

LOW BACK PAIN

The cost of upright posture for over 70 % of human population comes in the form of back pain and among these almost 60-70% recovers spontaneously within few days to few weeks but with the possibility of recurrence in most of the cases.

Beside this there are other factors also which affects the spine and causes pain. Below is the list of the causes of pain in back which may be associated with radicular pain which may travel to the toes from back. The extent of radiation may vary e.g. to buttocks, thigh, back of knee, calf, (front back or sides) foot, sole, dorsum of the foot, outer aspect, sometimes numbness in toes (one or more). The pain radiation may occur in one or both the lower limbs.

In very rare group of patients, the symptoms mentioned below are present:-

1. Weakness of muscles around pelvis or thigh.
2. Difficulty in controlling bladder or bowel movements (control over urine /defecation).
3. Severe pain not relieving with strong medicines.

Patients with these symptoms may require immediate surgical intervention.

Causes of Back Pain

1. [Functional back pain/ Postural back pain/ Protuberant abdomen \(Pregnancy, obesity\)/ Occupational bad posture](#)
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1. Functional back pain/ Postural back pain/ Protuberant abdomen (Pregnancy, obesity)/ Occupational bad posture

Back pain or discomfort arising out of prolonged poor posture is postural lower back pain.

The poor posture of sitting and standing for long duration can put overload or extra strain on muscles, ligaments, and tendons, causing them to overstretch, leading to microtrauma and pain. If the same persists for long, the involved structures may become tight, restricting the normal movement.

Symptoms:

1. Pain and stiffness over lower back
2. Decreased range of motion in the affected area.
3. Numbness and tingling (pins and needles)
4. Difficulty in walking and balancing.
5. Other symptoms: Numbness, tingling/ pins and needles, gait problems, balance problems.

Treatment: seek professional help as soon as you notice the above symptoms of postural back pain. Physiotherapy helps in reducing the pain and other symptoms. Also, the postural abnormality can be corrected after detailed examination and exercise plan. Your GP will be able to provide you anti-inflammatory drugs to help you remain active.

Physiotherapy includes

- Electrotherapy
- Manipulations
- Mobilization
- Soft tissue treatment

Avoid activities involving sitting or driving for long periods at a time. Take regular breaks and postural exercise to be carried out.

Ignorance of the symptoms may cause worsening of symptoms, the joints may get damaged leading to more painful condition and arthritis.

2. Osteoarthritis/ Spondylosis

Age related wear and tear osteoarthritis or degeneration of vertebral column is referred to "spondylosis" or O.A. spine. It commonly precipitates as cervical spondylosis and lumbar spondylosis. The commonly affected sites are vertebral bodies, neural foramina and facet joints. In severe cases the spinal cord and/ or nerve roots are compromised causing sensory or motor disturbance producing symptoms in lower limb like

1. Low back Pain which may radiate down to buttocks, thigh, calf and foot (sciatica).
2. Paresthesia (abnormal sensation of the skin).
3. Muscle weakness.
4. Imbalance.

In **CERVICAL SPONDYLOSIS** the compression of a nerve root emerging from the spinal cord may cause radiculopathy i.e. sensory and motor disturbance, severe pain in neck, shoulder, arm back which may be accompanied by muscle weakness.

Direct pressure due to degenerated vertebral bones over spinal cord may result in myelopathy characterized by

1. Generalized global weakness in the limbs below the site of compression
2. Loss of co-ordination.
3. Vertigo and gait dysfunction.
4. Loss of balance.
5. Loss of bladder or bowel control.
6. Paresthesia in limbs.

Causes

1. Ageing.
2. Vertebral joint subluxation.

3. Stress induced by sports.
4. Acute or repetitive trauma.
5. Poor posture.

Spondylosis can affect person of any age, however older people are more susceptible.

Diagnosis:

The diagnosis can be established clinically.

X-ray, CT, MRI may be helpful in diagnosis together with physical examination and history.

Treatment: Physiotherapy with analgesics in case of severe pain and physiotherapy and posture training in chronic condition can help elevate the pain.

3. Intervertebral disc prolapse

(Terminologies: Slipped disc herniated disc, prolapsed disc, ruptured disc are the common names used for it. Disc protrusion, sciatica, degenerative disc disease, disc degeneration are closely related disc conditions.)

