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Guide to Pain Management in Low-Resource Settings

Chapter 27
Chronic Nonspecific Back Pain

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Case report 1

A 27-year-old chemical engineer who has had back pain for about the past 10 years was referred for physiotherapy. He reported with a recent radiograph, which showed no serious pathology aside from straightening of the lumbar lordosis. Pain is constant but is relieved with rest; it radiates in a nonradicular pattern into the upper limb. The patient has taken a series of periodic medications, particularly analgesics, with no lasting modulation of pain. The back pain is often exacerbated in attempts to get up from a lying position to a sitting position, and often the patient has experienced pain around the waist. On questioning, the patient complains that carrying heavy loads has damaged his spine. He had the first episode of acute pain at the age of about 16, when he carried a 50-kg keg of water (about 100% or more of his body weight at that time). The pain subsided after taking medication, but he has not been completely free of the pain since then. The pain has been undulating in intensity, and he has continued to live with it, but he has seen a doctor occasionally for medication. Now he explains that he has come to the teaching hospital in Ile-Ife, Lagos, Nigeria, to have his pain treated "once and for all," and, he says, "even it requires surgery."

On examination, the pain is axial around L3–L5, not referred and nonradicular. The X-ray shows no degenerative disk disease. When he lies supine on a table there is no pain, and Lasègue's sign (straight leg raising in supine position) is negative. He can perform an abdominal curl (sitting up from the supine position) without pain. With the patient prone, Ely's test (hip extension with a straight knee) is negative, and back extension does not elicit pain. Thus, there is no evidence of disk herniation, facet-joint osteoarthritis, or lumbar spinal stenosis.

The patient is rather disappointed that the doctor does not prescribe a strong pain killer or propose a surgical intervention. He is not really taken with the extensive explanations on the structure and pathomechanics of the spine. The education of the patient involves using a plastic model to demonstrate correct lifting techniques (not exceeding 70% of body weight) and correct sitting posture, while at the same time explaining the extraordinary functional reserves of the spinal column. The patient is advised to use a portable back support for his car and for chairs with poor ergonomic design, but to avoid extended rest and not look after himself too much. When leaving the consultation room, the patient—as could be seen—was not fully convinced, and nobody expected to see him again. Interestingly, he came back a few days later for his scheduled "education consultation" and was now less demanding about invasive procedures but was asking for more advice on the etiology and the prevention of back pain. He seemed to have a high motivation for changing his attitudes and behavior, with an overall positive approach to the future. He was satisfied after

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the attention he received, and he left with the hope of becoming pain free afterwards. In a phone contact later his condition was reviewed. He was radiant on the phone. He expressed gratitude and stated that he has been feeling a lot better. He has been rigorously carrying out the exercises prescribed and has been obeying the prophylactic instructions without any exacerbation of the waist pain. Given that this is not the case in many patients with the same pain syndrome, this news was very encouraging for the therapists as well.

Case report 2

A 71-year-old pharmacist (Papa) had been on conservative management for back pain for about 3 years. The regime of treatment, aside from the earlier, occasional, analgesics, had been back extension exercises, spinal manual treatments, thermotherapy, and education on the care of the back. Though a pharmacist, Papa had not resorted to symptomatic use of medication for his chronic back pain. Sometimes pain would radiate to the posterior thigh, which may be "referred pain" from the facet joints or the iliosacral joint.

A significant achievement in the course of treatment was that his pain usually subsided lying down in either a supine or prone position. Papa was therefore advised to have a table in his office in an adjacent portion of his office. He was advised to lie on the table at his midday break from work for continuous decompression of intradiskal pressure. He complied very well.

However, back pain was preventing Papa from walking very far. He was advised to use a lumbar corset (appropriate for patients with instability who do not have access to stabilizing surgery) and elbow crutches for partial weightbearing on the lumbar and lumbosacral joints. The orthesis and the walking aid eliminated his back and posterior thigh pain. However, he started going out less as he became anxious about using the walking aid and orthosis, purely for cosmetic reasons. He confessed that he had often felt embarrassed by people staring at him or asking him about the walking aids. He complained and felt that more could still be achieved to stop his pain without the use of the corset and elbow crutches.

