

An Approach to a Patient with Low Back Pain

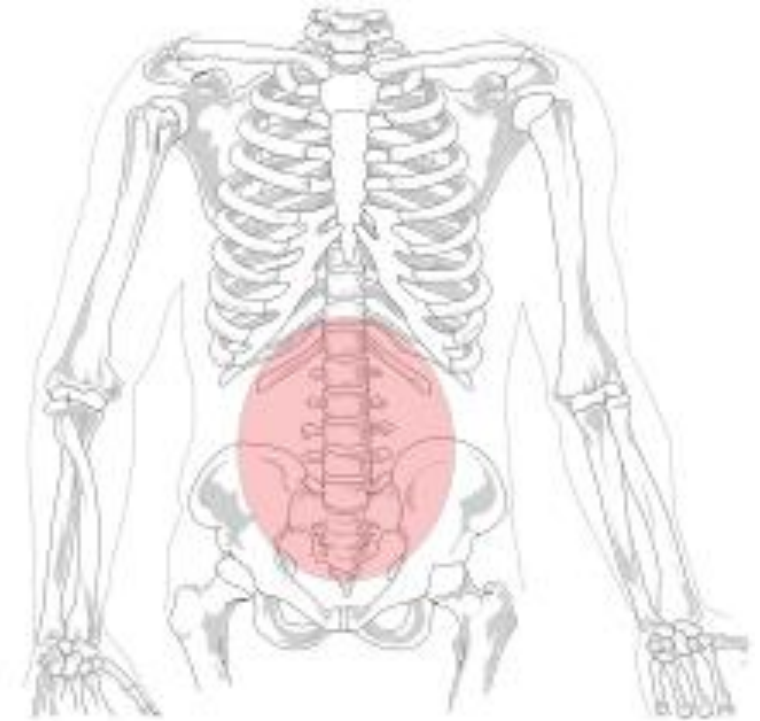
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Low Back Pain

Low back pain may be defined as pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica.



Prevalence

- Low back pain (LBP) is a common clinical problem in the daily practice and up to 84 percent of adults have low back pain at some time in their lives
- Back pain is the second most common symptom-related reason for clinician visits in the United States

In Bangladesh COPORD Study

Prevalence (%) of MSK Pain

Pain Location	Rural, n = 2601	Urban Slum, n = 1307	Urban Affluent, n = 1252
Low back	20.1 (18.6–21.7)	18.1 (16.1–20.3)	18.4 (16.3–20.7)
Knee	14.0 (12.7–15.4)	14.2 (12.4–16.2)	15.8 (13.9–18.0)
Hip	13.0 (11.7–14.4)	5.9 (4.7–7.4)	7.0 (5.7–8.6)
Shoulder	11.5 (10.3–12.8)	7.3 (6.0–8.9)	9.3 (7.8–11.10)
Neck	10.8 (9.7–12.1)	8.3 (6.9–10.0)	10.2 (8.6–12.0)
Heel	7.7 (6.7–8.8)	5.9 (4.7–7.4)	6.6 (5.3–8.2)
Elbow	6.7 (5.8–7.8)	6.9 (5.6–8.5)	6.2 (5.0–7.7)
Wrist	6.0 (5.1–7.0)	6.8 (5.5–8.3)	6.9 (5.6–8.5)
Hand	5.8 (5.0–6.8)	5.7 (4.5–7.1)	6.4 (5.1–7.9)
Foot	5.1 (4.3–6.0)	3.9 (3.0–5.1)	3.3 (2.4–4.5)
Other	2.6 (2.0–3.3)	7.6 (6.3–9.2)	7.2 (5.9–8.8)

Figures in parentheses are 95% CI.