It is a condition where the outer rim (annulus fibrosus) of the vertebral disc tears to let the nucleus (gelatinous portion) to herniate or escape through the torn fibers to enter the spinal canal.

Signs and symptoms:

- Pain ranges from mild to severe neck pain or low back pain, which radiates to the area supplied by the nerve root associated with the herniated disc which may be present in thigh back of knee, leg or feet.
- Numbness
- Paresthesia
- Tingling sensation
- Muscle weakness

- Paralysis may be present

The sciatic nerve irritation in case of lumbar disc prolapse may cause sciatica.

The pain is combination in nature.

This may be associated with bladder or bowel incontinence.

If the herniation is very large it can cause cauda equina syndrome i.e. paralysis, loss of bowel & bladder control and sexual dysfunction.

Diagnosis:

CT Scan, MRI, Electromyography, NCV

Treatment:

Most of the prolapsed intervertebral disc cases can be treated successfully conservatively by physiotherapy, rest, NSAIDS, bracing and weight control.

Epidural corticosteroids injections provide a slight and questionable. Short term improvement for those with sciatica, but are of no long term benefit. Safety of epidural administration of corticosteroids has not been established, and FDA has to approve corticosteroids for this case.

Surgery: Surgery may be useful when a herniated disc is causing significant pain radiating into the leg, significant leg weakness bladder problems or loss of bowel control.

4. Sprain/strain pain due to soft tissue injury

Back strain

Back strain occurs when muscles supporting the spine are pulled or twisted.

Types of back strain:

Acute back strain

This may result from a single instance of over stressing back muscles.

E.g. lifting heavy weight, road traffic accident.

Chronic Back Strain

When there is a constant trauma for longer duration that leads to wearing out of back muscles.

Signs and symptoms

1. Localized pain which may or may not radiate down to leg.
2. Pain improves with rest and worsens with activities.
3. Movement restricted due to muscle spasm.

Diagnosis : Mostly it is clinical in extremely painful cases, x-ray, MRI to be taken to rule out fractures and disc herniation.

Treatment: Physiotherapy, rest, NSAIDS (Non Steroidal Anti Inflammatory Drugs), Posture correction.

Prolonged rest is not recommended.

Proper technique to lift weight is to be followed.

5. Osteoporosis

Weak and fragile bones. The formation of new bones tissue is not equal to the removal of old bone tissue. The bone becomes porous which is visible on x-ray, it's weakness sometimes lead to sudden and unexpected fractures. The bone mass is reduced. It is common in old age women but also found in men of 50 years and above.

Symptoms

1. Loss of height (approx 1 inch or more)

2. Forward bending posture
3. Short breath
4. Bone fractures
5. Low back pain

Diagnosis

Early diagnosis can be established by BMD also known as DEXA or DXA (Dual Energy x-ray absorptiometry) scan regular X-ray shows osteoporosis only when it is very advanced.

Treatment :

Exercise, vitamins and mineral supplements and medications.

Exercise and supplements are suggested to pregnant osteoporosis often.

6. Back pain due to Gyenological causes / Pregnancy / Post Pregnancy

Causes :-

Pre Menstrual Syndrome (PMS)- the common symptoms include low back pain, headache, fatigue, bloating. Some emotional symptoms may also be present like mood swings, food cravings, anxiety, trouble in concentration.

Pre Menstrual Dysmorphic Disorder – It is a more severe form of PMS. The symptoms are similar to those of PMS, however they may be worse. It occurs in fewer women as compared to PMS.

Endometriosis – The tissue lining of the uterus, known as endometrial tissue, grow outside the uterus. It may grow on the ovaries, fallopian tubes and other tissue linings. It may affect urinary tract and bowel.

The symptoms include:-

- Very painful menstrual cramps
- Low back pain
- Pain while urination or bowel movement during periods
- Pain during and after sex
- Bleeding or spotting between periods

Dysmenorrhea – The menstruation is very painful, though manageable. Pain in the lower abdomen, lower back, hips and legs. The pain usually lasts for 1 to 3 days with dull and achy, or shooting.

Pregnancy – Low back pain occurs commonly during 7th month onwards of pregnancy. The common place of pain is below the waist and tail bone. Center of back and waistline may also be painful. It is because of the protuberant abdomen and weight over the lower abdominal area.

