

## LOW BACK PAIN AND A CASE FOR EARLY PT

By Jessica Heath and Neal Goulet

Scan Major League Baseball's injury report in any given month, and among the sore elbows and shoulders, you'll find a good number of back woes.

A pitcher complains of back stiffness while working his way back from Tommy John (elbow) surgery.

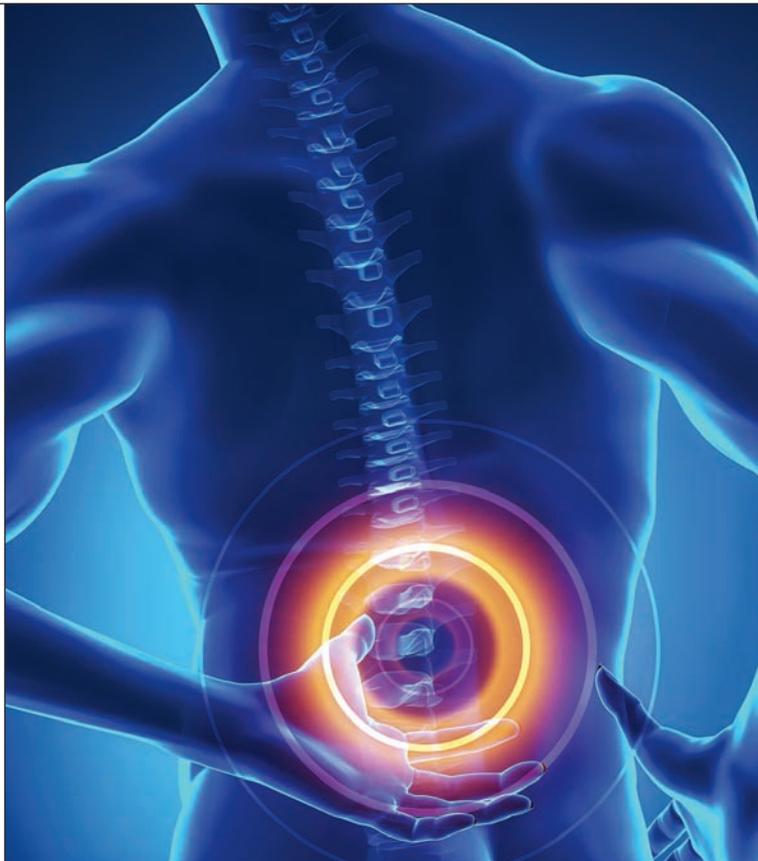
A middle infielder leaves a game because of stiffness in his lower back. On a swing, he says afterward, "pain just shot up my back."

A third baseman undergoes surgery for a herniated disk that will require 10 to 12 weeks of recovery.

These are just the examples that grab headlines, of course. Odds are that you know someone – perhaps it's even you – who has low back pain. Eighty percent of us will experience low back pain at some point in our lives.

Although most cases of back pain eventually subside, it is the most common cause of job-related disability and a leading reason for lost workdays. In 2004, according to the American Academy of Orthopaedic Surgeons, 25.9 million people lost an average of 7.2 days of work because of back pain: a total of 186.7 million workdays.

Treating all of those people



**A physical therapist can assist with strategies related to levels of activity, pain and health care costs.**

– surgery, prescription drugs, doctor's visits, and the like – with all of that back pain comes at a hefty cost. In 2005, Americans spent \$85.9 billion, according to a study published in the *Journal of the American Medical Association*, up from \$52.1 billion in 1997. Other estimates put the cost at north of \$100 billion.

Yet despite increasing expenditures to combat low back pain, the rate of incidence

continues to rise: 15 percent of U.S. adults reported back problems in 2005, compared with 12 percent in 1997.

There is some good news on the treatment and cost fronts, however. According to one study (see page 4), patients treated early with physical therapy (within the first 14 days of incidence) have lower overall health care costs as they have a "reduced risk" to need additional health care services.

### 'LIKE A ROCK IN YOUR SHOE'

When we talk about low back pain, we're referring to the spine. It is made up of small bones, called vertebrae, as well as muscles, ligaments, nerves, and intervertebral disks, which act like shock absorbers between the vertebrae.

The low back refers specifically to the lumbar spine, which comprises five vertebrae that connect the spine to the pelvis.

Low back pain varies from person to person. Aging (it is more common in those ages 40 to 80), sedentary lifestyles, genetics are among the factors, but the exact cause often proves elusive.

Low back pain can occur over time or suddenly. It can be of short duration or long. The pain can be sharp or stabbing, dull and achy. Typically it resolves itself in the short term, but it is likely to recur.

"Low back pain is like having a small rock in your shoe that you can't get rid of," writes Guido Van Rysseghem, coordinator and clinical athletic trainer at Oregon State University.

"When you step on the little rock, it hurts. When the little rock moves to the side of your shoe, you have no pain because you don't step on it. In reality, however, you can't get rid of this little rock, and you keep on stepping on it. Low back pain is like this – it causes pain at times and never really goes away."

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Among the causes, according to the American Academy of Orthopaedic Surgeons:

**Over-activity:** Muscles and ligament fibers can be overstretched or injured, often the result of the first softball or golf game of the season or too much yard work.