Prevalence

The prevalence of back pain has been estimated in multiple surveys, representing different populations and different definitions

14% of survey respondents in the US had back pain, and 2% had back pain with sciatica, lasting at least two weeks

The long-term outcome of low back pain is generally favorable

90 percent of patients seen for low back pain in primary care did not seek care after three months

Deyo RA et al. What can the history and physical examination tell us about low back pain? JAMA 1992; 268:760

Types of back pain

Acute if it is persisting for 4 weeks

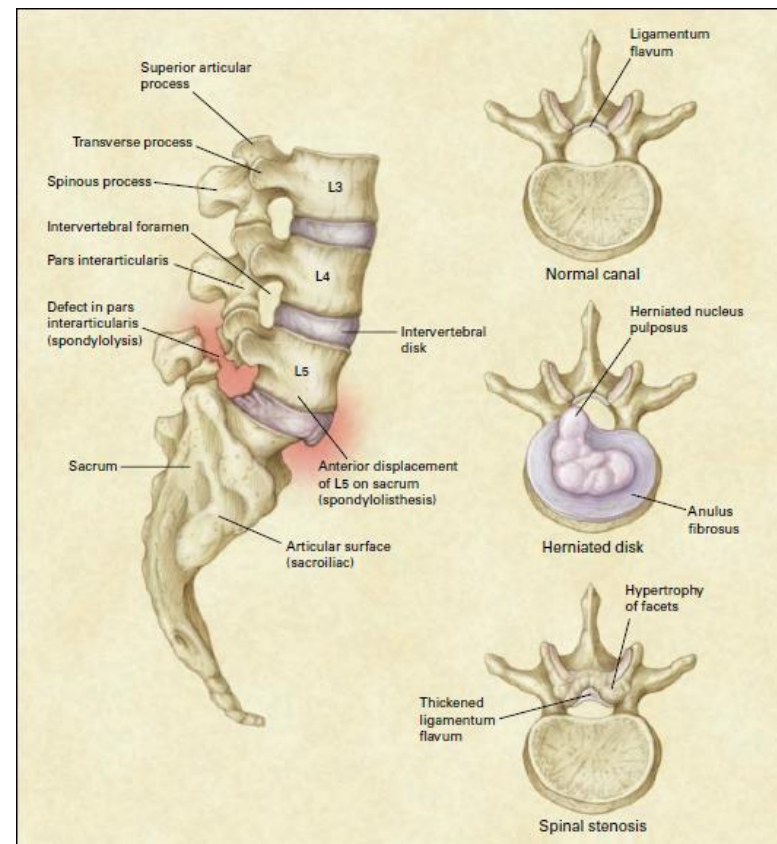
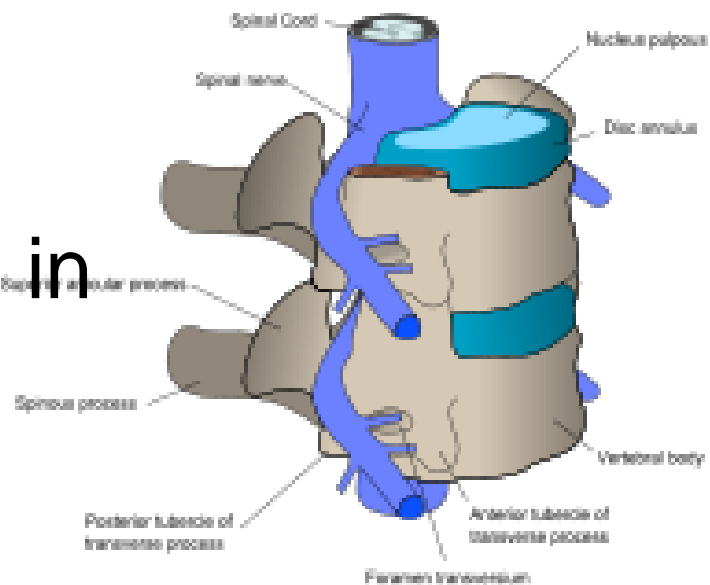
Subacute if persisting for 4-12 weeks or

Chronic if the pain is persisting for more than 12 weeks

Chou R et al. Diagnosis and Treatment of Low Back Pain.
Ann Intern Med. 2007;147:478-491

Origin of Low Back Pain

The cause of pain cannot be established in up to 85% of patients.