Post Pregnancy Back Pain/ Post-Partum Back pain - Back pain during pregnancy is quite common – approximately half of all pregnancies are complicated by back pain. In about ten percent of the time, the pain can become so severe that it interferes with the ability to work or carry out normal, everyday activities.

The vast majority of women who experience postpartum back pain develop the symptoms due to pregnancy-related changes in the musculoskeletal system that persists after delivery. In some cases, women may undergo bodily trauma during childbirth that directly involves the lower back and pelvic bones, joints, and/or soft tissues, causing additional pain and discomfort. The type of delivery— vaginal, instrumental or cesarean section (C-section) may also have a role to play in postpartum back pain.⁴ Postpartum back pain mostly occurs while performing activities that involve body movements,³ such as walking, lifting, bending, and/or carrying the new baby, and may be relieved with rest, exercise, and home treatments. The type and severity of pain depend on the underlying cause. The sudden decrease in hormone levels may cause localized and/or overall effects, such as⁴:

- A general feeling of tiredness
- Activity intolerance
- Pain in the lower back and hip
- Back pain while walking or performing an exercise

If unsupported posture and body mechanics are used at this time, the risk of further trauma to the lower back and hip are higher.

Causes of back pain after Pregnancy

Diastasis recti

The uterus enlarges during pregnancy to accommodate the growing fetus. This change causes the muscles of the abdominal wall to stretch substantially. The stretching results in loss of muscle tone in the abdominal region with the possible separation of certain muscles,

such as the rectus abdominis. Women who have poor abdominal muscle tone prior to pregnancy are at a higher risk of separation of the rectus abdominis muscle. This condition is called diastasis recti and causes the muscles to become loose and have poor tone after delivery.

Diastasis recti may compromise postural stability and contribute to lower back and pelvic pain. If the pelvic floor muscles are also weak, urinary incontinence and dysfunction of the pelvic muscles may also occur.

Posterior pelvic pain (pelvic girdle pain)

Pelvic changes begin during pregnancy and while these changes resolve uneventfully in some women, others develop chronicity due to persistent symptoms, which may last for several months to years.

New mothers with posterior pelvic pain experience a continuous, dull pain in the lower back. Some women have more intense symptoms, such as sharp and stabbing pain.

Bruising, fracture, or dislocation of the coccyx

Coccydynia, the medical term for tailbone pain, is a condition that may affect women who have a difficult vaginal delivery due to a large newborn, excessive weight gained during pregnancy, or an instrumental delivery.

Coccydynia causes severe pain at the very bottom of the spine and makes activities such as getting up from a chair or bed painful.

Postpartum back pain may be a continuing symptom of pregnancy or develop as a new symptom after labor and delivery. Failure to adequately treat the symptoms may lead to chronic pain, affect daily functioning, and reduce the overall quality of life. Women are encouraged to seek medical attention to relieve the symptoms and address the underlying problem. Having a pain-free back after labor and delivery will help new mothers care for their newborn more effectively and enjoy the early phases of motherhood.

7. Spondylolisthesis

It is displacement of one vertebra over the another below it.

Types : 1. Anterolisthesis.

1. Posterolisthesis or retrolisthesis.

Anterolisthesis: Here the displacement is in forward or anterior direction.

Anterolisthesis can be classified on the basis of causes:

1. Degenerative Anterolisthesis: Occurs in older adults over 50 years of age.
2. Pathological Anterolisthesis: due to infection or malignancy.
3. Traumatic Anterolisthesis: Due to fracture eg. Road traffic accidents.
4. Isthmic Anterolisthesis: Defect in the pars interarticularis.
5. Dysplastic: Anterolisthesis is due to congenital abnormalities of the upper sacral facets or inferior facets of the lumbar vertebra.
6. Iatrogenic - Due to complication of surgery.

By severity:

Classification by the degree of displacement, as measured on percentage of the width of the vertebral body

Grade I	:	0 - 25%
Grade II	:	25 - 50%
Grade III	:	50- 75%
Grade IV	:	75- 100%
Grade V	:	More than 100%

Symptoms

1. Low back pain with pain radiation from buttocks to the back of thigh, and/ or leg and to foot along with the course of sciatic nerve.
2. Generalized stiffness over the lower back and back of thigh.
3. Change in posture

Diagnosis can be established by X-ray, CT scan, MRI

Treatment /Management

Asymptomatic cases don't need any treatment.

