The failed back syndrome is an imprecise term used to categorize a heterogeneous group of patients who share only residual symptoms after ineffectual therapy. The alternative, postlaminectomy syndrome, serves little useful purpose because it inaccurately describes the patient’s surgical treatment. Members of diagnostic subgroups may be as divergent as the unfortunate patient who suffers from a cauda equina syndrome secondary to an improperly performed operation to the patient whose psychosocial problems are more important than any physical abnormalities in mediating the complaints.12, 17, 20

The first step in understanding patients who complain of back and leg pain that is unresponsive to treatment must be individualization with accurate determination of physical abnormalities and medical, social, and psychologic factors that may mediate the complaint.31 Once an appropriate diagnosis is made, a logical, sequential treatment plan tailored to the abnormalities and needs of the individual patient can be devised.38 The development and implementation of this treatment plan is the key to appropriate management. Stereotyped treatments applied without regard to specific underlying physical factors and associated mediators can be guaranteed to fail.40 Only comprehensive evaluation and treatment for all aspects of the pain and dysfunction are likely to benefit a significant number of these individuals.

**CAUSES OF LOW BACK PAIN**

One of the problems that the clinician faces in dealing with these complex patients is that, for most, the cause or causes of pain cannot be defined.40 To provide both diagnostic and therapeutic sequences, it is necessary to understand what structures in the back generate pain and what can be done to improve these abnormalities.

Potentially, all of the components of the vertebral functional system could be painful.29, 40 Afflictions of the skin do occur, but no such patient has appeared in our series. However, pain from abnormalities of muscles, fascia, and ligaments is well understood and clearly important. Myositis, fasciitis, and bursitis have all been described in back pain sufferers both with and without surgery. Instability of the spine is another well-accepted cause of pain. When substantial abnormal movement occurs, pain is generated. Compression of neural elements is another phenomenon recognized to cause pain. Abundant clinical evidence indicates that acute nerve root compression causes immediate pain.3 Removal of that compression consistently relieves pain. Instability is accepted as a cause of pain.41
Beyond these simple mechanical explanations of pain, a number of theoretic considerations have been proposed, mostly supported by association with a complaint of pain or patient response to therapy. Lumbar discs degenerate, and some patients with degenerated discs complain of pain.\(^1\) Pain fibers found in the annulus fibrosus are thought to explain the complaint of pain in patients with lumbar disc degeneration or bulging without nerve root compression.\(^65\)

Lumbar zygapophyseal joints become arthritic. Arthritic joints elsewhere in the body are painful.\(^58\) It is logical that arthritic facets may cause pain. Some patients have relief of back pain after temporary or permanent blockade of the innervation of these joints. The facet syndrome is generally, but not universally, recognized as a potential cause of back pain and nondescript radiation. Some patients with simple disc bulge without obvious nerve root compression are relieved by intradiscal injection of lytic agents, by percutaneous discectomy, or by surgical discectomy with interbody fusion. This suggests that some abnormality of the disc was important in the generation of pain.

Micromovement is another frequently proposed explanation for the generation of pain. This concept is based in part on the observation that some patients who are not relieved following successful posterior fusion can be improved by anterior discectomy and interbody fusion, thus leading to the hypothesis.\(^55\) A nonmechanical theory suggests that chemical substances elaborated by the degenerating discs are pain producing. These chemical substances are not identified, but their presence remains a justification for discectomy and fusion, particularly in the cervical region.

In the postoperative patient, the situation is more complex.\(^8\) All postoperative patients have scar. Some postoperative patients have residual pain. When the two occur together, it is common for physicians to explain the pain by the presence of the scar. This is logical when the scar is obviously compressive and some evidence suggests that removal of a postoperative scar, which is producing a mass effect, is beneficial. Many patients have diffuse epidural adhesions that do not compress nerve roots. The association of these epidural adhesions with pain is inferential only.

It has been postulated that traction generated by the epidural scarring is a reasonable explanation for pain, but if this is so, why all postoperative patients do not have pain remains unexplained. Intradural scarring or arachnoiditis is frequently seen in postoperative myelograms and in its lesser degrees is not associated with pain routinely. Patients with severe arachnoiditis often complain of pain, but it is not known how many such patients without complaints exist.\(^7\)

In spite of these uncertainties, it is necessary to define all of these abnormalities potentially associated with pain to produce a logical treatment plan.

**CLINICAL EVALUATION**

**History**

The historical examination is more important than physical findings in most patients.\(^38\) The historical examination should include the details of the problem before any intervention. A description of the surgery done is of interest, but it only occasionally relates directly to the therapeutic plan. The most important part of the history is an understanding of the patient's personality vulnerabilities and the comorbidities.\(^9, 21\) The history should include a careful examination of education, and vocational, personal, and social function.\(^30\) Past and current drug use as well as substance abuse are very important. The factors that typify personality dysfunction should be explored in detail. Many patients will not give accurate answers to questions that relate to social and vocational dysfunction on a first visit, and the questions should be repeated over time or asked in different ways.\(^54\)

The history of the pain is important. One must establish the location of the pain and its character. Pain that is only in the back suggests local problems, whereas radiating leg pain with a radicular character always suggests root irritation or injury. Most patients without significant psychologic mediators describe pain in matter-of-fact terms.
Failed Back Surgery Syndrome

that conform to anatomic localizations. Florid descriptions of the pain, which exaggerate its severity and do not conform to accepted anatomic distributions, are always suspect. Patients with psychologic abnormalities routinely use words filled with emotional content to describe their pain, whereas patients without these comorbidities rarely do.⁶⁰

Another important aspect is to determine whether the patient’s disabilities conform to the physical problem. It is important to know exactly what patients can and cannot do. Discrepancies between vocational function and personal social function are common. A skilled clinician can examine all of these questions in indirect ways to determine if the history of disability is consistent, believable, and commensurate with the physical abnormalities found.

Physical Examination

The diagnostic value of the physical examination is not great. Obviously, it is important to record the physical abnormalities present, but generally they do not relate to pain in any significant way. These abnormalities are important in determining physical disability.

Examination of the incision is important. A poorly closed incision with gaps in the lumbar fascia is often painful. Areas of fascitis and myositis can be found. Remember that these conditions may exist not only locally in the area of the surgery but also at the origins and insertions of affected muscles. Patients usually recognize this and point out areas of local tenderness.

