Low Back Pain

Diagnosis and Treatment

Philip Shaver, MD

Nearly 80 percent of Americans will experience low back pain at some point in their lives. It is one of the most common reasons for a physician's office visit and it is estimated to cost the United States economy more than $100 billion dollars annually. To examine the different types of low back pain, as well as their causes and treatment options, Healthy Living Magazine assembled a group of distinguished physicians for a roundtable discussion. Participants included Eisenhower Neurosurgeon Farhad Limonadi, MD, Eisenhower Neurologist Reza Nazemi, MD and Eisenhower Physical Medicine physician P. Jeff Smith, DO. The session was moderated by Eisenhower Cardiologist Philip Shaver, MD.

Dr. Shaver: **A number of factors can lead to low back pain, including work that requires heavy lifting, physical inactivity, obesity, pregnancy, bad posture, arthritis and age. Let's start with some definitions. What do we mean by "spinal stenosis"?**

Dr. Nazemi: Spinal stenosis means narrowing of the spinal canal, which can be caused by many factors — herniated disk, degenerative disk, spondylosis or build up of calcium.

Dr. Limonadi: The spinal canal has a small diameter. Important structures go through it, including the spinal cord, nerve roots and the vessels that supply the nerve roots. When people get spinal stenosis as the result of facet enlargement or disk bulging, it can cause a number of problems as a result of impingement of the nerve roots, spinal cord, or the vessels supplying them.

Dr. Shaver: Aging is a factor and the facets enlarge as we age.

Dr. Limonadi: If you look at load bearing surfaces on the spine, it consists of the disk between two vertebral bodies in the front and in the back — the two facet joints. Think of it as a tripod. As we age, the disk starts getting dehydrated and loses a little bit of height. It bulges into the central canal making the canal smaller, but it also passes some of its load bearing work to the facet joints, which causes them, in turn, to get inflamed and enlarged. These factors result in spinal stenosis.

Dr. Shaver: In our population, which is over 60, what is the major pathology patients have when we describe spinal stenosis?

Dr. Smith: Degenerative disk disease.

Dr. Nazemi: To understand the concept of low back pain, we need to understand the structure of the lower back. The spinal unit consists of subcutaneous tissue,muscles, ligaments, joints, disks, nerve roots, bones, meninges [membranes] and spinal cord. Injury, inflammation or malfunction of any of these components may cause back pain. In an older person, there could be some other issues going on, such as diabetes, shingles, etc.

Dr. Shaver: What about sciatica?

Dr. Nazemi: Sciatica is a severe pain shooting down or radiating down one leg or both legs. It is due to impingement of the nerve root that supplies the sciatic nerves.

Dr. Shaver: Let's say, I was working in the garage over the weekend and now my lower back is bothering me. It's painful, but I don't have other symptoms. The guidelines tell me I should just tough it out, take some antiinflammatories, and rest.

Dr. Smith: More often than not the pain goes away because it's a strain of the muscles. If over some time (six to eight weeks), it's not going away, we need to seek diagnostic studies.

Dr. Shaver: When pain becomes chronic there are some psychosocial markers — for instance, job dissatisfaction, depression, substance abuse, the desire for compensation — which often drives the pain. How much do you delve into the psychosocial?

Dr. Nazemi: In my practice, I see a lot of patients in chronic, recurrent back pain.An astute physician will consider all possibilities, and he will look hard to find any reason for prolongation of this pain, including psychosocial considerations. The only way to find out the underlying cause is to sit down with the patient and talk in detail.

Dr. Shaver: When would you order imaging studies on a patient?

Dr. Nazemi: I would go ahead with imaging studies if there is evidence of nerve root compression such as numbness, loss of sensation,muscle weakness…also, loss of bladder or bowel control, urinary retention, loss of sensation in the genital area. These are all evidence of nerve root impingement.

Dr. Limonadi: Psychosocial causes of back pain are not uncommon and should be considered in the differential diagnosis of chronic back pain, especially when a surgical intervention is being entertained. It is, therefore, of utmost importance to perform a comprehensive evaluation of patients with neck or back pain and make the correct diagnosis, and then to start with conservative measures as the first line of treatment unless dealing with an emergency where the patient is losing neurological function. Utilization of the latest technology in the surgical treatment of neck and back pain (when surgery is necessary) and an evidence-based approach to each disease should also be emphasized.

Dr. Smith: For acute back pain, I like chiropractic, and I like osteopathic manipulation. But you have to be careful with manipulation with chronic back pain.

Dr. Shaver: I am interested in your thoughts on what other things patients can do in the first three to four weeks to treat their pain.

