

BACK PAIN

Introduction

Back pain is pain felt in the back that could originate from the muscles, nerves, bones, joints or other parts of the spine.

The pain can often be divided into neck pain, upper back pain, lower back pain or tailbone pain. It may start suddenly or may gradually increase; it can be constant or intermittent, stay in one place or radiate to other areas. It may be a dull ache, or a sharp or piercing or burning sensation. The pain may be felt in the neck (and might radiate into the arm and hand), in the upper back, or in the low back, (and might radiate into the leg or foot), and may include symptoms other than pain, such as weakness, numbness or tingling.

Back pain has achieved epidemic proportions world wide in the last two decades. However the good news is that most episodes of back pain will last only a short time, up to 75 % will recover in 3 months, only 1-3 % of back pain patients ever require surgery and that lifestyle changes help.

There are many prevailing myths about back pain like: stay in bed, you need prescription drugs to get relief, stay away from surgery because it has very poor results and high complication rate, you should have restricted activities for life and you can never get back to a normal lifestyle. These myths often put these people off track and hinder proper management. Let's know more about back pain.

Epidemiology

80 – 85% of people will suffer from a significant low back pain at some point of their life time, In US it is the second most common ailment after common cold. What compounds this bad news is the fact that nearly 70% of sufferers will have a recurrence within one year of the initial episode. It also drains the economy since it is responsible for the highest number of man hours lost in the industry. However the good news is that most episodes of back pain will last only a short time (upto 75% recover in three months).

Even though there is no proper epidemiological study in India we could anticipate that the incidence and prevalence in India would be the same as in the Western Countries. Most of the predisposing factors are equally, if not more, prevalent in the Indian population as the lifestyles have changed predominantly.

Predisposing factors:

The two factors mainly responsible for the increased incidence of back pain are

- Sedentary life styles, and
- Improper posture

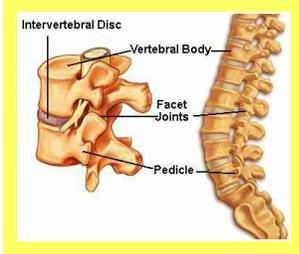
Other high risk factors for back pain include:

- Professions requiring sedentary work /prolonged improper posture
- Obesity
- Stressful life style, and
- Previous history of back pain.

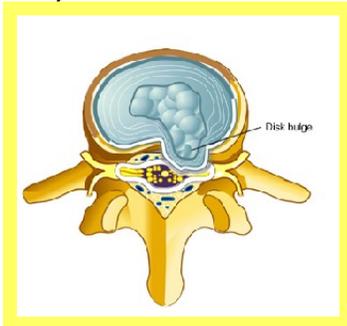
Causes of Back Pain

Some common causes of back pain are as under:

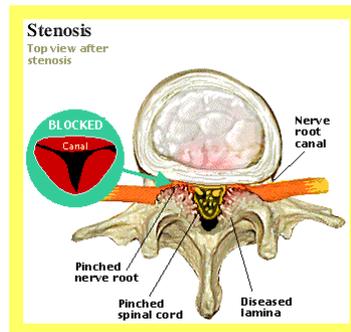
1. **Mechanical back pain** – This is the most common cause of back pain. Weak or strained muscles and ligaments are not able to support the back thus leading to pain.



2. **Nerve root pain** is that due to pressure on the nerve, often due to a herniation (or bulging) of the disc between the lower back bones. Sciatica is an example of nerve root pain. Such pain tends to be sharp, in one spot, and associated with numbness in the area of the leg that the affected nerve supplies. Herniated discs are produced as the spinal discs degenerate or grow thinner. The jellylike central portion of the disc bulges out of the central cavity and pushes against a nerve root. Intervertebral discs begin to degenerate by the third decade of life. Herniated discs are found in a third of adults older than 20. Only 3% of these, however, produce symptoms of nerve impingement.