Range of motion is emphasized by agencies that determine disability. Actually, little evidence indicates that range of motion relates to anything of significance. Most forward bending occurs at the hips. Limitation of range of motion is nonspecific, and the pain report entirely subjective. Examination for associated muscle spasm at least substantiates the patient’s statement about pain, but recording the actual range of motion is of little value.

Many experts in the field believe certain generalizations. Relief of pain by bending forward and exaggeration of pain by hyperextension are said to suggest spinal stenosis. Pain on rotation or lateral bending is a sign of facet joint disease. Although commonly repeated, these observations remain expert opinion and have never been substantiated in any controlled way.

Examination of the hips is included as a part of the routine evaluation. Little evidence suggests that hip disease mimics these problems of spondylosis. Occasionally, hip disease produces sciatica.

The physical examination should include an assessment of strength of the lower extremities emphasizing individual muscles or groups, knee and ankle reflexes, and a radicular sensory examination. These evaluations establish the presence or absence of neurologic abnormalities but bear no relationship to pain.

Probably the most important part of the physical examination is observation of the patient during the various maneuvers. The patient who is exaggerating usually gives evidences of that exaggeration. Reflexes may be deliberately accentuated. The patient may not exhibit much willful effort in strength testing. The patient may have a normal gait or normal heel and toe stand but weak voluntary effort with plantar flexion and dorsiflexion. Sensory abnormalities vary and do not follow anatomic distributions. Many patients will go through contortions that require considerable strength and agility to demonstrate how they are unable to walk or perform some particular test. Straight-leg-raising tests will vary with position.

During all of this, the patient’s behavior is extremely important. Moaning, groaning, grimacing, and such accentuated pain behaviors are common. These signs have been capsulized by Waddell and coworkers,⁶⁰, ⁶¹ and although they have never been validated with regard to treatment outcome, they are used by virtually all expert clinicians to reflect a psychologic component to the physical examination.

The physical examination serves to substantiate complaints of weakness and sensory loss. It is probably more important to determine if the examination is consistent with the complaints than to try to correlate
specific abnormalities with pain and disability. The emphasis placed on range of motion and measurement of extremity circumference in disability determination is unproven. The clinician learns more from the behavior of the patient before, during, and after the examination than from the specific abnormalities that are discovered.

**DIAGNOSTIC ADJUNCTS**

A number of new studies have supplanted the standard myelogram in the evaluation of the low back cripple. To make a rational decision about which studies to use, one must understand what they show.\(^7, 39, 53\)

**Plain Films**

*Weight-bearing Films.* Anteroposterior, lateral, oblique, and lateral roentgenograms with flexion-extension are still important. These films demonstrate only bony anatomy. Nothing else is seen with consistency. Disc space narrowing, facet joint arthritis, and instability all can be assessed. Natural or surgical pars defects, occult fractures, and the extent of surgery also can be determined. Soft tissues are not seen well, and normal spine films do not preclude a significant soft-tissue abnormality.\(^24, 36\)

**Computed Tomography**

The computed tomographic (CT) scan has revolutionized evaluation of the spine.\(^26\) No other study demonstrates bony anatomy as well.\(^57\) Muscles can be assessed and disc protrusions are frequently seen. However, the CT scan is not very good for delineating disc pathology or for differentiating postoperative changes from recurrent or retained disc herniation. Intradural lesions are not seen well.

*CT with Intrathecal Contrast.* The myelogram has been replaced by CT scanning with dilute, intrathecal, water-soluble contrast agents. The added contrast allows the intrathecal contents to be seen in great detail and also improves the assessment of extradural compressive lesions.

**CT with 2- and 3-Dimensional Reconstructions.** Multidimensional reconstructions of CT scans greatly improve the ability to assess spinal and foraminal stenosis. The 3-dimensional reconstructions are rapidly becoming the standard for the assessment of bony detail. The addition of soft tissue reconstructive techniques is another improvement, which has the potential to replace CT myelography. The reconstructions currently are principally useful to delineate bony detail.

**Magnetic Resonance Imaging**

Magnetic resonance imaging (MRI) demonstrates soft tissues better than any other imaging modality. The detail now approaches anatomic dissection. Bony anatomy is not seen well, and stenosis is underestimated consistently. However, the configuration of the disc, disc herniations, intradural structures, and the surrounding soft tissues are delineated with great precision. With postoperative patients, it is still difficult to differentiate scarring from recurrent disc herniation. This technique also does not differentiate the truly herniated disc from the bulging, thickened ligament-bony osteophyte combination with certainty.

The major problem with all of these techniques is that the anatomic details, which can now be defined with great accuracy, do not necessarily correlate with symptoms. Degenerative disc changes, midline protrusions, and degenerative bony changes are seen in asymptomatic patients. At present, a combination of appropriate pain description, physical findings, and imaging is required to identify the abnormalities that are important.

At present, I use plain films first to be certain that no important unsuspected abnormality exists. CT with 3-dimensional reconstruction and MRI in combination are usually adequate to define the pathology. In some circumstances, these studies are not satisfactory, and CT myelography is still required. Increasingly, this situation is the exception.
Electrophysiologic Studies

Much has been written about the utility of electromyography and the various associated studies in the diagnosis of low back problems. I do not find these tests to be of much value. Success rates varying from 20% to 90% have been reported for accuracy of determining root compression. Generally, these claims have been unsubstantiated by controlled outcome studies. No correlation has been found with outcome of surgery, only with surgical findings. To be useful, tests of this kind would have to replace imaging studies or add significant and useful information often enough to warrant the expense. This utility has not been proven.

In the complex patient who has undergone multiple back operations, the abnormal findings of electromyography are even more difficult to decipher. The abnormalities may be secondary to original disease, surgical trauma, or ongoing compression. Negative findings are of more use than abnormalities. Normal findings on electromyogram in a patient who professes significant weakness or who has atrophy from disuse rather than neural origin can be helpful; but studies for these purposes are rarely indicated.

Thermography is another confirmatory test that has been correlated with root compression. However, the success rate is not high enough in identifying root compression to warrant routine use, and abnormalities following multiple surgeries are so common that their presence does not help in the differential diagnosis.

Diagnostic Blocks

A variety of temporary anesthetic blocks have been used to try to determine the origins of pain in these patients. Blockade of individual nerve roots, blockade of lumbar zygapophyseal joints, and intradiscal injections all are commonly utilized. Epidural or spinal anesthesia has also been employed to determine if any peripheral procedure will be helpful to the patient’s pain. In spite of a voluminous literature on the subject of peripheral blocks, their diagnostic utility remains in doubt.