Dr. Smith: I trust physical therapists. I trust that they use my diagnosis and that they can make a diagnosis on their own — a physical therapist has the knowledge to diagnose, as well as treat.

Dr. Limonadi: Prescribing physical therapy consisting of back and abdominal strengthening exercises is an example of an evidence-based approach in the treatment of chronic back pain. Strengthening the accessory muscles of the spine can result in significant reduction of chronic neck and back pain.

Dr. Nazemi: I think regular exercises help. Strengthening of the abdominal muscles certainly would help. Good body mechanics are very important issues, how to bend, how to lift, how to move, how to walk.

Dr. Limonadi: The treatment of back pain starts with understanding the dynamics of the spine and the pathophysiology of the spinal diseases. In a simplistic manner, think of the spine as a bridge. A bridge eventually deteriorates. The steel that makes the bridge is similar to the bone. If it starts deteriorating, the bridge collapses. The cables on the bridge are similar to accessory muscles of the spine, so if they deteriorate, eventually the spine deteriorates. Like the spine, every bridge has joints, to render it more dynamic and hence, more stable. They require maintenance…, and so do the joints in the spine.

"The treatment of back pain starts with understanding the dynamics of the spine and the pathophysiology of the spinal disease."
—Farhad Limonadi, MD

Dr. Shaver: Do muscle relaxants have a role?

Dr. Nazemi: Yes, for a short course, especially when the patient is in severe pain, can't move and is having spasms.Muscle relaxants are safe for four to six weeks.

Dr. Limonadi: I agree with this, but let's not forget our over-the-counter, non-addictive, medical options, such as ibuprofen and acetaminophen.However, patients should be warned about excessive use of each which can result in kidney, liver or GI [gastrointestinal] injury. Switching between the two may minimize the side effects of each.

Dr. Shaver: At what point do we start talking about epidurals [spine injections]?

Dr. Nazemi: Once the patient is having symptoms of nerve root impingement and the severe disability associated with that, with no neurological deficits, I would recommend epidural blocks.

Dr. Shaver: Is there a limit to the amount of epidurals? How often can you get them?

Dr. Smith: That's a controversial area in my field. There is not good research. The cumulative effect of steroids can weaken bone and cause other issues.Most clinicians say four epidural steroid injections a year is the maximum.

Dr. Shaver: Is it an effective cure? Does it change anything?

Dr. Limonadi: It can be effective in certain cases. It can also play a diagnostic as well as therapeutic role in the treatment of chronic neck and back pain.

Dr. Shaver: When do you refer a patient to a surgeon?

Dr. Nazemi: I refer patients to neurosurgeons when they are having intractable pain that is unresponsive to conservative treatments, and if they are a good candidate for surgery based on their age and medical history…also, patients who develop neurological deficits.

Dr. Shaver: How has surgery changed in the last three to four decades?

Dr. Limonadi: Surgical approach to degenerating spines in our aging population is rapidly advancing.Minimally invasive approaches, utilization of growth factors and cytokines, such as Bone Morphogenic Proteins (BMPs) in spinal surgeries, and popularization of intraoperative neurophysiological monitoring during surgeries are some examples.However, there is also evidence of perhaps over-utilization of spinal instrumentation in some cases. This highlights the importance of an evidence-based approach and an indepth knowledge of the pathophysiology of each disease.

Dr. Shaver: When is a fusion necessary?

Dr. Limonadi: In several situations, such as in a case of an unstable spine as the result of trauma, or in a case of a symptomatic degenerated slipped disk or what's called spondylolisthesis. In spondylolisthesis, the spinal vertebral bodies are not aligned — they move forward and backward where they shouldn't, which can cause pain, weakness, or numbness. If conservative measures fail, you need to stabilize that segment of the spine with surgery.

Dr. Shaver: What if surgery is not indicated and pain continues despite injections and other conservative therapies?

Dr. Smith: Spinal cord stimulation is an option. A device is implanted and sends a signal to the spinal cord to block pain signals. Spinal cord stimulation has moved up the ladder in the continuum of care because of its efficacy and low complication rate.

Dr. Limonadi: There are two very important things we should not overlook in treatment of low back pain. First, is to maintain an appropriate weight, and second, do not smoke. Smoking does lead to acceleration of the aging process and degeneration of spine.

Dr. Shaver: If a patient does some of the things we've advised — they lose weight, they quit smoking, they exercise — is there a chance of reversing any of the damage that may have been done to the lower back?

Dr. Smith: Yes.You can reverse some of the damage from smoking and drug abuse. You can reverse the atrophy of the spinal accessory muscles by working out.You can actually even reverse bulging disks.