

433 Teams

# MEDICINE

## 31 | BACK PAIN



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# Objectives:

1. To recognize the most common causes of low back pain.
2. To identify key features in history and examination which direct to the right diagnosis.
3. To identify red flags.
4. To discuss real cases and there complains.
5. Initial management of back pain.



# Introduction:

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- ✓ Low back pain is one of the most common reasons for visits to physicians in the ambulatory care setting.
- ✓ The total cost related to back pain, both direct and indirect, is estimated to be >\$100 billion per year in the U.S.
- ✓ Acute LBP refers to symptoms present for less than 4 weeks subacute is 4 to 12 weeks, and chronic LBP refers to pain lasting more than 12 weeks. A natural history of acute and subacute LBP is very favorable. Management of chronic back pain is very challenging.
- ✓ Risk factors for chronic low back pain: smoking, obesity, older age, sedentary work, physically strenuous work, psychologically strenuous work, low educational attainment, worker's compensation insurance, job dissatisfaction, psychological factors (depression, anxiety, etc.)
- ✓ If approach is not systematic cost/identification of non-clinically significant lesions/worsening of psychological condition will all be affected.
- ✓ Types of patients with back pain seen in the A&E, primary care, neurology, neurosurgery, orthopedic, rheumatology are different.
- ✓ Guidelines of the American College of Radiology are clear, safe and simple to follow.
- ✓ If patient has significant radicular leg pain, nerve compression is likely. If leg symptoms are severe, or if objective weakness is present, an MRI of lumbar spine is obtained. An MRI is unnecessary in most patients who present with an acute episode of pain.

## A-Non Specific Back Pain:

- Is not associated with significant functional impairment or rapidly progressive neurologic deficits .
- The treatment Paracetamol /Muscle relaxants - NSAID's- rarely use Opioids
- Referrals for physical or occupational therapy may also be considered.
- **Imaging and invasive interventions are not recommended at this stage.**
- After 4 weeks If there is improvement, educational materials are provided, and instructions on self-care are reinforced.
- If **no improvement**, with no red flags or radiculopathy/Spinal stenosis, imaging with **MRI may be recommended**.

### B-Radiculopathy:

- ✓ Radiculopathy is defined as nerve root dysfunction manifesting as **pain, paraesthesia, reduced sensory function, decreased deep tendon reflexes, or weakness.**
- ✓ It is not a cause of back pain; rather, nerve root impingement, disc herniation, facet arthropathy, and other conditions are causes of back pain.
 

- ❖ In a radiculopathy, the problem occurs at or near the root of the nerve, shortly after its exit from the spinal cord. However, the pain or other symptoms often radiate to the part of the body served by that nerve. For example, a nerve root impingement in the neck can produce pain and weakness in the forearm.
  - ❖ They help keep the normal alignment of the spinal vertebrae and limit motion. The pain and discomfort that is caused by degeneration and arthritis of this part of the spine is called facet arthropathy.
- ✓ The onset of symptoms in patients with lumbosacral radiculopathy is often sudden and includes LBP.
- ✓ Preexisting back pain may disappear when the leg pain begins
- ✓ Sitting, coughing, or sneezing may exacerbate the pain, which travels **from the buttock down to the posterior or posterolateral leg to the ankle or foot.**

### C-Spinal Stenosis:

- ✓ Progressive narrowing of the spinal canal may occur alone or in combination with acute disc herniations due to degenerative changes which causes neurogenic claudication. Back pain may coexist, but **predominant finding is neurogenic claudication.**
- ✓ Neurogenic claudication: radicular leg or buttock **Pain, weakness,** and **numbness in the legs while walking.** Onset of symptoms during ambulation is believed to be caused by increased metabolic demands of compressed nerve roots that have become ischemic due to stenosis.
- ✓ Pain is relieved when the patient **flexes the spine.** particularly worse with walking, and relieved with sitting.

- ✓ Flexion increases canal size by stretching the protruding ligamentum flavum, reduction of the overriding laminae and facets, and enlargement of the foramina.
- ✓ Treat with epidural steroid injections if it is affecting patient's quality of life. Surgery is very effective if conservative treatment fails.