Conservative management:

Physiotherapy

Bracing

NSAIDS

Surgical Management :

Indications for surgery: Recurrent severe back pain with a persistence reduction of quality of life despite a reasonable trial of conservative (non-surgical) management

Worsening bladder or bowel symptoms

New or worsening neurological deficit

8. Spondylolysis

It is a defect or fracture in the pars interarticularis of the vertebral arch. Commonly it is found in the lumbar vertebrae. Rarely can it be seen in the cervical vertebrae also.

Symptoms:- Most of the cases are asymptomatic. The common symptoms are:-

1. Pain over one side of back. The onset may be gradual or sudden.
2. The pain may radiate into buttocks or legs.
3. Activities may worsen the pain.
4. Lordotic posture.

Causes:- hereditary and acquired risk factors such as strenuous activities. Males are affected more than females due to more strenuous activities in their young life. Athletes of young age are at higher risk. Spondylolysis may develop into Spondylolisthesis in many cases.

Diagnosis:-

x- ray

MRI

CT scan

Bone scan

Treatment:

Conservative management:-

Physiotherapy

Rest

Bracing

Surgical management: - when the symptoms do not relieve with conservative managements or the condition worsens to develop Spondylolisthesis of higher grade.

9. Scoliosis

It is a C or S shaped sideways curve in the back bone (spine). It is commonly observed during childhood or teenage for the first time.

The curve angle more than 10° on X-ray is considered as scoliosis.

Signs and symptoms:-

A visible spinal curve in back.

Uneven level of shoulders, waist or hip while standing.

Prominence (hump like) of rib cage on one side than other side.

One of the scapulae may appear bigger than the other.

Low back pain.

Stiffness in back.

Sensory disturbances in the leg(s).

Fatigue.

Types of scoliosis:-

1. Idiopathic scoliosis:- A scoliosis where cause of the curve is not known.

2. Congenital scoliosis:- this type of scoliosis develops before birth due to the defective growth of vertebral column. This is a rare condition which may be first seen only when the child is born. In some cases it is identified during teen years
3. Neuromuscular scoliosis:- disorder causing muscle weakness or paralysis like Spina bifida, cerebral palsy or spinal cord injury causes neuromuscular scoliosis. The weak or paralysed muscles fail to support the spine correctly, that leads the back to curve.
4. Degenerative scoliosis: - occurs in adults. Common at lower spine due to degeneration of disc or joints of the spine.

On the basis of structure it is categorized as

1. Structural scoliosis.
2. Nonstructural scoliosis.

Structural scoliosis:-Structural is the rigid curve, occurring due to the defective bone growth.

Nonstructural scoliosis:- the curve is flexible and reduces or goes away completely at certain posture or position. This occurs due to muscle weakness, rigidity, limb length discrepancy, inflammations are treated, and the scoliosis also goes away in most of the cases.

It commonly appears during growth age, usually between 10-15 years of age. Girls and boys are equally affected.

Diagnosis: - can be established by

X-ray

CT scan

MRI

Treatment:-

Conservative management: the nonstructural curves can be treated conservatively by Physiotherapy, bracing and proper training.

Surgical management:-

Rigid or structural curves require surgical intervention.

Congenital scoliosis having suggestive radiological signs of fast progression of the curve, scoliosis causing severe back pain and disability.

10. Transitional Vertebra

Lumbarization and sacralization:

The first and second segments of sacral vertebra fails to fuse. The lumbar spine appears to have six vertebrae instead of five. The sixth vertebra is called transitional vertebra. The sacrum as a result has four vertebral segments instead of five.

Sacralization. The fifth lumbar vertebra is fixed with sacrum on one or both sides, or to ilium or both.

Though it may cause lower back pain. It is asymptomatic in many cases.

Diagnosis : X-ray, CT scan, MRI

Treatment: Physiotherapy, Bracing, NSAIDS

11. Ankylosing Spondylitis

It is progressive inflammatory stiffening of joints.

Age of onset 15-30 years.