Differential Diagnosis

The differential diagnosis of LBP can be classified broadly as

- Mechanical or nonspecific
- Non-mechanical or due to underlying diseases and
- Referred pain from viscera

Differential Diagnosis

Mechanical LBP (97%)	Non-Mechanical LBP (1%)	Visceral Referred Pain (2%)
<i>Lumbar strain, sprain (70%)</i>	<i>Neoplasia (0.7%)</i> <i>Metastatic carcinoma</i> <i>Lymphoma and leukemia</i> <i>Spinal cord tumors</i> <i>Retroperitoneal tumors</i> <i>Primary vertebral tumors</i>	<i>Disease of pelvic organs</i> <i>Prostatitis</i> <i>Endometriosis</i> <i>Chronic pelvic inflam. Disease</i>
<i>Degenerative discs and facets (10%)</i>	<i>Infection (0.01%)</i>	<i>Renal disease</i>
<i>Herniated disc (4%)</i>	<i>Inflammatory arthritis (0.3%)</i>	<i>Aortic aneurysm</i>
<i>Spinal stenosis (3%)</i>		<i>Gastrointestinal disease</i>
<i>Osteoporotic fracture (4%)</i>		
<i>Spondylolisthesis (2%)</i>		
<i>Traumatic fracture (<1%)</i>		
<i>Congenital disease (<1%)</i>		

Approach Consideration

History

Physical Exam

Lab Investigations and Imaging

History

Is there evidence of systemic disease?

Is there evidence of neurologic compromise?

Is there social or psychological distress contributing to chronic, disabling pain?

Clues to underlying medical causes

A number of clues should be looked for

- history of cancer
- age over 50 years
- duration of pain greater than one month
- fever
- night sweats
- unexplained weight loss
- nocturnal pain
- unresponsiveness to previous therapies

Clues to underlying medical causes

Neoplasia: previous
 current history of malignancy

Infection: history of tuberculosis
 AIDS
 intravenous drug abuse
 recent genitourinary procedures

Clues to underlying medical causes

Metabolic bone diseases:

previous fractures

menopause

corticosteroid intake

Gastrointestinal:

diarrhoea

haematochezia, abdominal pain

Genitourinary:

urethritis, menstrual disturbances

Physical Examination

Key signs in the physical examination

Inspection of back:

Scoliosis, kyphosis or gibbus

Range of motion:

Ankylosing spondylitis

Palpation of the back:

tenderness in spinal infection

Straight leg raising test:

Radiculopathy

Neurologic assessment should focus on L5 and S1 roots

Key signs in the physical examination

Ocular - conjunctivitis, iritis

Cutaneous - psoriasis, mouth ulcers, balanitis, keratoderma blennorrhagica

Musculoskeletal - peripheral arthritis, dactylitis, enthesitis, heel pain

Key signs in the physical examination

Sciatica can be defined as pain radiating below the knee.

It is a rare symptom, being reported by only 1 per cent of patients with back pain, but its presence is usually associated with an identifiable etiology

Straight leg raising sign

Investigations

Imaging and other laboratory studies in the first 4 - 6 weeks are not necessary, unless there are neurologic findings or a high suspicion of a systemic etiology

The American College of Physicians and the American College of Radiology have identified potential “red flags” for a dangerous cause of back pain and represent an indication for earlier imaging studies.

Red flags

Previous history of cancer

Unexplained weight loss

Loss of bladder or bowel control

Significant motor weakness or sensory deficit

Loss of sensation in the buttocks

Significant trauma related to age

Chronic corticosteroid use

Severe pain after lumbar surgery in past year

Fever

Intravenous drug use

Validity of the history with underlying cause

Disease	History	sensitivity	Specificity	+ Ve LHR	- Ve LHR
	<i>Age >50 y</i>	<i>0.77</i>	<i>0.71</i>	<i>2.7</i>	<i>0.32</i>
	<i>Previous history of cancer</i>	<i>0.31</i>	<i>0.98</i>	<i>14.7</i>	<i>0.70</i>
<i>Cancer</i>	<i>Unexplained weight loss</i>	<i>0.15</i>	<i>0.94</i>	<i>2.7</i>	<i>0.90</i>
	<i>No relief with bed rest</i>	<i>0.90</i>	<i>0.46</i>	<i>1.7</i>	<i>0.21</i>
	<i>Duration of pain >1 month</i>	<i>0.50</i>	<i>0.81</i>	<i>2.6</i>	<i>0.62</i>
	<i>All the features</i>	<i>1.00</i>	<i>0.60</i>	<i>2.5</i>	<i>0.0</i>

Deyo RA, Diehl AK. Cancer as a cause of back pain: frequency, clinical presentation, and diagnostic strategies. J Gen Intern Med. 1988;3:230-8.