### *Radiculopathy and Spinal Stenosis*

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- ✓ Patients in this category can be managed conservatively such as the non specific.
- ✓ Not because it is not serious, but because there is no strong evidence for doing other modalities.
- ✓ Patients should be assessed for: (Follow up)
  - ✓ Depression
  - ✓ Coping
  - ✓ Psychosocial support
  - ✓ If improved, educational materials are provided, and instructions on self-care are reinforced.
  - ✓ If no improvement, Pain service/Psychiatry/Neurology consult
  - ✓ MRI as the imaging modality.

#### **- Degenerative disc disease (osteoarthritis):**

- Many people with severe degenerative disc disease do not have back pain. Surgery is controversial for this indication.

#### **- Spondylolisthesis:**

- Forward slippage of cephalad vertebra on the caudal vertebra. Most common at L4-L5 and L5-S1. Spinal stenosis often coexists, leading to neurogenic claudication.

#### **- Lumbar disc herniation:**

- radicular leg pain (commonly referred to as sciatica) is the predominant finding, although some patients have back pain as well. Back pain without any radicular pain is uncommon but can occur. Most common at L4-L5 and L5-S1. Treatment is anti-inflammatory medication, physical therapy, and epidural steroid injections. Surgery indicated when conservative treatment fails or if patient has progressive neurologic deficit.

## - Musculo-ligamentous strain:

- usually after an episode of bending/twisting, patient feels the back “give way,” often when lifting a heavy object, with immediate onset of back pain. Radiation of pain may occur to buttock/upper posterior thigh to knee level—this is called “referred pain” from muscle spasm. Pain typically does not radiate distal to the knee because no nerve root compression is present.

## - Vertebral compression fracture:

- acute back pain caused by minor stress in **elderly** or in patients on **long-term steroid treatment**. Pain is at the level of the fracture with local radiation across the back and around the trunk (rarely into legs).
- Can occur with minimal or no trauma in patients with osteoporosis.
- Multiple compression fractures can lead to severe kyphosis in the thoracic spine.
- Treatment options include bracing (if patient’s body habitus allows), analgesics, and giving the fracture time to heal. Most fractures heal in 6–8 weeks and symptoms gradually improve. Interventional options include kyphoplasty/vertebroplasty (injection of cement into vertebral body).

### RED FLAGS :

- ❖ *Their presence indicate the possibility of a serious underlying condition , such as malignancy, vertebral infection , vertebral compression fracture , cauda equine syndrome , and ankylosing spondylitis*
- ❖ *Depending on the condition , early referral to the appropriate specialty has a major impact on the out come*
- ❖ *There is a role of lumbosacral x-ray*

## Infection—discitis or osteomyelitis:

- Suspect in patients with history of IV drug use, dialysis, indwelling catheter.
- Laboratory tests to order include CBC with differential, ESR, and CRP.
- If suspicion is high, MRI should be obtained.
- Epidural abscess in the cervical and thoracic spine can lead to rapid neurological deterioration and in most cases requires surgical decompression.

## Paraspinal Abscess:

- **Acute** paraspinal infections are most commonly **bacterial** while subacute could be anything. (staph Aureus, E. Coli, TB, Brucella).
- Localized back pain is the 1<sup>st</sup> symptom.
- Fever, chills, night sweats
- Hematogenous spread with seeding is the suspected source of infection in young.
- Primary source includes bacterial endocarditis, IV drug use, infected catheters, UTI, and others.
- If subacute ask about TB or brucella risk factors.
- There is usually limited motion of the spine that is affected, and movement typically produces severe muscle spasms.

**Compression of the spinal cord** or the **cauda equina** can lead to paralysis or varying degrees of weakness, numbness and bladder dysfunction.

## Neoplasms:

most common spinal tumor by far is metastatic carcinoma— common primary neoplasms that metastasize to spine include breast, lung, prostate, kidney, and thyroid.

## Ankylosing Spondylitis and other spondyloarthritis(SpA):

- Inflammatory back is characterized by:
  - ✓ Young age
  - ✓ Early morning stiffness
  - ✓ Back pain worse in the morning improves with activity.
  - ✓ Nocturnal back pain
  - ✓ Alternating back pain
  - ✓ Dramatic response to NSAID's
  - ✓ Presence of symptoms suggestive of SpA (psoriasis, IBD, and preceding infection)
  - ✓ Examination will reveal restricted movement of the whole spine with a positive schober test (<20cm).



