

The most common problem related to pain (a frequent issue among our military servicemen and servicewomen returning with war-related injuries)—for which medical advice is sought—is back pain. Norman J. Marcus, MD, DABPM, believes that muscles are actually the most common source of back pain, but says a thorough examination of muscles is rarely, if ever, done. Dr. Marcus has created a protocol for evaluation and treatment of acute and chronic pain that includes the assessment of muscles as a source of pain. His approach is based on the methods taught to him by his former colleague, the late Hans Kraus, MD, father of sports medicine, and physician to President John F. Kennedy who suffered with chronic back pain.

Here, Dr. Marcus addresses the relation between muscles, back pain, and exercise.

EP: Tell us about Dr. Kraus' theory behind muscle pain treatment and the exercises he developed for treatment.

Norman J. Marcus, MD, DABPM (NM): Dr. Kraus, who originally was an orthopedic surgeon, actually established the first multidisciplinary pain center in the world in the late 1950s, which very few people know. It was at the Columbia University School of Medicine in the department of orthopedic surgery. There were psychiatrists, social workers, psychologists, physical

PART 3:

Muscles, Back Pain & Exercise – How Are They Related?

An Interview with Norman J. Marcus, MD, DABPM

By Lorraine Cancro, MSW

therapists, physiatrists, and orthopedic surgeons, treating and trying to understand back pain.

They found that about 80% of patients presented with nothing that could be demonstrated on an x-ray or physical exam that suggested there was some anatomic pathology, so they tried to understand it from the perspective of conditioning since that was Dr. Kraus' background. They studied about 3,700 patients for 4.5 years and created a test—called the Kraus-Weber test—and an exercise program to go along with the test to deal with what they thought were the types of functional muscle pain that exist.

They broke it down into four types of muscle pain:

- Tension
- Deficiency, which is defined as weakness and stiffness
- Spasm
- Trigger points

They created the Kraus-Weber test to assess a minimal acceptable level of trunk muscle strength and flexibility, which in and of itself, was a very unique concept. They were saying that, in order for a person to function in a relatively normal way, they needed to pass these six test items, which are:

1. Touching the floor with your legs straight and feet together to test back and hamstring flexibility

2. Sitting up with legs extended to test abdominal and hip flexor strength

3. Sitting up with knees bent to test abdominal strength

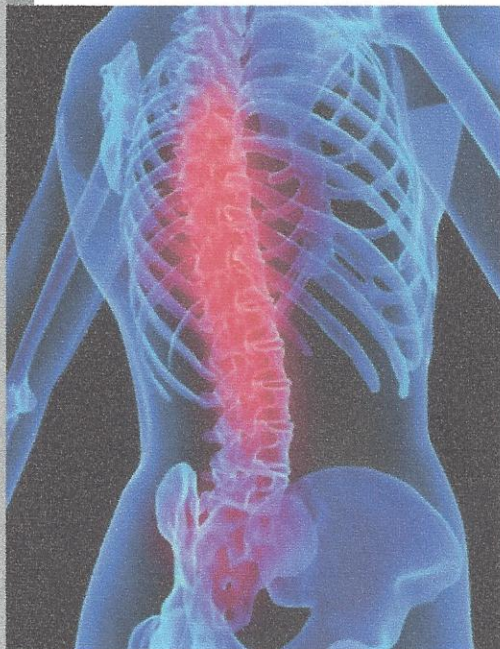
4. Lying on your back and lifting both legs for 10 seconds to test lower abdominal and hip flexors strength

5. Lying on your tummy and lifting up your legs to test your lower back muscle extensors

6. Lying on your tummy and lifting your head and chest to test your upper back extensors

In looking at those 3,700 patients who had pain but no significant pathology, almost all of them failed the test, meaning failure on any one of the six items.