Validity

Diseases	History	Sensitivity	Specificity	+ Ve LHR	- Ve LHR
Spinal osteomyelitis	Spinal tenderness to percussion	0.86	0.60	2.1	0.23
Compression fracture	Age 50 y	0.84	0.61	2.2	0.26
	Trauma	0.30	0.85	2.0	0.82
	Corticosteroid use	0.06	0.995	12.0	0.94
Herniated disc	Sciatica	0.95	0.88	7.9	0.06
	Ipsilateral straight-leg raising	0.80	0.40	1.3	0.50
	Ankle dorsiflexion weakness	0.35	0.70	1.2	0.93
	Great toe extensor weakness	0.50	0.70	1.7	0.71
	Impaired ankle reflex	0.50	0.60	1.3	0.83

Validity

Diseases	History	Sensitivity	Specificity	+ Ve LHR	- Ve LHR
Spinal stenosis	Age >65	0.77	0.69	2.5	0.33
	Severe lower-extremity pain	0.65	0.67	2.0	0.52
	No pain when seated	0.46	0.93	6.6	0.58
	Wide-based gait	0.43	0.97	14.3	0.59
Ankylosing Spondylitis	Positive responses to 4 of 5 screening questions	0.23	0.82	1.3	0.94
	Age at onset >40 y	1.00	0.07	1.1	0.0
	Morning back stiffness	0.64 0.59	0.59	1.6	0.61
	Chest expansion ≥ 2.5 cm	0.09	0.99	9.0	0.92

Katz JN, Dalgas M, Stucki G, Katz NP, Bayley J, Fossel AH, et al. Degenerative lumbar spinal stenosis. Diagnostic value of the history and physical examination. *Arthritis Rheum.* 1995;38:1236-41.

Gran JY. An epidemiological survey of the signs and symptoms of ankylosing spondylitis. *Clin Rheumatol.* 1985;4:161-9.

Investigations

If no improvement after 4-6 weeks plain anteroposterior and lateral radiographs of the lumbosacral spine may be useful

The aim of imaging is to rule out tumor, infection, instability, spondyloarthropathy, and spondylolisthesis.

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Imaging

CT or MRI is indicated:

Progressive neurologic deficits,

High suspicion of cancer or infection,

Those with >12 weeks of persistent low back pain

Treatment

- The treatment of acute nonspecific low back pain is typically with conservative measures such as reassurance and the use of simple pain medications and the continuation of as much normal activity as the pain allows.
- Ultrasound and shock wave therapies do not appear effective and therefore are not recommended.
- Exercise therapy is effective in decreasing pain and improving function for those with chronic low back pain.

