HOW TO APPROACH THE PROBLEM OF LOW BACK PAIN: AN OVERVIEW

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The management of patients with low back pain (LBP) problems by primary care physicians or even spine specialists differ significantly and little is known about treatment strategy. This review is to present the clinical profile and to assess the most common treatment modalities of patients with low-back pain in order to improve the clinical judgment of the treating physician. Data were obtained from a midline literature search of articles in English. A manual revision of original articles was done and demonstrative figures from patients at our institute were added.

LBP is an extremely common problem. It is characterized by attacks, remissions and exacerbations. It is best managed by a multidisciplinary team. Primary coordination of treatment may depend on the patient’s need and the awareness of the treating physician of the importance of history and physical examinations. The following suggested protocol may help to identify red flags that denote more serious conditions.

**Key Words:** Low back pain, red flags, treatment modalities.

**EPIDEMIOLOGY**

Low back pain is a very common condition, about 90% of people suffering from it at some point in their lives.\(^1\) It is a leading cause of lost time at work and disability. For example, in the USA, it is responsible for an annual direct health care expenditure of more than $20 billion.\(^2\)

Backache is usually self-limited, resolving in 4 to 8 weeks in more than 50% of patients, yet the recurrence rate is high, about 85%. Because of the complexity of the bony, muscular ligamentous, and neural elements of the lack of specificity and the high rate of early, spontaneous remission. Exceptions to this include history of recent trauma, presence of red flags or chronic unremitting course. Many treatment modalities, including drug therapy, physical therapy, ultrasound, thermal therapy, local injection and surgeries have been tried, but most studies give variable results.
Back pain is classified into three categories based on the duration of symptoms. Acute back pain is arbitrarily defined as pain that has been present for six weeks or less. Sub-acute back pain has six to 12-week duration and chronic back pain lasts longer than 12 weeks. Using these three categories, we can make predictions about prognosis. At least 60 percent of patients with acute low back pain return to work within one month, and 90 percent return within three months. With minimal intervention, most patients improve in the first few weeks.

Occupations that involve lifting, bending, prolonged sitting, heavy work and bus driving as well as obesity, smoking, all increase the incidence of LBP. Tumors either primary or secondary, infections, fractures either traumatic or spontaneous, elderly on steroid and psychological issues, may all cause LBP.

HISTORY
The goal of diagnosis in LBP is to define the anatomic pain generator(s) as specifically as possible, by focusing on carefully defined clinical subgroups, with the understanding that this is not always possible. The history and physical examination are the first and most important in the evaluation process to help narrow down the diagnosis. The key to that is a careful structure of questions and attentive listening to the answers and mapping out the location of the pain by placing a finger on the single most painful spot. Key areas in the history help to identify the current location of the pain and the changes since its onset. For example, sciatica pain may start with intermittent LBP. Also positions of relief and aggravation of pain are important clues to the diagnosis. For example, a prolapsed lumbar disc will be painful on sitting and better on standing or lying; a patient with lumbar canal stenosis will feel better sitting while he suffers when he walks (neural claudication), or patient with arthritis, sprains, will be relieved when sitting or lying down. Also at this point, it is important for the treating physician to remember the difference between radicular and referred pain. However, if pain does not fit any known diagnostic profile of a syndrome, there may be other factors that interfere with diagnosis and/or recovery that need to be addressed.

PHYSICAL EXAMINATION
This starts when the patient enters the examination room. The patient should be examined in standing, sitting and in lying positions. There are some specific syndromes associated with LBP, most of which can be identified without any expensive or invasive diagnostic procedures.

For instance, (1) Discogenic LBP: the lesion in the disc nucleus or the annulus. The pain increases on sitting, standing or flexing the back. Valsalva maneuvers may increase the pain while lumbar extension may relieve it. (2) Disc herniation with sciatica: the pain radiates down the leg, straight leg raising test is usually positive. Also there is positive radiculopathy based on the nerve root involved. (3) Lumbar canal stenosis: neurogenic claudication is the hallmark. Flexion tends to relieve the radicular symptoms, while extension increases it. (4) Sacroiliac joint dysfunctions: responsible for 30% of patients with non-specific LBP, localized tenderness and intraarticular injection may help in the diagnosis. (5) Facet joint dysfunctions: potential source of LBP, pain increased by extension, localized tenderness, and image-guided facet joint injections can help in the diagnosis. (6) Ligaments and soft tissue: usually musculo-ligamentous pain is a diagnosis of exclusion.