Individual root blocks often relieve pain. The issues are specificity and prediction. Even with careful fluoroscopic control and the injection of relatively small amounts of anesthetic agent, it is difficult to be certain that the anesthetic has not spread and anesthetized more than the individual root.

The meaning of pain relief following root block is even more complex. Successful pain relief after blockade of an injured or irritated root may indicate a local process. However, nonspecific reduction in peripheral input is another potential explanation. This reduction in sensory input may bring about a temporary change in the central pain mechanism, but it does not predict that pain can be successfully relieved by a peripheral procedure. The failure of rhizotomy and the more specific dorsal ganglionectomy suggests that relief of pain by the most specific peripheral block does not predict success of any peripheral procedure in producing long-term pain relief.

Some patients have back pain as a result of diseased zygapophyseal joints. Blockade of these joints or their innervation will relieve back pain in some patients. The issue of specificity is again important. Even the most careful block is associated with some spread of the anesthetic agent. Block of the medial branch of the posterior primary rami with very small amounts of anesthetic agent improves specificity. However, predictability is still a problem. Surgical and percutaneous destruction of the medial branches of the posterior rami are commonly done, but few controlled studies to assess their value are available. Intra-articular injections are employed, but no controlled studies have been done to evaluate their utility.

It seems logical that carefully controlled injections of small amounts of local anesthetic into the joints or their innervation producing local blockade may have specificity in indicating the involvement of the zygapophyseal joints in pain production. That is, if pain is completely relieved by these blocks, then it is probable that at least a component of the underlying problem is originating in the joints. Nevertheless, the problem of specificity exists, and the predictive power of the blocks has not been proved by
controlled outcome studies after facet de- 
nervation.

Discography is an old technique more or 
less outmoded by the new imaging modali-
ties. The diagnostic discogram—that is, in-
jection of a contrast agent into the nucleus 
pulposus—was originally devised to iden-
tify a degenerated or herniated disc. Discog-
raphy was used instead of or to supplement 
myelography. It was based on the hypothe-
sis that the degenerated disc, particularly 
when the degeneration was severe enough 
to be accompanied by defects in the annu-
lus, was sufficient to cause pain. Dissec-
tomy, chymopapain injection, and interbody 
fusion have all been based on the abnormal 
discogram.

MRI now defines all of the discs with a 
small error rate. Correlation of MRI appear-
ance with carefully controlled discography 
has not been done, but it is probable that 
MRI is as accurate. Some reports indicating 
abnormal discography in the presence of ap-
parently normal MRI scans have appeared, 
but the data included in these reports are 
inadequate to assess their relevance. Diag-
nostic discography is not used widely now, 
but it is still employed by some individuals 
who are considered expert in the field.

Anesthetic discography is now much more 
in vogue. This is also an old technique and 
has been employed for many years. Valida-
tion of its specificity and predictive power is 
not available from controlled studies.

The hypothesis is that the injection of an 
anesthetic agent into the nucleus pulposus 
should first, reproduce the patient’s pain and 
second, relieve the pain. In practice, a diag-
nostic discogram is usually done, and both 
the amount of material and the ease with 
which it can be injected into the disc are 
recorded. Abnormal discograms are often asso-
ciated with extravasation of the contrast 
agent through defects in the annulus.

Reproduction of the patient’s pain with 
the injected contrast material is thought to 
be important. A small amount of anesthetic 
material is then injected. Presumably, the 
anesthetic material follows the same path as 
the contrast agent. Relief of pain is the ulti-
mate positive test, although reproduction of 
pain is also important.

A positive test suggests to some that re-
moval of the disc and interbody fusion will 
eliminate the patient’s pain. As yet, no con-
trolled observations are available to indicate 
that this attractive hypothesis is correct. 
Clearly, a degenerated disc does not neces-
sarily correlate with patient complaints of 
back or leg pain. Whether the anesthetic dis-
cogram is a predictor of those patients with 
painful disc degeneration remains to be 
proven in controlled studies.

LOGICAL EVALUATION OF THE LOW 
BACK INVALID

As previously discussed, the evaluation 
begins with a thorough historical examina-
tion, which focuses on the description of 
pain and the believability of that descrip-
tion. The history of the treatment of low back 
pain is important. The historical examina-
tion should include items that illuminate the 
patient’s psychosocial status and history as 
well. The physical examination is useful to 
identify local muscular, fascial, and liga-
mentous abnormalities. The neurologic sta-
tus can be accurately determined. Exagger-
ated behavior during the examination is 
often as helpful as the findings of the exami-
nation itself.

Imaging should begin with plain films that 
are weight bearing and include flexion-
extension. When high-quality CT scanning, 
particularly with 3-dimensional reconstruc-
tion, is available, it is satisfactory for as-
essment of bony detail. MRI has largely 
supplanted myelography. The combination 
of these three studies is adequate to define 
the anatomy for most patients.

When questions remain, CT myelograph-
y may be required. MRI and plain CT must be 
used in combination to provide adequate 
imaging for most of these patients. The CT 
myelogram can be used as the single study 
needed. It is unnecessary to do all of these 
examinations. Combinations of studies 
should be used to answer specific questions 
concerning the pathologic anatomy. When 
these questions are answered, no more stud-
ies need be done.

Electromyography and thermograph: 
contribute little to the evaluation of these 
patients. The electrophysiologic studies are 
generally employed when an associated pe-
ipheral neuropathy is a strong possibility.
Thermography is used principally when a reflex sympathetic dystrophy syndrome secondary to neural injury is suspected. Occasionally, the electromyogram may be used to validate a suspected root compression syndrome that cannot be proven by imaging; otherwise, electromyography does not influence treatment decisions, is costly, and therefore, is not used routinely in our evaluations.

Diagnostic blocks have limited use as well. Blockade of specific roots may occasionally be necessary when there is a discrepancy among complaints, physical findings, and imaging abnormalities. Facet blockade is employed in patients with a mechanical back syndrome for which movement, significant arthritis, or both can be demonstrated at these joints. Destruction of the innervation of the joints has been employed for nearly 20 years but has not been validated by controlled studies. Expert opinion suggests that it is useful in a very limited number of patients with specific abnormalities of the zygapophyseal joints.

At this point, anesthetic discography is not routinely used in our evaluations. Evidence suggests that the concept is worthy of specific study, but until controlled studies are available, this procedure cannot be considered effective or routine. For most patients, a combination of history, physical examination, and appropriate imaging studies is sufficient to make a diagnosis and to generate an opinion concerning the mediators as well as the generators of the complaint.

