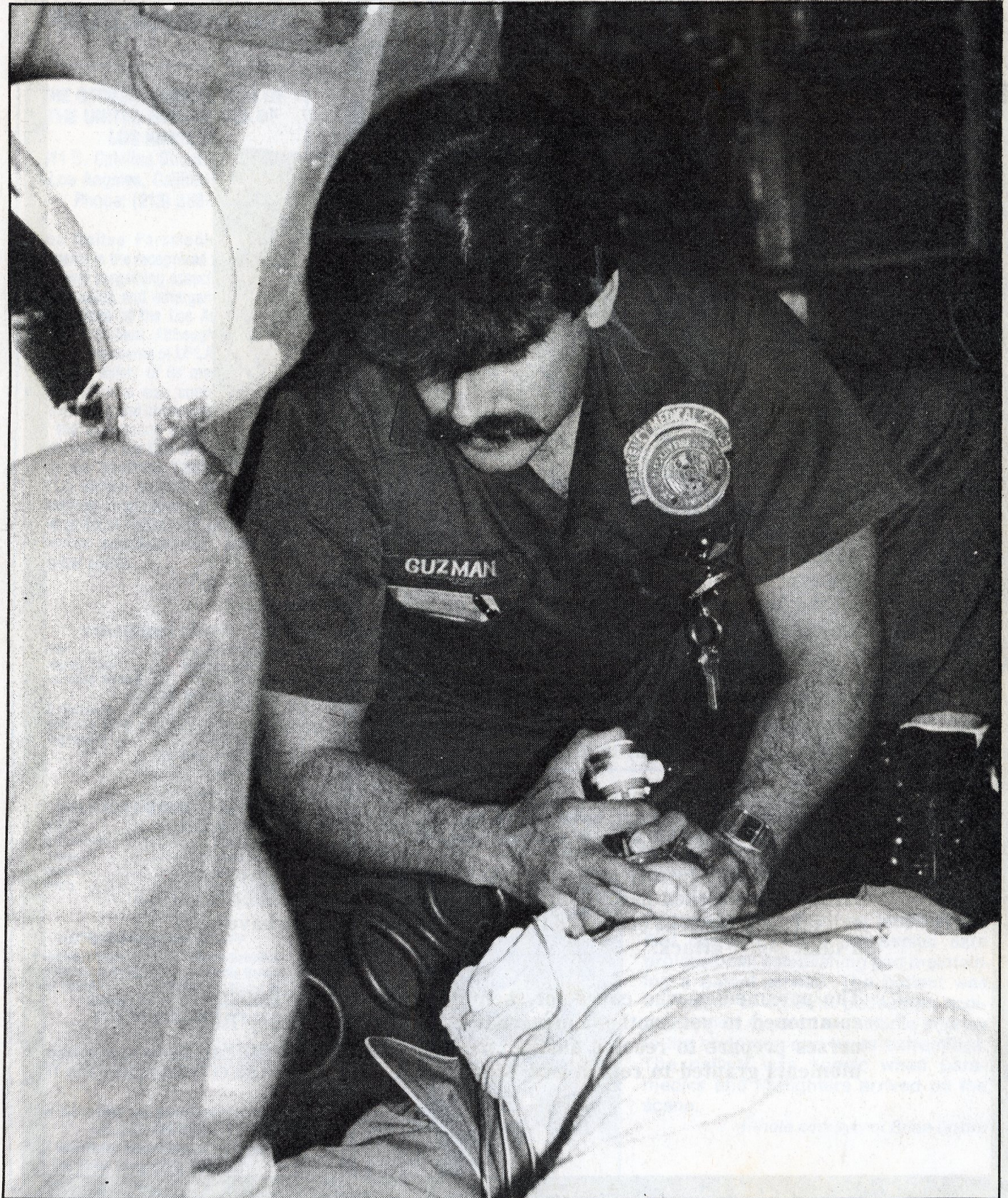


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Paramedic Pains: Low Back Syndrome



Photo courtesy of Rick McClure

**By Alan R. Cowen, MICR
Senior Paramedic, LAFD**

Back pain can be a real headache. Nearly everyone has backache at some time or another, and some people have it continually.

The low back pain syndrome affects more than 90% of the human race at some time during their lifetime; and it has been reported that 80% of low back pain is caused by mechanical strain, the mechanism being either an episode of trauma or a continued strain of postural or occupational variation.

Low back pain is probably the most common complaint in medical practice. Successful treatment does not only involve temporary pain relief, but removal of the cause to avoid recurrences.

GENERAL CONSIDERATIONS

A strain is an overstretching of muscle, tendon, or fascia. This may be caused by overuse, stretching, contractions, or a direct blow. We may further classify strain into grades.