In late 2006, his children invited him to go abroad for medical treatment. Besides initial medication, after diagnosis of lumbar instability with considerable spondylolisthesis, he underwent surgery for spinal fusion at the level of L4/L5. When he came back to Nigeria, after about 10 weeks, he was free of pain but still had movement restrictions. His condition has been stable since then. His local doctor (his son) saw him with a radiant smile—pain free during walking and without any symptoms in his back and thigh. Papa returned to his work immediately and still observes the midday practice of lying supine for 30 minutes at his office.

This case report illustrates not a typical "nonspecific back pain patient" but a "specific pain" due to functional spinal stenosis caused by spondylolisthesis. While conservative techniques are desirable, nonpharmacological techniques are recommended, such as exercise therapy, behavioral therapy, and education on the care of the back and on compliance with the use of rehabilitation aids. Otherwise, specific interventions, including surgery like the one described above, can bring long-lasting relief from back pain. Differentiating between nonspecific back pain (which is very frequent) and specific back pain (which is rare) is crucial to avoid making nonspecific back pain worse with interventional techniques and analgesics, and to avoid unnecessary suffering in patients with specific back pain needing local—and sometimes invasive—therapy as well as analgesics to improve.

Why is chronic back pain so important?

Chronic nonspecific back pain is very common. Few of us never have back pain; most people have periodic back pain and some have chronic back pain. Chronic back pain is mostly located in the lumbosacral and posterior neck region.

In industrialized countries, low back pain (LBP) is the most common cause of activity limitation in persons younger than 45 years. It is defined as pain in the low back that persists longer than 12 weeks. Although acute LBP has a favorable prognosis, the effect of chronic LBP and its related disability on society is tremendous. For example, approximately 80% of Americans experience LBP during their lifetime. An estimated 15–20% develop protracted pain, and approximately 2–8% have chronic pain. Every year, 3–4% of the population is temporarily disabled, and 1% of the working-age population is disabled totally and permanently, because of LBP. It is estimated that the costs of LBP approach $30 billion annually in the United States.

Why is the "6-week rule" is so important?

Most normal connective tissues heal within 6–12 weeks unless instability or malignant or inflammatory tissue destruction is present. Therefore, in any prolonged back pain, these pain etiologies should be ruled out. Pain that radiates to the legs in a radicular pattern should be thoroughly investigated, especially if sensory or motor deficits are noted in the patient.

If the pain etiologies mentioned above are ruled out and the back pain persists, how should the pain should be interpreted?

Overinterpretation of CT or MRI findings should be avoided. Although disk protrusions have been popularized as causes of LBP, asymptomatic disk herniations on CT and MRI are common even in young adults. Furthermore, there is no clear relationship between the extent of disk protrusions and the degree of clinical symptoms. Therefore, other causes for persistent LBP have to be taken into consideration. If diagnostic studies reveal no structural cause, physicians and patients alike should question whether the pain has a psychosomatic, rather than purely somatic, cause. Physical and nonphysical factors, interwoven in a complex fashion, influence the transition from acute to chronic LBP. The identification of all contributing physical and nonphysical factors enables the physician to design a comprehensive approach with the best likelihood for success.

Is low back pain a worldwide problem?

Disability because of LBP has reached endemic proportions, with enormous socioeconomic consequences, in industrialized societies. Studies indicate that the prevalence of LBP is not as dependent on genetic factors that could predispose persons of specific ethnicity or race to this disorder. Men and women are affected equally. But lifestyle may be one of the most important predisposing factors for LBP. Therefore, LBP is starting to become a major health care problem in all countries in which economic and cultural changes are transforming their societies to modern industrialized societies for the benefit of their citizens.

When is periodic back pain "normal" and chronic back pain "not normal"?

The lumbar spine can support heavy loads in relationship to its cross-sectional area. It resists anterior gravitational movement by maintaining lordosis in a neutral posture. Unlike the thoracic spine, the lumbar spine is unsupported laterally. The intervertebral disks are composed of the outer annulus fibrosis and the inner nucleus pulposus. The outer portion of the annulus inserts into the vertebral body and accommodates nociceptors and proprioceptive nerve endings. The inner portion of the annulus encapsulates the nucleus, providing the disk with extra strength during compression.