**THERAPY**

Following satisfactory diagnosis, the goal of treatment is to provide the patient with a logical, sequential treatment plan directed at all those factors that are individual problems. Stereotyped approaches are unlikely to succeed, and individualization is the key to best outcome.

**Importance of Comorbidities**

Whatever the underlying abnormalities, it is important to identify and treat the mediators of the complaint. The chronic pain syndrome is typified by depression, anxiety, and disability beyond that expected from the neurologic abnormalities. All must be identified, if present, and treated.

Many of these patients use drugs inappropriately. Drug use must be strictly controlled, and those who are addicted or habituated should be withdrawn from offending medications. Narcotics and psychotropics are the most likely drugs to produce significant withdrawal symptoms. Detrimental pain behavior must be corrected, and psychosocial issues, particularly those that relate to vocational status and litigation, also need attention.

In the usual treatment scheme, patients first have anatomic abnormalities corrected; only after this correction is attention paid to the factors that produce comorbidity. I believe that this process should be reversed. I favor beginning with treatment of depression using tricyclic antidepressants. The patient should be withdrawn from narcotics and potentially addictive psychotropics. If pain behavior is inappropriate, then an inpatient program dedicated to the modification of behavior may be necessary. Direct, practical assistance with psychosocial issues is important. An honest evaluation and straightforward presentation of the disability situation to the patient and legal representative can be helpful. The best unbiased medical opinion concerning disability is more important than the advocacy the patient and lawyer often desire. Once the factors of comorbidity have been addressed, the next step should be to implement the nonoperative therapies that may be beneficial for the individual. So-called conservative care is time honored in its use, but it actually has very little scientific support. A few studies suggest that the modalities employed may be beneficial, but the effects of conservative care are not well documented. The best data come from intensive programs that focus on musculoskeletal abnormalities.

It is important for the patient to have a sequential program, which is individualized to correct the specific problems and which is monitored to ensure compliance. In the usual situation, the patient is told to lose weight, a back brace is ordered, and the patient is sent to a physical therapist for rou-
tine application of passive modalities, such as heat, massage, traction, and ultrasound. The cost of this therapy is enormous and its value is unproven. The goals of nonoperative care should be specific and should be defined by the treating physicians. The program must be monitored before it can be concluded that the treatments have failed. Virtually all patients should undergo a treatment program of this kind before further surgery is undertaken. Specific abnormalities may not respond to nonoperative treatment, but most patients should exhaust the conservative measures before surgery is contemplated.

A logical, sequential program begins with weight reduction if the patient is obese. This task is probably the most difficult one for the patient. Few patients will reduce weight without professional assistance.

The next step is the identification of painful local areas of myositis, fasciitis, and bursitis. These problems may seem trivial, but they can be extremely painful and very disabling. Many measures are employed. Application of heat or cold, transcutaneous electrical stimulation, ultrasound, injection of local anesthetics or steroids, cold, and injection of neurolytics all have their advocates. Vigorous local massage and stretching can be very effective. The treatment of these local processes requires a skilled therapist who can both locate and eradicate the abnormalities.

The following step is an adequate exercise program. The exercises should include stretching; range of motion of the low back, hips, and lower extremities; and strengthening exercises for the back, abdominal muscles, and lower extremities. The process must be gradual because many of these people have significant pain secondary to chronically contracted muscles. A number of mechanical aids are now available to exercise specific muscles. Computer-assisted programs are common, and many systems that are both complex and expensive have been advocated. No evidence indicates that these programs are superior to traditional exercise programs. Furthermore, little evidence indicates that these exercises reduce pain, although it is clear that they can improve function.

The next step following successful restoration of functional capacity should be a similar program for the actual functions themselves. Patients are specifically trained for self-care, recreation, and duties at home or at work. In an ideal system, those patients who are capable of returning to work would have appropriate jobs identified and then be specifically educated for their performance. In practice, this rarely happens.

Several problems exist. Many physicians do not understand the specific nature of the treatments involved and simply order physical therapy without much attention to the patients. Therapy programs with grandiose names are widespread, but only a few offer a comprehensive, sequential treatment plan. Patient compliance represents a substantial barrier. Weight control is difficult for all but the most motivated. It is not easy to change lifelong habits to engage in a regular exercise program. Many of these patients have serious personality dysfunction. All spheres of their life are disturbed, and there is no reason to believe that they will be logical and rational in this one.

It is the complaint of pain that is disabling for virtually all of these patients. When the patients state they cannot participate in the rehabilitation program because of pain, no way exists to disprove this claim except by demonstration of malingering. Litigation is an important negative. In my experience, no patient with litigation pending ever improves until that litigation is finished. It is not likely that a patient whose disability payments require ongoing pain is going to improve by any therapy.

Employers and health insurance carriers represent an equally large obstacle to appropriate treatment. In my experience with more than 4000 of these patients, my general impression is that these agencies consistently approve fragmented, ineffectual, and inappropriate standard treatments while resisting efforts at a logical, sequential program. They consistently seek out physicians whose opinions will consistently coincide with their desire not to spend more money on the particular patient. Virtually no states have adequate programs for vocational training for patients who are truly disabled from previous employment.

None of these negatives should dissuade the physician from a thorough evaluation,
which includes assessment of both physical and psychologic aspects of the patient’s problem, followed by a comprehensive treatment program, which is designed to restore maximum function. The majority of patients do not need more.

**Comprehensive Pain Treatment Center**

Because the many needs of these patients encompass several specialties, the pain treatment center has evolved. Those which are acceptable are multidisciplinary and multimodal, and combine accurate diagnosis with comprehensive treatment. Because pain has become a popular area of focus, it is not surprising that many programs without the requisite multidisciplinary skills have appeared. Few individual physicians can provide everything these complex patients require, and most choose to refer patients to these pain centers. Much ineffectual care is evident in our patients.

Remember when choosing a program that it should include the following: medical personnel sufficient to the diagnosis; diagnostic capabilities; psychiatric-psychologic skills and capability of diagnosis and treatment of comorbidities; physical rehabilitation measures; assistance with social issues; capabilities for disability determination; and the ability to synthesize all of these factors into a sequential treatment program. A few such centers with proven records exist and should be the model for new efforts in this demanding field.