The group at Columbia then put together an exercise program that was specifically created to address the failures on the test. It came down to 21 exercises for the low back. It started with many more, but they eliminated a number of exercises because they would sometimes cause discomfort for the patient. This work was all predicated on being able to do something simple and not pain producing—not requiring any sort of technology with the least amount of resistance for the patient; meaning most exercises are done on your back to avoid gravity. After 4.5 years, the group at Columbia came up with the 21 exercises, which then intrigued the people at the YMCA, who created a program to deliver these specific exercises called



"The Y's Way to a Healthy Back." They delivered it to 300,000 patients with an 80% success rate. The patients in that group who had previously had back surgery had an 82% success rate. The way it was done at the Y originally was twice a week for six weeks.

They also looked at neck and shoulder pain and upper back pain, which also is a major problem. We often overlook the muscles there as well. They came up with eight upper quadrant exercises. A big part of the exercises is relaxing—relaxing has to do with getting rid of tension.

That's incorporated into both upper and lower body exercises. The whole sequence is relax, limber, stretch, and strengthen.

The problem in a lot of exercise programs or sports that you do may not incorporate that sequence. This is especially true for the group referred to as weekend warriors. The tension built up by sitting behind a desk during the week tightens our muscles. We can't wait to get out on the golf course or tennis court to blow off that pent-up energy.

If you quickly jump into any exercise without warming up you're more likely to injure yourself. Any resistance or strengthening exercises done with stiff

muscles will only make those muscles stiffer. Imagine a very pumped up and muscle bound athlete. That's not desirable; too much focus on bulk and strength, but not enough on flexibility and function

The exercise program that Hans created is based on the sequence: relax, limber (which is movement in the range of comfort), stretching after relaxing and limbering, and only then strengthening.

If you stretch before relaxing and limbering, what you're doing is going against a stiff or tense muscle. You're not getting a full, true stretch. If you release the muscle as much as possible prior to the stretch, you'll get a much better stretch.

EP: Are these exercises appropriate for all people?

NM: These exercises are designed for people with low back pain and neck pain. Even if you have an x-ray or MRI diagnosis, that doesn't mean that's the cause of your pain.

If you haven't considered muscles, you can't be sure from where the pain originates. We know that if you take 100 people off the street, 40% of them may have a herniated disc with no pain at all. With that in mind, why does it mean that just because you have a herniated disc, that's from the cause of your pain? It doesn't make sense if we ignore the muscles in the physical exam.

EP: What about those who have suffered for a long period of time? In some of your literature, you mention a muscle softening technique—how does that impact those who have had pain over a long period of time?

NM: Let me give you a really important example. Dr. Kraus was involved at the White House on two occasions. The first occasion was when Eisenhower was president. Dr. Kraus went to Europe and gave the Kraus-Weber test to children in Italy, Austria, Switzerland, and England. He found that 96% of European kids passed

the test. Then he came back and gave it to the same age children in the United States and only 50% passed. Dr. Kraus showed it to Eisenhower, who became very alarmed and started the President's Council on Physical Fitness based on Kraus' findings. The next time he came to the White House was when John F. Kennedy was president. At that time, Dr. Janet Travell was treating President Kennedy for back pain. Dr. Travell was injecting President Kennedy many times a day. Some of his other physicians weren't pleased with this treatment. One of them, his endocrinologist Eugene Cohen, said he'd like his colleague Dr. Kraus to come in. Dr. Kraus took over and stopped injecting him because it wasn't appropriate. President Kennedy had a lot of weakness and stiffness that had been overlooked. Dr. Kraus started Kennedy on the exercises. President Kennedy got much better, and only then could Dr. Kraus see the distinction between the muscles that remained that were trigger point muscles and the other ones that had been helped with the exercises.

The problem that you have is that you can mistakenly attribute all chronic muscle pain or even acute muscle pain as trigger points when you don't have the concept of tension, weakness, stiffness and spasm—those causes would not be well treated by injecting.

I spent 10 hours every Tuesday with Dr. Kraus for five years. He had as much of an impact on my life as Morrie from Tuesdays with Morrie had on Mitch Albom. It was a life altering interaction because he showed me that things I thought were chronic pain and untreatable were not—that they were undiagnosed muscle pain. The way we identified the muscles causing the pain was through palpation and through using a pressure algometer to see if one muscle was much more sensitive to pressure than the same muscle on the other side. We were right a lot of the time but sometimes we were wrong.