It mainly starts with axial skeleton specially sacroiliac joint and is characterized by progressive inflammatory stiffening of sacroiliac joint and progress upwards.

The hip, knee and the manubrio-sternal joints are frequently involved. It leads to the ossification (bone formation) of ligaments of spine and bony fusion occurs giving a bamboo like appearance of spine on x-ray. The pain may subside after the fusion and the spine is permanently stiff.

Diagnosis: mainly clinical others, x-ray, presence of HLAB 27.

Treatment:

Medical and physiotherapy may help to have a comfortable life.

12. Osteomalacia

Osteomalacia means "soft bones." Osteomalacia is a disease that weakens bones and can cause them to break more easily. It is a disorder of decreased mineralization, which results in bone breaking down faster than it can re-form. It is a condition that occurs in adults.

Pain in bones and hips

Bone fracture

Muscle weakness

Difficulty in walking

Diagnosis

Low level of Vitamin D in blood, Low levels of calcium or phosphate level.

BMD (Bone Marrow Density)

X-ray

Treatment :

- Braces to support the bones from deformation or fracture.
- Supplements of Vitamin D calcium or phosphate depending on the individual case.
- Surgery to correct deformity.
- Adequate exposure to sunlight.

13. Vertebral fractures

Osteoporosis is a silent disease. There won't be any symptoms until a fracture occurs. Such fractures are commonly compression fracture.

Typical symptoms of compression fracture are:

Sudden onset of back pain.

Pain worsens with standing or walking.

Rest improves the pain intensity

Reduced spinal mobility.

Loss of height.

Deformity of spine and disability

Treatment

Treatment includes immobilization, Physiotherapy and analgesics for pain relief.

14. Tuberculosis / Pott's Spine

Spinal tuberculosis is a destructive form of tuberculosis. It accounts for approximately half of all cases of musculoskeletal tuberculosis.

Spinal tuberculosis is more common in children and young adults.

Characteristically, there is

destruction of the intervertebral disk space and the adjacent vertebral bodies,

collapse of the spinal elements,

anterior wedging leading to kyphosis and gibbus formation.

The thoracic region of vertebral column is most frequently affected. Formation of a 'cold' abscess around the lesion is another characteristic feature.

Common clinical manifestations include constitutional symptoms,

back pain,

spinal tenderness,

paraplegia, and

spinal deformities.

Diagnosis of spinal tuberculosis magnetic resonance imaging is more sensitive imaging technique than x-ray and more specific than computed tomography. Magnetic

resonance imaging frequently demonstrates involvement of the vertebral bodies on either side of the disk, disk destruction, cold abscess, vertebral collapse, and presence of vertebral column deformities. Neuroimaging-guided needle biopsy from the affected site in the center of the vertebral body is the gold standard technique for early histopathological diagnosis.

Management

Antituberculous treatment remains the cornerstone of treatment.

Surgery may be required in selected cases, e.g. large abscess formation, severe kyphosis, an evolving neurological deficit, or lack of response to medical treatment. With early diagnosis and early treatment, prognosis is generally good.

15. Spina bifida

Spina bifida is a birth defect of neural tube. Embryonic neural tube develops into the baby's brain, spinal cord and the tissues that encloses them. This defect can occur at any level on the spine and it may cause physical and cognitive disorders. It can be mild to severe depending on:

1. whether skin covers the affected area.
2. Level of spinal nerve exiting from the affected area of the spinal cord.
3. Size and location of the defect.

Types

2. Spinal Bifida occulta (occulta means hidden):

It results in a small gap in the small gap in one or more vertebra is spina bifida occulta. It is the mildest form of spina bifida.

The skin is closed and there is no opening on the infants back and the spinal nerves are normal (commonly). Signs and symptoms are not much and neurological signs and symptoms are also not present.

Many people having spins bifida occulta comes to know about this only during an imaging test (X ray) done for unrelated reasons.

This type doesn't cause any disability.

Meningocele:

The sac protrudes from the infants back via an opening in the vertebra. The protruded sac is filled with fluid. It doesn't contain the spinal cord. Nerve damage in meningocele is less obvious. Minor disabilities may be present. This is a rare form of spina bifida.

Myelomeningocele: This is most severe form of spina bifida.