**SURGERY IN THE FAILED BACK SYNDROME**

Some of these patients have underlying disease states that are amenable to a surgical procedure. The goal of the presurgical evaluation is the most accurate diagnosis possible so that treatment including surgery can be made as specific as possible. My hypothesis is that only nerve root compression and instability can be corrected by operation. Demonstration of one of these two problems in patients with commensurate symptoms and signs who do not have comorbidities that make surgery undesirable should identify a group of patients who can be benefited by reparative surgery.

The first step is to identify the abnormalities that are found in these patients. For patients who have a physical abnormality that seems likely to explain the pain complaint, a group of potentially correctable abnormalities can be defined (Fig. 1). The most common condition is spinal stenosis—congenital or acquired. It may involve the entire spinal canal, the lateral recess, or the neural foramina—individually or together (Fig. 2). The typical patient has undergone one or more discectomies and continues to have radicular pain. The imaging studies, particularly 3-dimensional CT, demonstrate compression of the nerve roots in the lateral recess, beneath overgrown articular processes, or in the neural foramina (Fig. 3).

The second common problem is a residual focal mass deforming one or more nerve roots. It is always difficult to determine if this is retained disc, recurrent disc, or simply postoperative scar. Of course, combinations are possible. In my experience, it makes little difference what the focal mass is. The important issue is the presence of a mass that compresses a nerve root. Patients with recurrent or retained disc fragments do not seem to do better than those with compressive masses of scar. These patients must be differentiated from those who simply have an adhesive scar. The issue is the compressive nature of the mass.

The other large category of correctable problems is those that relate to instability. The instability may be due to a straightforward problem, such as spondylolisthesis (degenerative or acquired). Surgical disruption of joints may be found, or the process may be more subtle with a combination of degenerative disc disease, incompetent ligaments, and movement of articular processes (Fig. 4).

Among the entities that are not amenable to surgical correction, the most common are adhesive epidural scar, intraneural scarring, degenerative disc disease, and arachnoiditis. Disc space infection is a rare but extremely important cause of the syndrome. Other surgical complications, such as pseudomeningocele, may be involved.

Occasionally, a straightforward entity has
simply been missed. In my experience, the most common of these is the truly lateral herniated disc. Intraspinal tumors, symptomatic arachnoid cysts, and paraspinal pathology are now much easier to diagnose with existing imaging techniques, and it is probable that these entities will be found regularly now.

Concepts held by some experts in the field have not yet been proven. Many surgeons believe in the concept of micromovement. In this theory, tiny amounts of movement are thought to generate pain. Even solid posterior fusion may be accompanied by pain generated from the anterior column. According to this hypothesis, it is necessary to completely immobilize the patient posteriorly and anteriorly to achieve pain relief. The concept has not been tested in any rigorous way. This explanation is also used as one explanation for the generation of pain in the patient with disc degeneration.

Other attempts have been made to explain pain from disc degeneration. The mechanical theory holds that the soft bulging disc stretches or tears the annulus and generates pain from annular fibers. This explanation is used to validate both discectomy and fusion. Others hold that the pain is chemical in origin. Some factor released by the degenerating disc is thought to produce pain from surrounding structures. This argument is used as a rationale for radical discectomy and anterior or posterior interbody fusion. These hypotheses and the value of the treatments based on them remain opinion. No controlled studies exist that support them.

**Surgical Procedures**

Many variations of the operations done to provide decompression and stabilization have been described. No data suggest that one technique is better than another. The goals of surgery are identification of the specific areas of root compression and their elimination. It makes very little difference how the decompression is accomplished. However, the decompression should retain
as much normal spinal anatomy and function as possible. If the compression is only foraminal (Fig. 5) it is unnecessary to do complete laminectomy, which is required if canal stenosis is present. Foraminotomies should be performed, leaving the zygapophyseal joints intact whenever possible. No reason exists to explore asymptomatic areas. The decompression should be thorough and radical. For patients who do not do well, it is incumbent upon the surgeon to prove that the decompression was accomplished.

The issue of stability is even more complex.30, 32, 43, 44 When movement is obvious on films, there is no problem in deciding when to fuse. However, when movement is less obvious, the question of whether fusion is indicated is very difficult to decide. Earlier, spine surgeons tended to use a stereotyped approach of one or two discectomies followed by fusion in all patients who failed to improve. Now, no excuse can be made for this lack of surgical judgment.

The decision to fuse is still uncertain in the absence of substantial spinal movement. A trial of immobilization in a well-fitted body jacket is helpful.22 Patients who receive excellent pain relief from this kind of immobilization potentially are candidates for fusion. Combined internal/external fixa-

Figure 2. There is typical spinal stenosis seen immediately above the level of a fusion. There is slight posterior listhesis and the spinal canal is narrowed secondary to ligamentous overgrowth.

Figure 3. A and B, The CT scan demonstrates a significant disc bulge at the level of previous surgery. The right zygapophyseal joint has been disrupted. The patient was treated by discectomy and posterolateral fusion. Pain relief has been satisfactory.
Facet block and intradiscal anesthetic injections are used by some to choose patients who may benefit from fusion. At present, it is more often clinical judgment rather than demonstrated instability that indicates fusion for many patients.

Enormous diversity exists in the types of fusions employed.\(^{41}\) The broad spectrum of internal fixation devices available for the lumbar spine speaks to the lack of superiority of any of them. Posterior and posterolateral fusion with and without internal fixation are common techniques. Posterior radical disc excision and posterior interbody fusion are used by a smaller number of experts. Fewer use retro- or transperitoneal exposures for radical discectomy and anterior interbody fusion.

All of these techniques have major shortcomings.\(^ {46, 51}\) All distort the functional anatomy of the spine and stress joints above and below points of fixation. A large percentage of patients retain some symptoms related to the spine, and actual failure of fusion occurs in at least 10%.

Many of the experts in the field report excellent results with one or more of virtually all the stabilization procedures available. However, the lack of accepted criteria for determining outcome and the fact that the patients are all individually selected make it very difficult to generalize. Experienced spinal surgeons are able to choose individual patients who can be benefited by complex operations. The factors that predict successful outcome, however, remain unknown.

Reparative surgery is of value for a select group of patients who have failed previous operations. The need is most obvious when the original procedure failed to correct an underlying abnormality. Ongoing root compression is another indication, and demonstrated instability is a logical reason for fusion. A larger number of patients with complaints that seem to be mechanical in nature may be candidates for one of the many stabilization procedures now available, but how to recognize these patients and which operations to apply are still open questions.