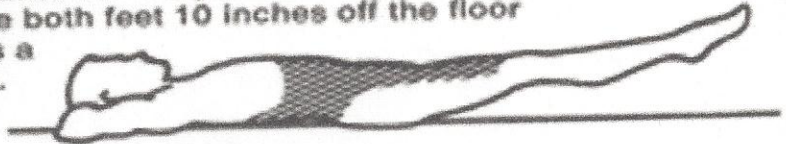
Eventually, I discovered that if I used an electrical device to stimulate muscles that I got a much more accurate assessment of which muscle was actually causing the pain. So that's what we're doing now —

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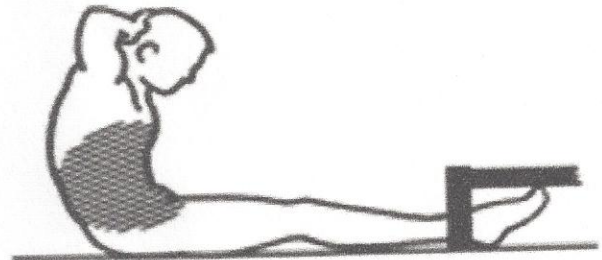
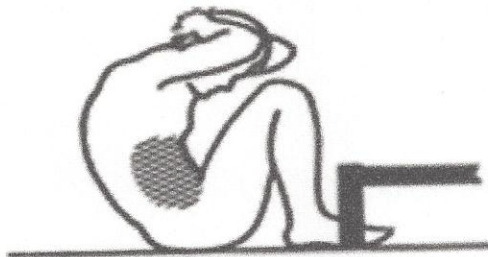
SIX BASIC MUSCLE TESTS

These six standardized tests of muscular function may help to "pinpoint" deficiencies of strength or flexibility (Test 6). They are done as slowly and smoothly as possible. Avoid jerky movements. Do not strain. Stop and rest briefly after each test.

TEST 1. Lie on your back, hands behind your neck, legs straight. Keeping your legs straight, raise both feet 10 inches off the floor and hold for 10 seconds. This is a test of your hip-flexing muscles.



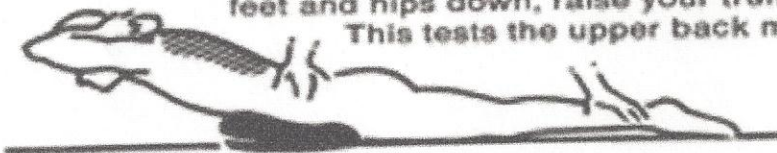
TEST 2. Lie on your back, hands behind your neck, feet under a heavy object which will not topple over. Try to "roll" up to a sitting position. This tests your hip-flexing and abdominal muscles.



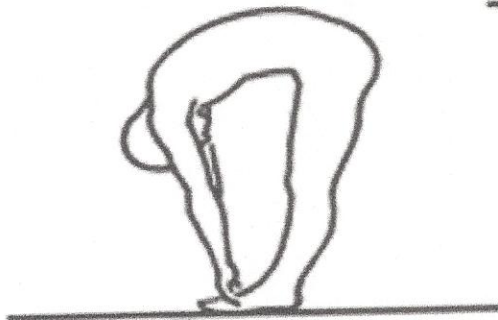
TEST 3. Lie on your back, hands behind your neck, knees flexed, feet under a heavy object which will not topple over. Again try to "roll" up to a sitting position. This is a test of your abdominal muscles.



TEST 4. Lie on your stomach with a pillow under your abdomen, hands behind your neck. With someone holding your feet and hips down, raise your trunk and hold for 10 seconds. This tests the upper back muscles.



TEST 5. Taking the same position as that used for Test 4, but this time having someone holding your shoulders and hips down, try to raise your legs and hold for 10 seconds. This tests the muscles of the lower back.