- ✓ Pressure and stretching of the sacroiliac joint will induce significant pain.
- ✓ Presence of peripheral arthritis and/or dactylitis

Schober test <https://www.youtube.com/watch?v=B9RaFB5BwrQ>

### Cauda Equina Syndrome:

- It refers to a characteristic pattern of **neuromuscular** and **urogenital** symptoms resulting from the simultaneous compression of multiple lumbosacral nerve roots below the level of the **conus medullaris**.
- Symptoms include low **back pain**, **sciatica**, **saddle sensory disturbances**, **bladder** and **bowel dysfunction**, and variable **lower extremity motor and sensory loss**. The key findings are bladder dysfunction (retention, incontinence) and saddle anesthesia (numbness in perineal or buttock region)
- This is a surgical **emergency**. An MRI should be obtained immediately.

### Treatment

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- Most patients with acute low back pain have improvement or resolution within 3 to 6 weeks and are managed with NSAIDs, acetaminophen, activity modification, and gradual return to activities. Narcotic analgesics and muscle relaxants should be used judiciously if at all. Patients should be advised to continue ordinary activities within the limits permitted by pain. If symptoms do not improve in 4 to 6 weeks, a course of physical therapy for core-strengthening exercises may be helpful.
- If neurologic deficits present, particularly if these deficits are progressive, a more aggressive approach is indicated. An MRI should be obtained, and if nerve root or spinal cord compression is present, evaluation by a spine specialist is recommended.
- The treatment of chronic nonspecific low back pain is challenging. Most patients with chronic low back pain with or without radiculopathy are treated conservatively (with physical therapy, NSAIDs, injections).
- physical therapy is focused on core strengthening exercises and aerobic conditionings



There is some evidence that massage therapy, chiropractic, and acupuncture may be helpful in the short term, but studies have not been able to show long-lasting benefits.

- If conservative measures fail and symptoms persist for at least 1 year, surgery can be considered, depending on findings on imaging studies and degree of disability. In general, outcomes from surgery are more predictable and successful when surgery is done for radiculopathy (to decompress nerve roots) than for low back pain per se. Surgery (fusion) for degenerative disc disease and chronic low back pain is controversial, and randomized controlled trials have NOT shown significant benefits. A very small percentage of patients may benefit from surgery but careful patient selection is critical and informed consent about expected outcomes is recommended.

### BACK EXAMINATION:

- ❖ The main goal of the history and physical examination is to rule out any structural or systemic conditions that can be the source of back pain. The neurologic examination is very important, and any weakness should be documented.
- ❖ The straight leg raise can suggest nerve root compression. The test is positive if radiculopathy is reproduced when the leg is elevated 30 to 60 degrees with the patient supine. If patient is in severe pain and cannot tolerate even a slight elevation of the leg during this test, it is highly suggestive of nerve root compression.

### HISTORY AND EXAMINATION:

Remember Same complain/Different Etiologies:

- ❖ Site
- ❖ Duration
- ❖ Pattern
- ❖ Severity
- ❖ Relieving/aggravating factors
- ❖ Associated symptoms
- ❖ Neurological deficit
- ❖ Affection on activity and quality of life
- ❖ Occupation
- ❖ Past medical/surgical history

**Table 1. Adult with low back pain (acute)**

- History and physical key points
  - Duration and nature of symptoms
  - Presence of red flags (trauma history, unintentional weight loss, immunosuppression, history of cancer, intravenous drug use, steroid use, osteoporosis, age > 50 y, focal neurologic deficit, progression of symptoms)
  - Symptoms of spinal stenosis, radiculopathy
- Decision point (<4 weeks of symptoms)
  - No red flags, signs, or symptoms of spinal stenosis or radiculopathy
    - Go to order set for nonspecific acute low back pain
  - Signs or symptoms of spinal stenosis or radiculopathy
    - Go to order set for acute low back pain with radiculopathy or spinal stenosis
  - Red flags present
    - Go to order set for acute low back pain with red flags

## MCQS

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1. A 66-year-old man complains of a 1-year history of low back and buttock pain that worsens with walking and is relieved by sitting or bending forward. He has hypertension and takes hydrochlorothiazide but has otherwise been healthy. There is no history of back trauma, fever, or weight loss. On examination, the patient has a slightly stooped posture, pain on lumbar extension, and has a slightly wide based gait. Pedal pulses are normal and there are no femoral bruits. Examination of peripheral joints and skin is normal. What is the most likely cause for this patient's back and buttock pain?