Surgery

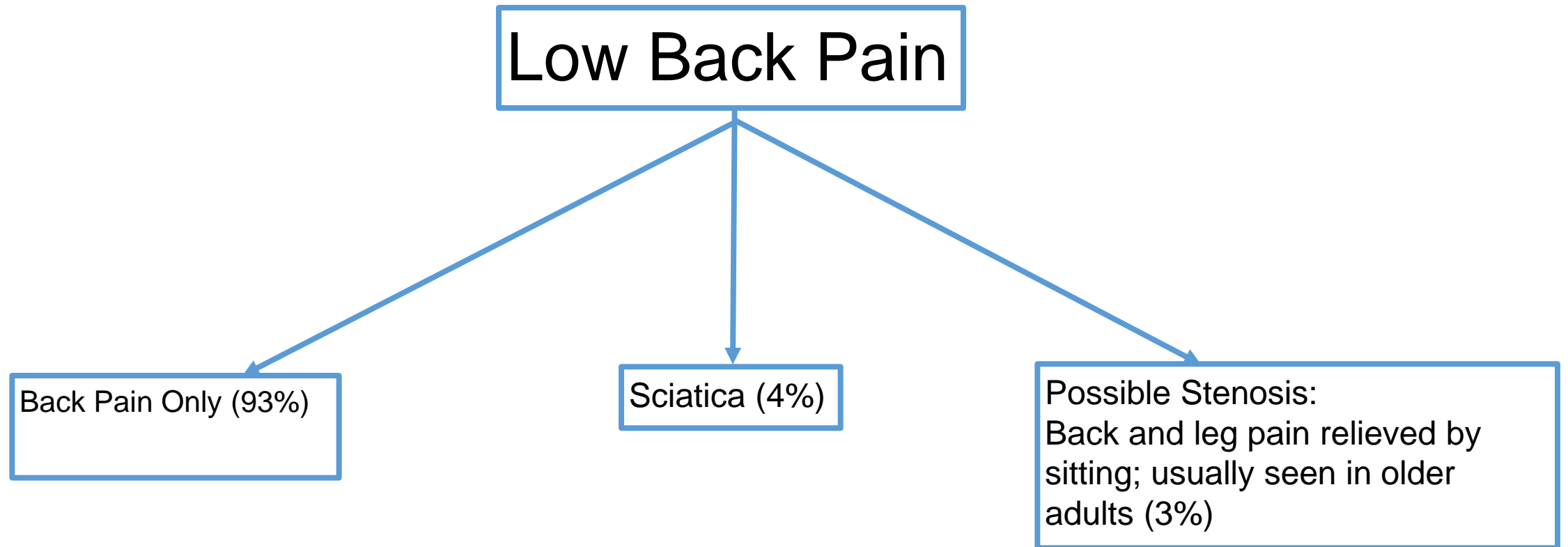
- Urgent referral to neurosurgeons or to orthopedic surgeons specialized in spine surgery is indicated for patients with suspected cauda equina syndrome or spinal cord compression.
- Surgical referral is also indicated for patients with progressive or severe neurologic deficits.
- Patients with persistent sciatica, sensory deficits, or reflex loss after four to six weeks, and who have consistent clinical findings, may also benefit from a surgical referral.

A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society

Ann Intern Med. 2007;147:478-491

Summary

Algorithm



Back Pain Only (93%)

Simple Back Pain:
Age < 50,
no systemic feature
No h/o cancer
No neurologic deficit
> 0.99 LHR MSK cause

Complicated back pain:
Age ≥ 50
Systemic signs
Fever
Weight loss
h/o cancer
Hematuria
Adenopathy
i/v drug use
1-10% probability of systemic disease

No test.
Conservative for 6 wks

Improved

Not improved

ESR

If ≥ 2 risk factors or ESR > 20, Obtain radiographs

If radiographs or ESR abnormal, consider further imaging, usually MRI

Sciatica (4%)

Radiculopathy:
S/S of radiculopathy without bladder involvement or bilateral findings (99%)

Urgent situations:
Acute radiculopathy with urinary retention, saddle anaesthesia, or bilateral neurologic findings (1%)

Conservative care for 6 wks unless neurologic deficit progresses

Urgent consultation and CT/MRI to evaluate for cord or cauda equina compression

Improved

Not Improved

CT/MRI

Consider discectomy

Possible stenosis:
Back and leg pain relieved by sitting; usually
seen in older adults (3%)

Tolerable symptoms without
neurologic deficit

Intolerable symptoms or
neurologic deficits

Treatment of
symptoms

Improved

Not improved

MRI, CT, or
electrodiagnosis

Consider laminectomy

Thank You

Recommendation 1

Clinicians should conduct a focused history and physical examination to help place patients with low back pain into 1 of 3 broad categories:

- nonspecific low back pain,
- back pain potentially associated with radiculopathy or spinal stenosis, or
- Back pain potentially associated with another specific spinal cause.