The nucleus pulposus of a healthy intervertebral disk constitutes two-thirds of the surface area of the disk and supports more than 70% of the compressive load. Until the third decade of life, the gel of the inner nucleus pulposus is composed of approximately 90% water; however, the water content gradually diminishes over the next four decades to approximately 65%. Until the third decade of life, approximately 85% of the weight is transmitted across the disk. However, as disk height decreases and the biomechanical axis of loading shifts posteriorly, the posterior articulations (facet joints) bear a greater percentage of the weight distribution. Bone growth compensates for this increased biomechanical stress to stabilize the trijoint complex.

Therefore, to some extent, hypertrophy of the facets and bony overgrowth of the vertebral endplates constitute a normal physiological reaction to the age-dependent degeneration of the disks to stabilize the spine. Only in patients with inadequate "self-stabilization" do these changes contribute to progressive foraminal and central canal narrowing. Spinal stenosis reaches a peak later in life and may produce radicular, myelopathic, or vascular syndromes such as pseudoclaudication and spinal cord ischemia. LBP is most common in the early stages of disk degeneration and "self-stabilization."

What types of pain may be identified?

Specific pain

Back pain that lasts longer than 3 weeks with major functional impairment should be thoroughly evaluated to identify serious causes, especially malignant diseases

(e.g., bone metastasis), inflammation (e.g., spondylodiskitis), instability (e.g., spondylolisthesis), or local compression (e.g., spinal or foraminal compression). It has to be repeated that generally the proportion of back pain patients with specific pain is rather low (around 5%). On the one hand, the pain causes mentioned above should never be overlooked, but on the other hand, overinterpretation of radiographic results should be avoided.

As a rule of thumb, unrelenting pain at rest should suggest a serious cause, such as cancer or infection. Imaging studies and blood workup are usually mandatory in these cases and in cases of progressive neurologic deficit, too. Other historical, behavioral, and clinical signs that should alert the physician to a nonmechanical etiology will require diagnostic evaluation.

Evidence for specific back pain might be the following diagnostic "red flags":

- Colicky pain or pain associated with visceral function (or dysfunction).
- History of cancer or fatigue, or both, and weight loss.
- Fever or immunosuppressed status.
- History of older age and osteoporosis (with increased risk of fractures).
- Progressive neurological impairment, or bowel and/or bladder dysfunction.
- Severe morning stiffness as primary complaint.

Nonspecific pain

Evidence for nonspecific back pain might be the following diagnostic "red flags" (nonorganic signs and symptoms):

- Dissociation between verbal and nonverbal pain behaviors.
- Use of affective pain descriptions.
- Little pain modulation, with continuous high pain intensity.
- Compensable cause of injury, out of work, seeking disability (conflict of interest between compensation and wanting to be cured).
- Signs of depression (having difficulty falling asleep, waking up early in the morning, loss of interest, and loss of energy and drive, especially in the first half of the day) and anxiety (continuous worrying and restlessness).
- Psychoactive drug requests.
- History of repeated failed surgical or medical treatments.

Diskogenic pain

Many studies have demonstrated that the intervertebral disk and other structures of the spinal motion segment can cause pain. However, it is unclear why mechanical back pain syndromes commonly become chronic, with pain persisting beyond the normal healing period for most soft-tissue or joint injuries. Inflammatory factors may be responsible for pain in some cases, in which epidural steroid injections provide relief. Corticosteroids inhibit the production of arachidonic acid and its metabolites (prostaglandins and leukotrienes), inhibiting phospholipase A_2 (PLA_2) activity. Levels of PLA_2, which plays a role in inflammation, are elevated in surgically extracted samples of human herniated disks. Furthermore, PLA_2 may play a dual role, inciting disk degeneration and sensitizing annular nerve fibers.

Radicular pain

Surprisingly, the pathophysiology of radicular pain is unclear. Likely etiologies include nerve compression because of foraminal stenosis, ischemia, and inflammation. Often, the cause of radiculopathy is multifactorial and more complex than neural dysfunction due to structural impingement. In clinical practice, structural impairment is usually considered to be responsible, if inflammation is found. Therefore local epidural, often para-radicular, steroid injections are used for therapy, although their long-term effect is rather questionable.