ROLE OF IMAGING AND LABORATORY TEST IN LBP
One goal of evaluation is to minimize unnecessary imaging studies that may generate potentially misleading information. Diagnosis can be confused by the high incidence of radiographic abnormalities in asymptomatic persons. On X-rays, 79% of patients between 50 and 65 years of age have narrowing, sclerosis, or osteophytes, and on magnetic resonance imaging (MRI), 14% of patients aged younger than 40 years and 28% of patients aged older than 40 years have major abnormalities. The majority of asymptomatic abnormalities on MRI are bulges and protrusions but not extrusions. Imaging studies should be ordered in patients with progressive neurologic deficits, failure to improve, history of trauma, and those at elevated risk for malignancy or infection. Several diagnostic tests can help
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Figure 1: Degenerated disc space at L5-S1

Figure 2: CT scan shows prolapsed lumbar disc

Figure 3: CT scan shows degenerative lumbar canal stenosis

Figure 4: Sacrolitis: degenerated and sclerotic CT scan and pelvis plain x-ray

diagnose malignancy or infection in patients with back pain. Serum or urine protein electrophoresis is the best initial diagnostic test for multiple myeloma, given that many patients will have a normal bone scan. A history suspicious for vertebral cancer combined with an elevated erythrocyte sedimentation rate (ESR) has a positive correlation for vertebral cancer. However, the overall prevalence of malignancy in a study of hospitalized patients with an elevated ESR was only slightly higher (25%) than the prevalence in patients with a normal ESR (15%).

Fever, elevated sedimentation rate, leukocytosis, and elevations in C-reactive protein level can all be indicative of infection. Blood cultures demonstrate bacteremia in up to 72% of cases of acute osteomyelitis. MRI is the most sensitive and specific test in identifying spinal infection.

For electromyography and nerve conduction studies usually ordered when neuromuscular disease needs to be confirmed or excluded, as a rule, must be combined with history and physical examination and imaging studies.

DIAGNOSTIC SPINAL INJECTIONS FOR LBP

Spinal injections have become an integral part of LBP management for specific diagnosis. Fluoroscopic needle placement during the injection allows a more accurate diagnosis. Seventy-five percent pain relief obtained after anesthetic injection is adequate to consider the spine structure as significant pain generator. For facet joint block, the response is immediate after injection if the joint is the source of pain 0.5-1.0 ml of 2% xylocaine is injected intra-articularly with fluoroscopic guidance. Placebo response and/or false positive response to a single injection must always be considered up to 30%.
MANAGEMENT OF THE PATIENT WITH LBP
The majority of patients with LBP suffer from pain that is non-specific. However, the high incidence of benign, self-limiting low back pain leads to the risk of overlooking specific causes such as tumor or infection or disc prolapse.

There are a number of guidelines for the evaluation of patients with low back pain, such as those given by the Royal College of General Practitioners, and the institute for clinical system improvement. Improving health care will require more effective guideline implementation and a redesign of delivery processes and systems.

Most guidelines have similar recommendations for the diagnosis of LBP. (1) History and physical exam to identify risk factors, (red flags - Table 1). Further evaluation is usually unnecessary in patients without red flags, because acute low back pain improves in 1 month in > 90% of cases. (2) Reassess if pain persists after 4-6 weeks of conservative treatment. Obtain plain radiographs and basic lab studies (CBC, ESR, chemistry profile, U/A) to screen for systemic illness. (3) MRI to confirm herniated disk or to evaluate for lumbar spinal stenosis, neoplasm infection, other lesions. Sensitivity is high for herniation and spinal stenosis, while there is high false positive specificity rate in asymptomatic patients (bulge in 20%-80%, herniation in 20%, 40%, spinal stenosis in 20% older than 60 yr. (4) Electromyography in selected patients is useful in differentiating lumbar radiculopathy from other causes of radicular leg pain. (5) Myelogram-CT scanning in selected patients to confirm lumbar stenosis. Sensitivity and specificity are similar to MRI.

DRUG THERAPY
Usually, patients start initially with Acetamenophen or the non-steroids anti-inflammatory drugs for mild to moderate pain; the choice of initial anti-inflammatory drugs remains largely empirical. It is recommended that treatment start with a loading dose, followed by the maintenance dose continued at regular intervals. Side effects are common mostly being gastrointestinal irritation and possible development of gastric ulcers and bleeding. Tramadol can be an effective analgesic and has mild selective serotonin reuptake inhibitor properties, but side effects are common.

Opioids: An extensive body of evidence supports the effectiveness of short-acting opioids for moderate to severe pain. Muscle relaxant: frequently prescribed to improve the range of motion to interrupt the pain-spasm-pain cycle, are found very effective when used with NSAIDS.

Tricyclic Antidepressant: Amitriptyline is the most popular antidepressant analgesic used in clinical practice for the treatment of neuropathic pain. Gabapentin: The use of this drug for the treatment of neuropathic pain has recently increased.

