thing with the other arm and leg.

It is recommended that any static (isometric) hold or bracing for any exercise should be executed for no longer than 7–8 seconds.

Although almost all adults will experience back pain at some time in their lives, nurses and healthcare workers are especially at risk for chronic back pain and spinal injury. Healthcare workers can protect themselves from injury by doing these daily exercises, which do not take much time. In addition, the recommendation is that moving around as much as is tolerable is more helpful than horizontal rest while dealing with back pain. In fact, resting in bed for more than 2 to 4 days may have debilitating effects (National Institutes of Health, 2008). A recent synthesis of clinical research trials reported in the Cochrane database found that patients with low back pain experience pain relief and functional improvement from advice to stay active compared with advice to rest in bed (Dahm, Brurberg, Jamtvedt, & Hagen, 2010). It is also important to note that it may take at least 3 months to regain full, pain-free function after certain back injuries. Finally, all healthcare workers, and especially younger nurses and nursing assistants, need to make their own health a priority. Doing several minutes of daily exercises to protect the spine may prevent future injury and pain, enabling a productive and long-term career.

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