The outcome of reparative surgery is difficult to judge.\(^ {15, 23}\) Several specific operations are reported to have better than 90% success. My experience with any type of reparative surgery has been less successful. For nearly 5 years, the Johns Hopkins Spine Service has undertaken reparative surgery based on the hypothesis that most patients with demonstrated root compression or in-
undertaken. A comprehensive, postoperative rehabilitation program is important to maximize outcome of surgery.

Spinal Cord Stimulation

When further reparative surgery is not an option, my next alternative is spinal cord (dorsal column) stimulation. Stimulation of the spinal cord for pain control is now more than 20 years old. The initial enthusiasm over the technique was followed by a predictable wave of disenchantment. Since that time, spinal stimulation has been more limited to experts in the pain field. Improved equipment and better understanding of indications for the technique have combined to improve results greatly.

It has been common practice to employ spinal stimulation after failure of reparative surgery. Increasingly, we offer spinal stimulation as an alternative to reparative surgery. The technique is simple and safe, and has a success rate that is at least as good as corrective surgery and may be better. The patients currently chosen are those with definable anatomic abnormalities that are not clearly correctable. Patients with arachnoiditis are the largest group chosen.

All patients are given a trial of epidural stimulation using a temporary electrode system and an external stimulating source. Those that achieve satisfactory pain control undergo implantation. This preliminary testing coupled with greatly expanded hardware and software systems, which allow multiple electrode combinations and a wide spectrum of stimulation parameters to be tested, have improved the success rate to between 60% and 70% of those implanted. Lack of adequate stimulation in the painful part is the most common reason for failure. Equipment failures still occur. In spite of stringent screening criteria, mistakes in patient selection are made.

The selection of patients is key to the technique. As stated, the first criterion is a definable physical problem to explain the pain. The technique is never employed in the patient who complains of pain without associated physical explanations. Patients are carefully screened for the comorbidity factors known to be important. When there is
any question concerning the patient’s readiness for treatment, inpatient comprehensive pain treatment is recommended.

Patients who continue to take large doses of narcotics or psychotropics are not candidates for the technique. Stimulation is certainly not a panacea, but it provides satisfactory pain relief for a significant number of otherwise untreatable patients.

Thalamic Stimulation

Brain stimulation is almost as old as spinal cord stimulation for pain control. The technique has always been a tool for experts in both pain management and stereotactic surgery. In our experience, it is relatively rare for a patient with failed back syndrome to accept the possibility of thalamic stimulation for pain control. Most of those who do suffer from the arachnoiditis syndrome. Nerve root injury pain is the other condition that produces pain severe enough for the patient to consider thalamic stimulation.

To choose patients who will undergo the procedure, we use similar criteria to those employed for spinal cord stimulation. The patient must have a physical abnormality competent to cause the pain problem. All comorbidity aspects must have been completely evaluated, and all members of the pain therapy team must be convinced that thalamic stimulation is warranted.

Drug use, anxiety, and depression are all treated, and the pain treatment program is exhausted before thalamic stimulation is considered. Given the fact that the patients chosen are refractory to all other forms of therapy, the 60% reported success rate is reasonable. Deep brain stimulation should be considered in those patients with the most serious and otherwise untreatable low back problems.

ADJUNCTIVE THERAPIES

A variety of treatments have been proposed for the failed back syndrome that are nonspecific and unproven by controlled studies yet are widely employed. The fact that they are unproven does not mean they are not effective. It does mean that the data available are inadequate to prove effectiveness. These treatments are used on the basis of expert opinion in much the same way that physical measures are employed. However, they do not have the same restoration of function rationale as physical therapy, stretching, and exercise.

Manipulation Therapy

A number of experts believe that manipulation is useful treatment. Local measures are valuable for the treatment of local inflammation, but the general role of manipulation therapy in the treatment of the chronic back sufferer has not been tested by controlled trials. This criticism is equally true for the more traditional exercise and activity programs employed to treat these patients. However, the lack of controlled studies in one area does not excuse their lack in another.

Prolotherapy

The injection of hypertonic agents in the back is another technique that has had limited use for years. Some experts suggest that the technique may be of value. However, the physiologic basis for relief is uncertain. The factors that indicate this form of treatment are not known with certainty, and most of the usage has been in an uncontrolled fashion. No data are available that indicate when the treatment should be used in the failed back syndrome.

Steroid Injection

Steroid injection for pain relief in acute disc herniation is reasonably well documented, although it is unclear that this relief changes the eventual outcome significantly. The use of epidural steroids in the failed back syndrome has not been validated. Placebo-controlled trials have suggested that epidural steroids with and without the addition of narcotics have no more than a placebo effect. Personal operative experience with a large number of patients who have received epidural steroids before sur-
surgery indicates that significant epidural scarring accompanies their injection. The epidural scar is similar to that seen with surgery.

**Intrathecal Narcotic Administration**

Experience is limited with implantable pumps for the delivery of intrathecal narcotics to relieve pain in the failed back syndrome. A few surgeons have performed these operations. Reported series are not yet available for review. However, anecdotal evidence from a number of experts in the field suggests that these patients do not achieve lasting pain relief.

**LATE COMPLICATIONS OF BACK SURGERY**

The most serious late complication of back surgery is arachnoiditis. The causes are still unclear. Contrast agents used for myelography certainly produce arachnoiditis, although the incidence is extremely low. Water-soluble contrast agents are less likely to do so than the oil-based agents used in the past. Subarachnoid hemorrhage produces the problem as does infection. The majority of patients who develop significant adhesive arachnoiditis have had a combination of myelography and usually more than one surgery. It is virtually impossible to implicate one or the other alone in most instances. Nor is there an explanation for why some patients undergoing multiple myelograms and surgeries develop arachnoiditis, whereas the majority do not.

Debate also exists concerning the clinical symptoms that accompany the problem. Many patients have mild degrees of arachnoiditis seen on imaging studies without significant symptoms. In comparison, severe adhesive arachnoiditis, which is associated with blockade of spinal fluid, subarachnoid cyst formation, and calcification in the thickened arachnoid, does produce a predictable pattern of symptoms. Most of these patients have a claudication syndrome. Their legs weaken and pain is increased with walking or standing. They are slowly improved by rest. The pain is usually bilateral, diffuse, and burning in character. It sounds more like the pain of polyneuropathy than of radiculitis. In a small number of patients, an associated progressive paraparesis occurs in which loss of bowel and bladder function is prominent.