THERAPEUTIC INJECTIONS FOR LBP
Rather than deal with the pain in general terms by using medications that go through the whole body and produce side effects, it may be possible to identify the spot causing the patient pain and attack that spot aggressively. This may reverse the process with minimal effect on the body in general. A couple of injection therapies used most commonly in pain management such as trigger-point injections, selective joint injections and epidural injections with steroids have shown to be effective for pain with significant inflammatory component.

PHYSICAL MODALITIES OF LBP
Different physical modalities could be tried in cases where LBP is uncomplicated. Therapeutic heat: Superficial heat (hot packs) for 20-30 minutes, or deep heat (ultrasound for 5-10 minutes
short wave therapy for 10-30 minutes) the therapeutic temperature around 40-45 Degree Celsius. Cryotherapy, like Cold packs 37 cause vasoconstriction is effective in reducing nerve conduction. Electrotherapy like transcutaneous nerve stimulators (TENS) 38 is mainly used for chronic LBP. Traction: Several prospective studies have concluded that they are useless, while acupuncture, though useful perhaps remains elusive.39 Lumbosacral orthosis is of limited use for a majority of LBP.

EXERCISE REHABILITATION FOR LBP
It is clear that active exercise is more effective than rest since it decreases the amount of adhesion and muscle atrophy and increases tissue circulation and oxygenation.40-41 Pain control phase: to teach the patient positions of comfort in rising from bed, and proper exercise to the muscles. Training phase: in strength training, the weaker the patient is to begin with the easier exercise.

OPERATIVE INTERVENTION FOR LBP

Multidisciplinary approach to pain management
LBP pain is a complex phenomenon and is best managed by with a multidisciplinary approach. Primary coordination of treatment may depend on the individual patient's needs and may change over time. For example, at one point, the pain specialist's input may be the most urgent. Later the rehabilitation specialist's efforts may be the most important, while at another point psychological therapy may be what the patient needs most. Pain management challenges these disciplines to work together, often for long periods of time.

The treatment of low back pain and spinal disorders is an important aspect of most neurosurgical practices. The final decision to operate remains the responsibility of the surgeon, but a precise diagnosis is required and poor results mean the decision making process must recommence.42

For example, urgent operations are required in cases like progressive neural deficit, cauda equine syndrome, lumbar trauma with instability, tumors and infections. While the non-urgent operation is for persistent pain that does not respond to proper conservative measures or mechanical LBP with instability.

Microdiscectomy is the standard operation for a prolapsed lumbar disc.33 More extensive operations like laminectomy or an addition of instrumentation or less invasive procedures have to be tailored to specific cases.

Surgical Outcome
The reported surgical outcome in the literature varies and is dependent on multiple factors.44-45 The success rate reaches 90% of the discectomies when there is no compensation is likely to be paid while it falls to 50% in the population of workers where compensation and falls further still to 25% where there is both compensation to be paid and litigation is possible. In spinal canal stenosis, the success rate is about 92%. Factors considered for poor prognosis include, poor patient selection, incorrect diagnosis, improper surgery and with injuries for which compensation should be paid. Proper patient education and better understanding of post rehabilitation would improve the outcome.

CONCLUSIONS
Low back pain is extremely common. The most appropriate diagnostic approach is to look for specific biomechanical causes and identify potential anatomic pain generator(s) when possible. Most symptoms resolve relatively promptly with little intervention, but recurrence is common.

Patient history and physical examination are important in distinguishing potential etiologies and immediately identifying red flags that denote more serious conditions. Findings should be consistent with known pathologic processes. Diagnostic imaging should be ordered only when truly necessary because of the high incidence of radiologic abnormalities in asymptomatic persons.

Once serious illness is ruled unlikely, first-line drug therapy with acetaminophen, a nonsteroidal anti-inflammatory drug, or a cyclooxygenase-2–specific inhibitor is recommended. Short-term use of muscle relaxants may be considered, but their benefits must be balanced with their sedative properties. Patients should be advised to stay as active as possible while continuing usual daily activities. In patients with complicating comorbid conditions,

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such as depression, appropriate therapy should be initiated. Opioids should be prescribed if the effectiveness of other treatments have been insufficient and there is demonstrated evidence of improved function that outweighs any impairment caused by adverse effects. Adjuvant antidepressants and anticonvulsants should be considered, especially in chronic or neuropathic pain and when coincident depression is suspected. If a structural defect is identified and a diagnostic or therapeutic procedure is available, a referral should be considered. If symptoms have not resolved adequately within a 4- to 6-week period, reevaluation and additional diagnostic workup should be considered (Figure 5).

**Figure 5:** Suggested protocol for initial assessment of LBP

![LOW BACK PAIN Diagram](image)

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