**Disk injury:** Low back pain that doesn't resolve within days could suggest a disk tear or herniation. The latter often occurs with lifting, pulling, bending or twisting and can put pressure on the nerve root leading to the leg or foot, with pain resulting in the buttock or down the leg (sciatica).

**Disk degeneration:** With age, disks can wear away and shrink, resulting in pain and stiffness as the vertebrae rub together (osteoarthritis).

Treatment generally falls into one of four categories: medications, physical medicine, surgery or physical therapy.

A primary physician may prescribe medication to assist with managing symptoms. This may include non-steroidal anti-inflammatories (NSAIDs), muscle relaxants to assist with spasms, and/or narcotics to help with severe pain episodes or chronic low back pain.

If medication alone fails to relieve the symptoms, a patient may be referred to physical medicine or a physiatrist for an epidural. This is a steroid injection, often cortisone, directly into the epidural space of the spine at the location of the nerve that may be causing low back pain and, often, lower extremity symptoms.

As a last resort, a patient may be referred to a surgeon for consultation. Surgery may consist of discectomy, laminectomy or fusion, each with the goal of relieving pressure on a nerve that may be causing pain.

## BENEFITS OF EARLY PT

Physical therapy may be prescribed to assist with pain control and to improve mobility. Treatment may consist of modalities for pain relief; range-of-motion and flexibility exercise; manual therapy to improve the mobility of joints and muscles; strengthening; and prevention of recurrence to include body mechanics, training and home tasks.

Dr. Julie Fritz, lead author of the study cited earlier, said the value of physical therapy "likely depends" on the timing of a physician's referral and a patient's adherence to maintaining and improving activity levels. The study "found that about half the patients receiving treatment from a physical therapist did so within two weeks, which is a practice that may be justified by emerging evidence," she said.

That evidence suggests that a physical therapist can help patients move toward a more active and self-directed approach to addressing low back pain. ▀

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Q&A

# LOW BACK PAIN

By Jeremy Ansbach and Alicia Bettis

## WHAT IS THE ANATOMY OF THE LUMBAR SPINE?

The bones of the lumbar spine (vertebrae) are separated by an intervertebral disc. Multiple ligaments (they attach bone to bone) help support the spine. Between each vertebra is an exiting nerve root that extends from the spinal cord and often can be the source of pain or contribute to symptoms manifesting in the lower extremity. Many muscles (superficial to deep) help to stabilize the spine, and most of them are attached to the spine itself. Arteries and veins also can be found in this region, possibly contributing to symptoms in the lower extremities.

## HOW COMMON IS LOW BACK PAIN?

Approximately 80 percent of the population will experience low back pain during their lifetimes.

## WHAT CAUSES LOW BACK PAIN?

Low back pain most commonly is musculoskeletal in nature. Abnormal movement patterns can cause improper recruitment of muscles, causing increased loads to the low back and spine. Hypomobility or hypermobility of joints of the lumbar spine also can cause back pain by impinging on nerve and soft tissue. Degeneration of the joints and intervertebral

discs can result in joint-space narrowing and bone spurs that can put pressure on the nerve roots of the spinal cord. Increased muscle tension caused by emotional stress can manifest into physical pain.

## HOW CAN PHYSICAL THERAPY HELP WITH LOW BACK PAIN?

A physical therapist can prescribe exercises that help correct the faults/weaknesses or perform hands-on procedures including stretching and mobilization to reduce the abnormal stress placed on the spine by postural limitations. A physical therapist can educate the patient about proper posture and mechanics to reduce the risk of future injuries.

## WHY IS EARLY PHYSICAL THERAPY BENEFICIAL?

Early physical therapy after a low back injury can reduce the number of days the patient is in pain, which decreases the possibility of the injury becoming chronic. Most low back injuries respond well to conservative management. The sooner a patient receives therapy, the better the chances for success. Therefore, early referral to physical therapy can result in significantly lower health care costs (medications, imaging, surgery) and improve a patient's quality of life. ▀

## CASE STUDY

## RUNNING ON: LUMBAR NERVE LEADS TO CALF PAIN

By Jason Williamson

### PATIENT HISTORY

A 59-year-old male was referred to physical therapy for left calf pain. He complained of progressive pain, which occurred intermittently in the past six months and only while running. He was unaware of any mechanism of injury. He was expected to run in a marathon in two months.

He had seen his primary care physician and a podiatrist for his leg pain. He had undergone multiple diagnostics, including an ultrasound and plain film X-rays, which were negative for a deep vein thrombosis (blood clot) and stress fractures, respectively. He had been fitted for and was wearing bilateral custom foot orthotics. He was wearing a night splint for left calf flexibility and knee-high compression stockings for swelling.

He was unable to run more than two miles because of the calf pain, even after purchasing a new pair of running shoes. He decreased his pace and ran only on level surfaces without a change in his symptoms. Next, he stopped running altogether and turned to cycling as an alternate training method for his marathon. He had no pain when walking or cycling.