TEST 6. Stand erect with shoes off, feet together, knees stiff, hands at sides. Try to touch the floor with your fingertips. If you can not, try it again. Relax, drop your head forward, and try to let your torso "hang" from your hips. Keep your knees stiff. Chances are you'll do better the second time. This is a test of muscle tension or flexibility.

we're electrically stimulating the muscles to identify the primary source of trigger point pain. It's very hard to know if the pain of which the patient complains and that you're palpating is primary or secondary, meaning referred pain. With the electrical device, I'm able to do that.

EP: Why do you think this is not widely known or that these series of exercises are not considered as the first treatment intervention?

NM: The community standard for treating muscle pain is based on the mistaken notion that most pain in muscles is from trigger points. Trigger points, tender nodules in muscles that when pressed radiate pain to another site, are only one reason for muscle pain. Muscle deficiency (weakness and stiffness), although increasingly common in an under exercised and overweight population, is a major cause of back pain. Exercise and diet need to be stressed. One problem with many exercises is that they don't address muscle as the cause of pain. This sounds too strange to be true, but it is true. Dr. Kraus and I published the study on the seven exercise protocols in the world literature on back pain. Six of them have nothing to do with muscles. The Kraus/Marcus exercises are the only ones that address muscles as a source of upper and lower back, neck and shoulder pain.

If the number one diagnosis of low back pain is nonspecific back pain, meaning strains and sprains of muscles and other soft tissue, why don't we have some sort of rigorous exercise protocol that we can provide to patients to address muscle generated pain. I suggest that the exercises given to 300,000 people at the YMCA, who took the original Kraus exercises, be offered as a standard part of any back pain protocol. The exercises, slightly modified, are described in my upcoming book, *No More Back Pain*, to be published by Atria Press in the spring of 2011. •

Dr. Marcus is an associate professor of anesthesiology and psychiatry and director of muscle pain research in the department anesthesiology at NYU School of Medicine. He directs the Norman Marcus Pain Institute, where the mission is the elimination rather than the management of pain. He is a past president of the American Academy of Pain Medicine and the author of *Freedom from Pain*.

Call For Stories!

Exceptional Parent magazine wants to help you share your stories. We are currently soliciting articles for inclusion in the **military section** of EP in the following areas.

- **Stress Management:** We are looking for contributors who can discuss how they manage **stress in dealing with the military health care system, their child's disabilities, and deployments.**
- **Mental Health Issues:** We are seeking information about how military families have coped with a diagnosis of **childhood depression related to having a military parent.** Also, we want to know **how veterans deal with the depression associated with Post Traumatic Stress Disorder (PTSD) and other war injuries.** Additionally, we are soliciting stories and articles about **families coping with a diagnosis of moderate to severe anxiety.** Do veterans face anxiety as they encounter treatment for injuries and how does the military help them cope with the anxiety of continued and prolonged treatments?
- **Traumatic Brain Injuries (TBI):** Throughout the year, we plan to continue to tell the stories of **how Wounded Warriors and their families overcome injuries and cope with the lingering issues of TBI.**
- **Assistive Technology:** In July, we would like to find military contributors who will tell stories of **how assistive technology has helped a military child or adult** with disabilities in their daily lives.
- **Prosthetics:** With the current conflicts in Iraq and Afghanistan, many of our servicemembers are returning home with life-changing injuries. We are asking these brave individuals to share their stories of how **the use of prosthetics and other aids** are helping them recover from these injuries and transition to different ways of living at home.
- **The Military Child and War:** Are you a returning vet (or the spouse to one) who has a war-related disability and a young child? Explaining your injury and **"coming home different"** can be a difficult process for a military family. Please share your story on dealing with this aspect of military family life.
- **Sports and Recreation:** In June, we would like to find military contributors who utilize **Sports and Recreational activities for individuals with special needs.**

For more information, deadlines, and questions about these and other story ideas, please contact EP's Military Editor at militaryeditor@eparent.com.