A. Simple Strain (Grade I) —

No major hemorrhages, but a low grade inflammatory reaction with minimal swelling and edema.

B. Moderate Strain (Grade II) —

A laceration of fibers with some hemorrhage into the the surrounding tissues. There is inflammatory reaction with edema, and also muscle spasm.

C. Severe Strain (Grade III) —

This results from a violent incident, where a tendon may be severely stretched or torn from the bone or pul-

led apart (avulsed). The musculotendinous junction may be ruptured, or a muscle torn.

The symptoms are pain and particularly muscle spasm. There is **no** sciatic pain in the leg with a low back strain. The low back muscles commonly involved are the erector spinae group and multifidus.

Treatment for a back strain is important, since they tend to recur. Regulation of a person's activity is of prime importance. Immobilization is the therapy of choice and soft tissue manipulation or stretching should be avoided in the acute stage.

A simple Grade I strain is rarely reported due to minimal distress. Home therapy should include cryotherapy (cold), immobilization, and rest. Symptoms usually subside in 4 or 5 days with adequate treatment. The area of injury should be pain-free in order to resume work.

A grade II strain is the most common, and many are chronic in nature due to previous inadequate treatment.

Grade III strains may require sur-

gical repair. Early recognition is paramount to effective repair.

A sprain is stretching or tearing of ligaments that support and limit the mobility of a joint. Any motion that exceeds the tolerance of a ligament is sufficient to produce a sprain. A sprain may also involve injury to the periosteum, muscles, tendons, and blood vessels, as well as the associated soft tissue.

We may classify sprains as follows:

A. Mild Sprain (Grade I) — Stretching of ligamentous fibers.

B. Moderate Sprain (Grade II) — Some tearing of ligamentous fibers.

C. Severe Sprain (Grade III) — Complete disruption of a ligament, with complete loss of function.

The symptoms are a brief severe pain at the moment of injury, followed by a severe aching pain which can persist for several days, and use of the part may be impossible.

THE LUMBOSACRAL SPRAIN

When the spine is fully flexed, the erector spinae muscle group are total-

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ly relaxed. These muscles do not contract until the back begins to straighten. Thus, when an object is being lifted from the ground, the hips begin to extend before the back, the whole strain being accomplished by the ligaments which are unprotected, and sudden twists, slips, (or patients suddenly moving) may rupture them.

Lumbrosacral sprains are very common to paramedics. Lifting patients can many times create a sprain due to several factors; overestimation of strength by a paramedic leads the list, and improper lifting of patients from sitting or recumbent positions. Stairway carrying creates hazards due to the rescuer bending over as he/she carries the weight, being suddenly caught offguard by a patient rapidly moving or changing position, or getting "short changed" by one's partner. (inadvertantly, of course).

THE INTERVERTEBRAL DISC SYNDROME

The disc, of which there are 23 in number, is made up of white fibrous cartilage placed in a circular band-like fashion called the Annulus Fibrosis. These bands surround the nucleus pulposus, the matrix. Both of these, plus the cartilaginous plates make up the disc.

The disc is bound anteriorly and posteriorly by the longitudinal ligaments, and is attached to the plates by very strong fibers. (Sharpey's fibers are said by some to be the strongest fibers found in the body.)

The shape of the disc is like the shape of the vertebra upon which it sits; it is slightly convex and in the cervical and lumbar regions, it is thicker in front than it is in behind.

The following represent the functions of the disc:

1. shock absorber,
2. aids in formation of spinal curves,
3. helps with movement of vertebrae,
4. assists in maintaining the proper size of the intervertebral foramen and,
5. helps hold the adjacent center of the vertebrae together in their proper alignment.

The nucleus pulposus is a very strong ball-bearing like substance under hydrostatic pressure and is completely surrounded by the annulus fibrosis.

It is interesting to note that there is a microscopic nerve supply and pain fibers in the posterior aspect of the

disc which also extend into the posterior longitudinal ligament. This is a reason for pain on motion when a disc protrudes or bulges.

ETIOLOGY OF THE IDS (Intervertebral Disc Syndrome)

There appears to be two general causes of the low back IDS. The first is repeated small trauma, or microtrauma. These are small tears that take place in the disc. The average person subjected to them usually has a stiffening and soreness in the low back. Most doctors would attribute them to strain or sprain. These areas heal and fill in with fibrotic tissue, repairing, yet leaving a weakened area. It is of paramount importance to realize that heavy trauma is **not** necessary to experience a complete rupture of the nucleus pulposus through the annulus fibrosis into the root canal. (ruptured disc).