Per his podiatrist, he performed calf flexibility exercises, demonstrating good technique and adequate hold times. He was scheduled for an MRI of his left leg in three weeks. It was suggested that he try physical therapy in the interim.

### ASSESSMENT

At initial evaluation, the patient reported no leg pain during rest. His pain increased with running and became sharp



**The patient underwent three weeks of physical therapy, education and behavior modification in order to return to marathon training.**

to a rating of 7/10 using a visual analog scale. Postural observation revealed slight atrophy of his left calf when compared with his right. He had an anteriorly tilted pelvis and increased lumbar lordosis (curve of spine).

During walking assessment, his left lower extremity excessively rotated externally, and he had a left medial heel whip, suggestive of tight hip external rotators. During the interview portion of his examination, the patient sat with his left leg crossed over his right. Spinal assessment showed no curve reversal during forward flexion.

He had a slight right trunk deviation during flexion, as well. Lower extremity assessment revealed bilateral one-joint and two-joint hip flexors limitations. Special testing was negative for nerve tension. Repetitive spinal motion testing was unable to

reproduce his symptomatic leg pain, but repetitive prone lumbar extension did cause central low back pain.

The initial hypothesis was that lumbar nerve root compression was causing left calf pain with postural fatigue, tight anterior hip muscular and weak gluteal muscles all contributing to his symptoms.

### TREATMENT

Treatment involved a multifaceted methodology of addressing his mechanics and included flexibility, progressive functional strengthening, and behavior modification. During Week 1, he was seen five days per week for improving flexibility of his spine and lower extremities. Manual and patient self-stretching were performed to improve muscle flexibility of his bilateral hamstrings, bilateral hip flexors, and left piriformis.

He was instructed to perform repetitive prone lumbar extension four to six times per day, seven days per week. Regarding behavior modification, he was asked to avoid sleeping on his left side, and to use pillow placement to decrease stress on his left hip and lumbar spine. He was instructed to sleep on his right side; to avoid cycling and swim instead; and not to cross his left leg over his right. He was instructed in diaphragmatic breathing techniques.

Week 2 consisted of the same flexibility regime with the addition of strengthening exercises for his left hip. These exercises consisted of supine bridging, standing ballet gluteus squeezes, and closed chain hip abduction. He was seen on three days and asked to continue all self-static stretching exercises for the days when he was not in therapy. Education was provided to reinforce behavior modification tasks.

Because of time constraints and his need to resume training, he performed a trial running session. He was able to run five miles without leg pain. He was cleared to resume running, stopping if his pain returned. He was instructed to stretch prior to running using a dynamic warm up of high knees, butt kicks, lateral lunges and A-skips.

### OUTCOME

After three weeks of physical therapy, education and behavior modification, the patient was able to return to marathon training without calf, leg or low back pain.

His MRI was cancelled. He modified his training to include more flexibility and lumbar range-of-motion tasks. His marathon time was a personal best. ▀

## RESEARCH ABSTRACT

## EARLY PT'S EFFECT ON HEALTH CARE USE AND COST

By Dr. Irene Davis

### INTRODUCTION

Low back pain is prevalent, accounting for up to 3 percent of all physician visits in the United States. This condition is on the rise: a 65 percent increase in medical costs associated with low back pain over the past 15 years.

Unfortunately, low back pain often becomes chronic and disabling. Current practice guidelines recommend delaying physical therapy for several weeks after the medical consultation as it is believed that most patients recover quickly on their own. However, this has not been examined in a systematic way. The purpose of this study was to evaluate the effect of timing and content of physical therapy on health care utilization and cost.

### METHODS

Data were extracted from a national database of employee-sponsored health plans. Of the 76,109 patients with low back pain, 32,070 met the eligibility requirements. These included age (between 18 and 60 years old); no prior spine surgery; no low back pain in the past six months; and no possible non-muscular cause of low back pain.

Physical therapy utilization within 90 days of the consult was recorded; that which occurred within 14 days was considered early utilization. The content of physical therapy was



This study looked at the effect of timing and content of physical therapy in treating patients with low back pain.

determined by examining CPT codes, which provided information regarding the adherence to guideline recommendations.

Outcome variables were determined in the 18-month period after the initial medical consult. These variables included imaging, number of physician visits, injections, surgery and opioid medication. The total cost of these outcome variables was calculated.

### RESULTS

Overall physical therapy utilization was only 7 percent. However, the majority of patients

did go to physical therapy within 14 days of their primary care visits. There was significant geographic variability with regard to other treatments including imaging, opioids, injections and surgery.

Despite this, early physical therapy was associated with a reduced risk for each of these other treatments. This resulted in an overall reduction in medical costs of \$2,736 per patient when receiving early physical therapy.

The content of the physical therapy was not strongly associated with any of the outcome variables.

### DISCUSSION

Based upon the results of this study, overall physical therapy utilization for low back pain is low. However, physical therapy that is initiated within 14 days of initial consult results in significantly lower health care costs. ▀

### REFERENCE:

Fritz, J.M., Childs, J.D., Wainner, R.S., Flynn, T.W. "Primary care referral of patients with low back pain to physical therapy: impact on future health care utilization and costs." *Spine*. 2012; 27(25):2114-2121.