The cause of the pain is undetermined; therefore, treatment is nonspecific. One theory for the pain suggests that the traction on the roots that are adherent to the dura produces the pain. Use of a back brace, which limits bending, is sometimes helpful.

Occasionally intrathecal steroids are of great benefit in improving symptoms. Episodic administration is required. However, steroids are not definitely approved for this purpose, and others have strong opinions against their use. Because the disease is otherwise virtually untreatable, the continued investigation of the utility of steroids in symptomatic arachnoiditis is warranted. The best data available support steroid use. Systemic steroids are also beneficial. However, the long-term consequences of high-dose steroid use must be considered.

Radical surgery with microlysis of the intradural adhesions has been utilized in a small number of patients. My own series includes more than 50 such procedures in approximately 25 years. My initial experience indicated that pain relief occurred in no more than 50% and that the significant complication rate (usually bowel or bladder dysfunction) was as high as 15%. Spinal cord stimulation is better for pain relief, and the operation is no longer done for pain. However, in the small number of patients with progressive neurologic deficit, relief of the block and lysis of adhesions is a very effective treatment. Virtually all of the patients have had stabilization of a previously progressive neurologic deficit, relief of the block and lysis of adhesions is a very effective treatment. Virtually all of the patients have had stabilization of a previously progressive neurologic deficit, and almost half have had significant improvements in neurologic loss. Unfortunately, bowel and bladder control recover infrequently.

**CAUSES OF THE FAILED BACK SYNDROME**

In this article, I have considered the failed back syndrome within the medical model. That is, I have assumed there is an underlying potentially correctable physical cause,
attributed the pain to that cause, and then
discussed the treatments available. The
comorbidity factors require that behavioral
and cognitive models be employed, but they
are less important than the underlying medi-
cal causes in this way of thinking.

I have used this approach deliberately be-
cause this is the way most physicians think
about back pain.\(^4\) Strong evidence
suggests that this way of thinking actually
produces a significant part of the prob-
lem.\(^19\) Behavioral and cognitive/affective
aspects of the chronic pain disability
syndrome should be considered simulta-
neously with the medical model.\(^33\) Patients
should not be deprived of an accurate physi-
cal diagnosis, but the physical diagnosis
should not obscure the fact that important
psychosocial factors must be considered in
any overall treatment plan.\(^50\)

In a review of nearly 500 patients suffer-
ing from chronic pain, we discovered that
psychologic factors were much more impor-
tant than physical factors in maintenance of
the chronic low back syndrome. Review of
these data is worthwhile to understand the
complexity of the problem.

Of the 266 patients requiring admission to
our multidisciplinary chronic pain treat-
ment program who fell in the general cate-
gory of failed back syndrome, 15% had pri-
mary psychiatric diagnoses evident before
the low back problem began. Endogenous
depression was the most common diagnosis,
and somatiform disorder was second most
frequent. Of these patients, 55% were
thought to have a personality dysfunction
that predated the back complaints. This per-
sonality dysfunction was judged to be the
cause of disability. Serious premorbid psy-
chiatric problems were absent in only 30%
of the total group.

Overall, these patients had undergone an
average of nine myelograms and six opera-
tions each. Virtually all were taking narcot-
ics and psychotropics. Most were overusing
these drugs, and over half had withdrawal
symptoms to some medication.

A retrospective review of all previous
studies done was possible in a smaller num-
ber. About one third of the patients met clin-
ical and imaging criteria usually accepted
for spinal pathology before the initial pro-
cedure. Most were operated upon for a com-
plaint of pain. After the second operation, all
subsequent procedures were for some com-
plication of surgery.\(^38\)

It appears that the most common cause of
the failed back syndrome is failure of patient
selection. Review of data on more than 2000
failed back patients suggests the following
scenario.\(^34\)

The typical patient has a work-related ac-
cident and complains of acute back pain.
Spontaneous onset of pain occurs but is less
common. The original examinations do not
reveal any evidence of structural injury or
neurologic deficits. The patient says that he
or she cannot work. Conservative care,
which usually consists of passive physical
therapy, fails, and the patient begins the liti-
gation process seeking total disability for an
injury that cannot be identified.

Several years go by in which the patient’s
existence is focused on the back pain and its
treatment. Multiple consultations with dif-
ferent physicians and much ineffective
treatment is undertaken. Repetitive imaging
studies are common. It is not unusual for a
patient in this category in our series to have
seen between 10 and 15 specialists over a 2-
to 3-year period; to have undergone as many
as 20 MRI, CT, and myelogram studies; and
to have had several hundred physical ther-
apy treatments.

In one informal review in which we traced
costs of five consecutive patients, the aver-
age cost of the conservative care in the first 2
years was $26,000. The patient is then oper-
ated on without meeting accepted historical,
physical, or imaging criteria for surgical in-
tervention. The need for surgery is based on
the complaint of pain in combination with
imaging abnormalities that are not necessar-
ily related to the pain complaint. When the
first surgery fails, multiple repetitions are
common. Our average patient now has had
three operations. Depression and anxiety
usually follow the failed surgical proce-
dures. Overuse of medication is usually
present before surgery.

Review of our extensive data suggests that
the fundamental failure of this care system is
the lack of appreciation of the underlying
personality vulnerabilities of these patients.
Of such patients, 70% have either a clear
psychiatric diagnosis or a personality dys-
function that borders on personality disor-
Disability in these patients appears to relate to the psychiatric and psychologic dysfunctions rather than the physical abnormalities. This finding does not mean that these unfortunate patients cannot have major physical disabilities. They often do, but many of those without psychologic dysfunction continue to work and are not incapacitated.

**HOW DO WE SOLVE THE FAILED BACK PROBLEM?**

Specific studies are lacking, but review of our large data base suggests that a series of causes can be addressed to reduce the numbers of these patients.

One possible explanation for failure of surgery is an inadequate diagnosis, which led to an incomplete operation. The most typical example is the patient who has disc herniation associated with significant spinal stenosis (Fig. 6). Removal of the disc does not alleviate bony compression of the nerve root, and radicular pain persists. At one time, there was an enormous preoccupation with the herniated disc as the principle cause of back and leg pain. As imaging has improved, our understanding of the complexities of the abnormalities that produce symptoms has increased. Current imaging techniques allow precise definition of abnormalities. Correlation of these abnormalities with complaints and the use of definitive procedures to correct the abnormalities are now more possible than ever before.