The second cause of IDS is dehydration. The human disc begins a normal aging process when it was formed. Repairing processes are slow due to a lack of blood supply. When dehydration occurs, the integrity of the disc is lessened and the elasticity is reduced, permitting the nucleus pulposus easier migration through the annulus. This process is enhanced by degenerative changes.

PATHOLOGY OF THE IDS

What occurs when the nucleus begins to break through or breaks through? First, edema enters the disc and surrounding tissues, causing pressure on nerve roots, whether there is a disc protrusion or complete herniation.

Secondly, hemorrhage has been found on sections of discs that have been removed, and thirdly, fibrotic deposits occur. Finally, dehydration of the disc in adolescents results in adolescent kyphosis (abnormal posterior curvature); in the adult as spondylosis and senile kyphosis.

Intervertebral Disc Syndromes more frequently occur after age 35, and are most common from 40-45 years of age. It is more frequent in men than women. The majority of disc syndromes are found at L5-S1 and C5-C6 levels of the spinal column.

DIAGNOSIS

The lay person most often calls this a "slipped disc" (impossible), but the nucleus slips within the annulus. The term "herniated disc" is used widely

by many physicians, but it is not a true description from clinical findings. Such a diagnosis would require direct visualization in surgery. However, a description of symptoms/signs based on history, radiographic studies, orthopedic and neurological findings is the proper approach to an adequate diagnosis. It has been estimated that 90% of the diagnosis can be obtained from a complete history.

CLASSIFICATIONS OF IDS

IDS — Protrusion

Grades I, II, III with or without paresthesia and/or radiculitis (Inflammation of a nerve root.)

A. GRADE I PROTRUSION

1. Patient will usually show an antalgic position;

2. Low Back Pain particularly at 30° flexion. Pain may be to and including the sciatic notch in the buttocks;

3. Straight leg test may be positive (orthopedic test).

4. May or may not have history of prior injury;

This test is performed with the patient supine and the extended leg is flexed on the trunk at the hip by the examiner. Pain in the low back on the affected side is considered a positive test.

B. GRADE II PROTRUSION

1. More noticeable antalgic position; movement will affect pain by the patient;

2. A "C" scoliosis (curvature of the spine) with muscle spasm of the erector spinae group;

3. Lumbar Kyphosis (reduced lordotic curve);

4. Reduced range of motion in flexion with severe pain at 30° flexion; there also may be pain on lateral bending of the affected side;

5. Sciatic Nerve Pain with or without parasthesia (abnormal sensation);

6. Positive Straight Leg test with abnormal Achilles Reflex and;

7. History of Low Back Problems.

C. GRADE III PROTRUSION

1. All of grade II, but more severe;

2. Severe antalgic position; Pain in any position. May drag a foot;

3. Parasthesia in L5-S1 as far down as the foot, or even to toe. If L4-L5 are involved, the great toe will be involved;

4. Achilles Reflex diminished or absent. If L5-S1 involvement difficulty in standing on toes; if L4-L5 involvement, inability to stand on heels.

NOTE: It is clinically not possible to differentiate between a herniation and

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a Grade III protrusion. Myelography may well be suggested.

X-RAY STUDIES

X-rays do not show a disc involvement. X-rays are used to determine whether or not other conditions are present involving bone or soft tissue. Radiographs may reveal a narrowed disc space showing previous degeneration or dehydration, but this a matter of differential diagnosis. Narrow disc spaces or degenerative discs not necessarily indicate IDS.

SYMPTOMS OF ACUTE IDS

Pain may be slight, severe, or even absent. Pain is usually sharp, continuous, and usually is unilateral of a sciatic distribution. Pain may be confined to the sciatic notch or in the low back. Pain may change from sharp stabbing to dull aching in nature.

Paresthesia or hypoasthsia may extend to the feet. Severe muscle spasm will be present usually in the erector spinae group. Muscle spasm may later localize at the spinous processes of the disc level involved. A reduced range of motion, particularly in flexion and lateral bending to the affected side will be evident. Percussion over the spinous processes will elicit pain at the level involved, especially with obese patients.

CONDITIONS FOR

DIFFERENTIAL DIAGNOSIS

Intervertebral Disc Syndromes must be differentiated from compression or any fracture of a vertebra, iliolumbar ligamentous strain, Sacroiliac problems, myositis, pelvic organ disease, Osteomyelitis, Prostatic CA, Metastatic CA, Cauda Equina Syndromes, Spinal Cord Tumors, TB of the spine, Ankylosing Spondylitis (Marie Strumpell's disease), Spondylolisthesis, and Malingering (phonies).