Facet-joint pain

The superior and inferior articular processes of adjacent vertebral laminae form the facet or zygapophyseal joints. They share compressive forces with the intervertebral disk. After trauma or with inflammation they may react with pain signaling, joint stiffness, and degeneration. Interestingly, there is no strong relation between radiographic imaging results and pain; therefore, the diagnosis is strictly clinical (pain radiating to the buttocks and dorsal aspects of the upper limb, provoked by retroflexion of the back and/or rotation). Unfortunately, long-term effects of local steroid injections into the joint or into the vicinity as well as electrical ablation of the nerves innervating the joints ("medium bundle block") have failed to demonstrate long-term effects.

Sacroiliac pain

The sacroiliac joint receives its primary innervation from the dorsal rami of the first four sacral nerves. Arthrography or injection of irritant solutions into the sacroiliac

joint provokes pain with variable local and referred pain patterns into regions of the buttock, lower lumbar area, lower extremity, and groin. Certain maneuvers (e.g., Patrick's test) may provoke typical pain, too. Local blocks sometimes accelerate recovery and facilitate physical therapy. In young male adults in particular, Bechterew disease (ankylosing spondylitis) has to be ruled out.

Muscular pain

Muscular pain is most often the cause of chronic back pain. Pain receptors in the muscles are sensitive to a variety of mechanical stimuli and to biomechanical overload. Anxiety and depressive disorders often play an important role in sustaining muscular pain due to the "arousal reaction," with a continuous increase of muscular tension. Muscular pain may be described as "myofascial pain," if muscles are in a contracted state, with increased tone and stiffness, and contain trigger points (small, tender nodules that are identified on palpation of the muscles, with radiation into localized reference zones). In most patients myofascial pain is the result of a combination of factors: the "arousal reaction," direct or indirect trauma, exposure to cumulative and repetitive strain, postural dysfunction, and physical deconditioning.

On the cellular level, it is presumed that abnormal and persistently increased acetylcholine release at the neuromuscular junction generates sustained muscle contraction and a continuous reverberating cycle. If muscular back pain does not resolve within a few weeks (usually 6 weeks is seen to be crucial), it should be seen as a complex disease with physiological ("biological"), psychological, and psychosocial influences (according to the biopsychosocial model of chronic pain evolution). Therefore, when local therapies alone fail to give long-term pain relief, a major diagnostic and therapeutic workup including physical, psychosocial, and neuropsychological aspects ("multimodal therapy") may be needed.

If adequate therapy is delayed over several months with a trial of unimodal therapies, such as analgesics or injections only, long-term positive effects of multimodal therapeutic approaches become unlikely or very limited.

What are the diagnostic strategies in back pain lasting more than 3 weeks?

Unrelenting pain at rest and the other "specific pain red flags" should generate suspicion for cancer or infection. Appropriate imaging is mandatory in these cases. In cases of progressive neurological deficit, imaging should be done without losing any time, when imaging is available, or the patient can be transferred to a location where imaging is available. Plain anteroposterior and lateral lumbar spine radiographs are indicated first for identifying cancer, fracture, metabolic bone disease, infection, and inflammatory arthropathy. In these diseases, more sophisticated (and expensive and rare) further diagnostic imaging will not add substantial information for most patients. CT scanning is an effective diagnostic instrument when the spinal and neurological levels are well identifiable and bony pathology is suspected. MRI is most useful when the exact spinal and neurological levels are unclear, when a pathological condition of the spinal cord or soft tissues is suspected, when disk herniation is possible, or when an underlying infectious or neoplastic cause is suspected. If interpretation of MRI or CT scans is difficult and nerve root or myelon compression is suspected clinically, myelography may be useful to get a clearer picture, especially in patients with previous lumbar spinal surgery or with a metal fixation device in place. Non-radiographic tests include electromyography (EMG) and somatosensory evoked potential testing (SEP) and help to localize nerve lesions and to differentiate between older and newer lesions.

Therapeutic approaches

Is bed rest an appropriate therapeutic approach in back pain?