Another possible cause of failed surgery is an inadequate operation. The diagnosis may have been correct but, for one reason or another, the abnormalities were not eliminated by the surgical procedure. This seems to be a relatively rare cause of failure of spinal surgery. A missed disc and exploration at the wrong level are the most likely causes, and both are relative rarities. Inadequate foraminotomy is probably more common, but it is extremely difficult to define postoperatively.

A third possible cause is a major complication of surgery. All surgical patients have adhesive scars. Why some patients develop symptoms while most do not is unknown. The relationship between epidural scarring and pain is uncertain at best (Fig. 7). Other kinds of abnormalities include arachnoiditis, nerve root injury, disc space infection, pseudomeningocele, and induced instability.

The use of fixation devices has added a new dimension to this postsurgical failure group. Some of the techniques for metallic fixation produce a stiff spine, which is virtually always painful. The devices may be misapplied and may produce pain from root compression. Neurologic injury can accompany the insertion of any of these systems. It has been our experience that any of these systems can become loosened with time, and this is a frequent cause of severe local pain. Pseudarthrosis can develop with any fusion, although the relationship between pseudarthrosis and pain is not always obvious.

These surgical problems are important to recognize and correct. A specific group of patients are greatly benefited by spinal surgery. It is incumbent upon the surgeons to employ the best possible diagnostic images to identify the problem to be corrected; to employ the best surgical techniques to correct them; and to do this with minimum complications. These statements may sound like platitudes, but in a field that is changing...
as rapidly as spinal surgery, it is important to stay current without adopting every passing vogue.

If our data can be universally applied to depict the problem accurately, the greatest advances are to be made in improved patient selection. Avoiding surgery in patients with psychologic dysfunction who do not have clearly defined physical abnormalities that correlate with the pain complaints should eliminate two thirds of the surgical failures. It does not follow that these patients can be rehabilitated by existing therapies, but at least ineffective surgery would not add to the disability and the expense. Understanding the importance of psychosocial factors in pain and disability coupled with stringent criteria can do more than anything else to reduce the magnitude of the problem of postlaminectomy syndrome.

The patient with known comorbidities and significant anatomic abnormalities with appropriate, related pain complaints poses a difficult problem. The existence of psychosocial comorbidity greatly reduces the potential for a good outcome from surgery. However, it does not seem humane to deprive a patient of indicated treatment because of this comorbidity. Ideally, these patients must have both issues addressed. Attention to psychosocial issues without correction of an underlying problem is not likely to produce an ideal result, whereas surgery without the other supports required by these patients is unlikely to provide rehabilitation.

**SUMMARY**

The failed back or postlaminectomy syndrome is obviously multidimensional. Failure of therapy may result from structural abnormalities in the back, psychosocial influences, or a combination of both. The causes of back pain are largely unknown. Correlations with diagnostic studies are uncertain. The lack of precise diagnoses is reflected in a multiplicity of nonspecific treatments, mostly of unproven value.

Our current disability-litigation system adds greatly to the problem. Patients are rewarded for nonfunction. Some physicians become advocates for patients, others for insurance carriers and employers. Decisions concerning appropriate treatment are often made by patients, attorneys, the disability determination system, employers, and judges for extraneous reasons, which include financial gain or personal bias and often reflect lack of current information. Even when correct decisions are made, there is a lack of adequate programs for diagnosis and comprehensive treatment of these individuals.

The failed back syndrome is not likely to
Failed Back Syndrome

appear quickly. Large numbers of these patients require care. The best available evaluation includes thorough, but not overly minute investigation using the best current imaging techniques. These studies combined with the history and physical examination should provide a reasonably accurate assessment of the patient’s condition. Concomitant evaluation of psychosocial issues is mandatory, and those who treat these patients without understanding the importance of the various comorbidities discussed are likely to be detrimental.

Reparative surgery has real, but limited use. Nerve root compression and instability are the only two conditions demonstrated to be correctable at the present time. However, even when a potentially remediable lesion is found, these patients should undergo a reasonable attempt at physical rehabilitation with attention to both local factors and general function.

The best data available today suggest that most of the patients suffering from failed back syndrome are incapacitated by psychiatric, psychologic, and social/vocational factors, which relate to the back complaint only indirectly. Those currently suffering from this problem can be best treated by comprehensive programs that address these complex psychosocial issues. New additions to this category can be reduced by rigorous attention to physical abnormalities, so that surgery is undertaken only for clear indications, and appreciation of the importance of the psychologic aspects of disability from low back pain. The smaller group suffering principally from physical abnormalities can be improved by reparative surgery or pain-relieving procedures if intensive conservative rehabilitative efforts fail.

All surgical procedures fail occasionally, and as long as there is a need for reparative surgery, some patients will fail to benefit or be worsened by the procedures. Our goal should be reduction of this figure to the minimum currently possible by selection of patients most likely to benefit from the proposed procedures and a concerted rehabilitative effort that offers assistance with the complexity of problems many of these patients have. We must avoid making these problems worse through hopeful surgery, improper use of medications without understanding their side effects, and failure to deal with the depression and anxiety that accompany chronic pain and disability. Strict attention to all of these factors will improve our ability to deal with the post-laminectomy syndrome.

Only elucidation of the actual causes of low back and leg pain and the development of treatments specific to those causes can produce the answers we need to totally solve this problem. Even if these answers were available, the current disability litigation system would make it impossible to help a substantial proportion of the patients. Until an up-to-date understanding of the medical problem is introduced into the disability system, it is probable that many of these patients will remain disabled, not by their low back problem, but by a combination of their psychologic vulnerabilities and the comorbidity of the legal system.

Failed back syndrome is a useless term and postlaminectomy syndrome only describes a group of people linked, not by underlying pathology, but by the fact that they have failed a specific treatment. An immediate goal should be the definition of specific syndromes within this obfuscating general diagnosis. Once the diagnoses are individualized, specified logical treatments can follow.

The role of the physician in evaluating and treating these patients must first address this specific diagnosis. Specific diagnosis is followed by the development of a comprehensive, logical, and sequential treatment plan with the following goals: elimination of pain, restoration of function, and rehabilitation. Anything less is likely to fail.

A few spinal surgeons work in a system that provides everything these patients need. Nevertheless, it is the responsibility of the surgeon to make recommendations and referrals for complete evaluation and a treatment program cognizant of all the needs of the patient. In the failed back syndrome, the failure is more in the treatment than in the back. As physicians responsible for the care of patients with low back complaints, we must make certain that the treatment is improved and that the suffering and cost of this largely preventable condition are reduced to the minimum.
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