- a. Lumbar spinal stenosis
- b. Herniated nucleus pulposus
- c. Atherosclerotic peripheral vascular disease
- d. Facet joint arthritis
- e. Prostate cancer

2. A 22-year-old man develops the insidious onset of low back pain improved with exercise and worsened by rest. There is no history of diarrhea, conjunctivitis, urethritis, rash, or nail changes. On examination, the patient has loss of mobility with respect to lumbar flexion and extension. He has a kyphotic posture. A plain film of the spine shows sclerosis of the sacroiliac joints. Calcification is noted in the anterior spinal ligament. Which of the following best characterizes this patient's disease process?

- a. He is most likely to have acute lumbosacral back strain and requires bed rest.
- b. The patient has a spondyloarthropathy, most likely ankylosing spondylitis.
- c. The patient is likely to die from pulmonary fibrosis and extrathoracic restrictive lung disease.
- d. Rheumatoid factor is likely to be positive.
- e. A colonoscopy is likely to show Crohn disease.

3. A 50-year-old male complains of low back pain and stiffness, which becomes worse on bending and is relieved by lying down. There are no symptoms of fever, chills, weight loss, or urinary problems. He has had similar pain several years ago. On exam there is paraspinal tenderness and spasm of the lower lumbar back. There are no sensory deficits, and reflexes are normal. The next step in management would be:

- a. Lumbosacral spine films
- b. Stretching exercises
- c. Weight training
- d. Bed rest with pain control

e. MRI

## ANSWER

1. The answer is A. Lumbar spinal stenosis is a frequent cause of back pain in the elderly. Patients typically have pain that radiates into the buttocks (and sometimes thighs) and is aggravated by walking and by lumbar extension. Decreased vibratory sensation and a wide based gait may also be seen. Narrowing of the spinal canal is usually caused by age-related degenerative changes. A recent randomized controlled trial demonstrated that surgery was more effective than medical therapy in the relief of symptoms for patients with lumbar spinal stenosis. Symptoms often recur several years after surgery.

Disc herniation and facet joint arthropathy usually cause unilateral radicular symptoms. Leg pain associated with walking can also be caused by vascular disease, but the symptoms often are unilateral and usually occur in the distal leg. Normal pedal pulses and the classic history make vascular claudication an unlikely diagnosis in this patient. The bone pain of metastatic cancer is rarely positional and is usually unremitting, causing pain both day and night.

2. The answer is B. Insidious back pain occurring in a young male and improving with exercise suggests one of the spondyloarthropathies—ankylosing spondylitis, reactive arthritis (including Reiter syndrome), psoriatic arthritis, or enteropathic arthritis. In the absence of symptoms or findings to suggest one of the other conditions and in the presence of symmetrical sacroiliitis on x-ray, ankylosing spondylitis is the most likely diagnosis. Acute lumbosacral strain would not be relieved by exercise or worsened by rest. The prognosis in ankylosing spondylitis is generally good, with only 6% dying of the disease itself. While pulmonary fibrosis and restrictive lung disease can occur, they are rarely a cause of death (cervical fracture, heart block, and amyloidosis are leading causes of death as a result of ankylosing spondylitis). Rheumatoid factor is negative in all the spondyloarthropathies. Crohn disease can cause an enteropathic arthritis, which may precede the gastrointestinal manifestations, but this diagnosis is far less likely in this case than ankylosing spondylitis.

3. **The answers is D.** The patient presents with symptoms consistent with acute mechanical low back pain. Even patients with lumbar disc herniation and sciatica improve with nonoperative care, and imaging studies do not affect initial management. Bed rest, three to seven days, is recommended, with adequate pain control and reassurance. Active therapy to restore range of motion and function is appropriate after pain and spasm are relieved.

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