Bed rest is only appropriate for acute radiating pain (sciatica), but it should not exceed 1–3 days to avoid progressive inactivity and avoidance, which reinforces abnormal illness behaviors. For all nonspecific myofascial pain, inactivity would have deleterious physiological effects, leading to shortened muscles and other soft tissues, joint hypomobility, reduced muscle strength, and bone demineralization. Therefore, bed rest should not be advised. The patient should be instructed to continue "normal daily activities" as much as possible. Any bed rest recommendations would only reinforce malcognitive and malconditioned behavior ("fear avoidance beliefs"), resulting in a viscous circle of bed rest—increased fear of movement—increased pain on movement because of muscular deconditioning—more bed rest. For these reasons, bed rest is definitely not recommended as a treatment for nonspecific back pain.

What medications are recommended in nonspecific back pain?

Unfortunately, many patients with nonspecific back pain are treated as in acute specific diseases causing pain, with long-term prescriptions of nonsteroidal analgesics, opioids, and centrally acting muscle relaxants, although there is no evidence in the literature for use of these drugs for this indication, and a number of guidelines do not recommend them. Only a few medications are indicated. Tricyclic antidepressants in low to moderate doses are useful to alleviate insomnia, enhance endogenous pain suppression, reduce painful dysesthesia, and help the patient's ability to cope. If a depressive disorder is diagnosed, higher doses would be needed. In some patients, the anxiolytic and sleep-quality-improving calcium channel blockers gabapentin or pregabalin might be helpful. Other coanalgesics and narcotics may only be used if the pain is of malignant, chronic inflammatory, or severe degenerative origin.

Are invasive therapeutic techniques indicated in nonspecific back pain?

In carefully selected patients, such as those with concomitant sacroiliacal or facet joint affection, local injections might facilitate recovery with physical therapy. Local injections into paravertebral soft tissues, specifically into myofascial trigger points, are widely advocated. However, study results are rather disappointing.

If conventional analgesics and invasive techniques are not recommended, what therapy is best for chronic nonspecific back pain?

Behavioral and cognitive behavioral multidisciplinary pain programs have proven effective for many patients, but they need dedicated, well-trained personnel and rather high financial resources to be effective. Therefore, prevention of chronic nonspecific back pain is the key to therapeutic success. Morbid obesity, smoking, general fitness, and job satisfaction should be addressed in all patients to avoid development of chronic nonspecific back pain. Adequate and knowledgeable patient guidance seems to be the most important prophylactic and therapeutic instrument in nonspecific back pain. The goals of chronic pain management are to relieve discomfort (partially) and (more importantly) to improve or restore physical, psychological, and social function. Management involves knowing the cause and course of the pain, educating patients in simple terms, and selecting appropriate "resource-oriented" physical and psychological modalities and techniques. For success, it is vital to achieve a "change motivation" in patients and to educate them on what can be done as self-care.

Pearls of wisdom

- Chronic nonspecific back pain is one of the most frequent patient complaints.
- It is crucial to differentiate nonspecific back pain from specific back pain because the therapeutic techniques differ considerably. This differentiation should be made at the earliest possible moment, because nonspecific back pain tends to take on a life on its own within a couple of weeks or months, resulting in a difficult-to-treat disease.
- "Red flags" help to identify indications for specific and nonspecific pain.
- In general, opioids, NSAIDs, and central muscle relaxants as well as invasive procedures are ineffective in nonspecific back pain and even have the risk to further promote chronic pain development. Instead, intensive counseling, patient education, physical activation, and behavioral interventions have been proven to be effective.
- Psychiatric comorbidity is frequent and should not be overlooked.
- An important goal in advanced chronic back pain patients is concentration of therapeutic efforts on functional improvement rather than pain reduction.

References

[1] Odebiyi DO, Akinpelu AO, Olaogun MOB. S Afr J Physiother 2006;62:17–20.
[2] Olaogun MOB, Adedoyin RA, Ikem IC, Anifaloba OR. Physiother Theory Pract 2004;20:135–42.
[3] Swagerty DL, Hellinger DO. Am Fam Physician 2001;64: 279–86.

Websites

http://www.rcep7.org/projects/handbook/back.pdf