The history should include assessment of psychosocial risk factors, which predict risk for chronic disabling back pain

Recommendation 2

Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain

Recommendation 3

Clinicians should perform diagnostic imaging and testing for patients with low back pain when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination

Recommendation 4

Clinicians should evaluate patients with persistent low back pain and signs or symptoms of radiculopathy or spinal stenosis with magnetic resonance imaging (preferred) or computed tomography only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy)

Recommendation 5

Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options

Recommendation 6

For patients with low back pain, clinicians should consider the use of medications with proven benefits in conjunction with back care information and self-care.

Clinicians should assess severity of baseline pain and functional deficits, potential benefits, risks, and relative lack of long-term efficacy and safety data before initiating therapy

For most patients, first-line medication options are acetaminophen or nonsteroidal anti-inflammatory drugs.

Recommendation 7

For patients who do not improve with self-care options, clinicians should consider the addition of nonpharmacologic therapy with proven benefits—

Acute low back pain, spinal manipulation

Chronic or subacute low back pain, intensive interdisciplinary rehabilitation, exercise therapy, acupuncture, massage therapy, spinal manipulation, yoga, cognitive-behavioral therapy, or progressive relaxation

Is this a surgical emergency?

- An aortic aneurysm can be responsible for a dull, gnawing back pain due to direct compression of the aneurysm on the lumbar vertebrae.
- They are typically seen in elderly patients, especially white men, and physical examination may reveal a pulsating abdominal mass and decreased pulses in the lower extremities.

Is this a surgical emergency?

- Diagnosis is most important because rupture or dissection of the aneurysm can be fatal in 15 to 70 per cent of cases in various series.
- In this instance, the patient presents with a sudden, excruciating tearing abdominal or back pain radiating to the groin, buttocks, or thighs with haemodynamic compromise (hypotension, tachycardia, and shock).
- Up to 30 per cent of ruptured aneurysms are initially misdiagnosed. Preventive surgery (before rupture or dissection) is the optimal treatment.

- The term mechanical is usually used to designate an anatomical or functional abnormality without underlying neoplastic or inflammatory disease. In clinical practice around 97% of all LBP are within this category.
- The LBP which are associated with either neoplastic or inflammatory diseases are called nonmechanical and around 1% of all clinical cases are in this group.
- The visceral LBP are a group of disorder in which the visceral pathology is responsible for referred pain in the low back region.

- The pain in a patient with a herniated disc tends to be aggravated by prolonged sitting as well as any manoeuvre that increases intrathecal pressure such as sneezing, coughing, or defaecation.
- It is often associated with paraesthesiae and weakness in the distribution of the involved nerve.

Does the patient have sciatica and/or neurological signs?

- Patients with spinal stenosis are usually older and typically complain of pain and/or paraesthesiae in one or both buttocks, thighs, and/or legs that develop on standing or walking and are relieved by 15 to 20 min rest ('neurological claudication').
- These patients often walk with the trunk flexed since extension aggravates their symptoms by worsening nerve impingement.

Does the patient have sciatica and/or neurological signs?

- The neurological examination is most often normal or shows non-specific abnormalities, such as reduced or absent ankle reflexes.
- Differentiating neurological from vascular claudication can be difficult since both problems occur in the same age category. Typically, pain from vascular claudication is relieved faster with rest than that of neurological claudication.

Is this a surgical emergency?

- Cauda equina syndrome
- Expanding vascular aneurysm

In the first instance, the patient will usually present with low back and/or buttock pain, associated with bilateral sciatica, neurological symptoms in the lower extremities, and urinary and/or bowel incontinence.

Central disc herniation is the most common cause of the syndrome, followed by tumours and epidural abscesses.

Is this a surgical emergency?

- Physical examination may show bilateral weakness, sensory losses, saddle anaesthesia, decreased reflexes in the legs, and decreased rectal tone.

Imaging

- Diagnostic procedures (magnetic resonance imaging (MRI), computed tomography (CT) scan, or myelogram) should be performed on an emergency basis if bowel and bladder control are to be preserved.

Clinical approach to the diagnosis of low back pain

Underlying medical cause of back pain
(infectious, inflammatory, metabolic,
tumoural, or visceral)

Signs of nerve root compression

Whether the patient needs emergency
surgery