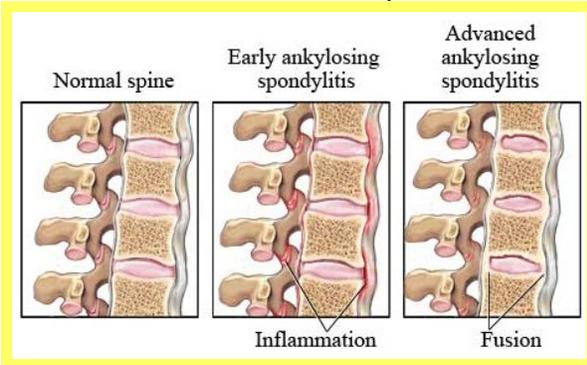


3. **Spinal stenosis** – With changes of ageing, the size of the canal in which the nerve lie and the opening through which they come out of the spine gradually reduces leading to pressure on the nerve roots. This can result in sciatica. Classically, the leg pain increases as the person walks further forcing the individual to sit down. After a while of rest the person can again walk for around the same distance. With time the distance which the individual can walk gradually reduces.



4. **Degenerated Disc Disease** – With changes of ageing, the disc gets degenerate and gradually loses its normal function. This could also be the cause of pain.
5. **Infections** – Infections like tubercular or bacterial infection can result in back pain. They may also cause weakness in the legs due to pressure on the nerves by the pus and infected bone/soft tissue. Infections are generally associated with fever.

6. **Inflammation** – There are some conditions in which anti-bodies are formed against one's own joints and tissues. Rheumatoid arthritis, ankylosing spondylitis etc are some such conditions. Back pain is accompanied by morning stiffness.



7. **Tumors**, possibly cancerous, can be a source of skeletal pain.
8. **Referred pain from other organs:** Pain from other organs may also be felt in the back. This is called referred pain. Many intra-abdominal disorders-such as appendicitis, aneurysms, kidney diseases, bladder infections, pelvic infections, and ovarian disorders, among others-can cause pain referred to the back.

Diagnosis:

Medical history: Because many different conditions may cause back pain, a thorough medical history is taken as part of the examination.

Your doctor will first ask you various aspects pertaining to the pain including many questions regarding how the pain started, (Were you lifting a heavy object and felt an immediate pain? Did the pain come on gradually?), what makes the pain better or worse, the "red flag" symptoms, previous history of pain, recent illnesses and associated symptoms such as fever, difficulty in bowel or bladder control etc.

Physical examination: This is done to test the nerves, strength of muscles, and presence of stretch on the sciatic nerve.

Imaging: Doctors can use several tests to get an idea of what might be causing the back pain. No single test is perfect in that it identifies in every case the absence or presence of disease. If there are no red flags, there is little to be gained in imaging acute back pain. Because about 90% of people have improved within 30 days of the onset of their back pain, most doctors will not order tests in the routine evaluation of acute, uncomplicated back pain. Since a significant percentage of normal persons will show changes in various imaging modalities, the investigations should be co-related clinically. Just the mere presence of changes on imaging does not mean that we should start the treatment unless it co-relates with some symptoms and clinical findings. There may be some exceptions to this like infection and tumors. However these exceptions are quite uncommon.

Plain x-rays are generally not considered useful in the routine evaluation of back pain, particularly in the first 30 days. Their use is indicated if there is significant trauma, mild trauma in those older than 50 and for those with osteoporosis.

Magnetic resonance imaging (MRI) scans are useful for evaluation of back pain. They are used to evaluate chronic back pain or that associated with red flags.

CT scan is an x-ray test that is able to produce a cross-sectional picture of the body. CT scan is used much like MRI.

Nerve tests: Electromyogram or EMG is a test that involves the placement of very small needles into the muscles. Electrical activity is monitored. Its use is usually reserved for more chronic pain and to predict the level of nerve root damage. The test is also able to help the doctor distinguish between nerve root disease and muscle disease.

Red flags in back pain management

About 70% of patients with back pain get better within 3 months time even if no treatment is given. However there are certain symptoms which indicate the possibility of some serious underlying spinal pathology and the need to be immediately evaluated by a doctor. Even though they are seen in only a small percentage, one should be aware of these red flags so that any serious underlying problems can be detected and managed early in order to ensure the best possible results. These red flags include:

- ◆ **Back Pain of more than 6 weeks duration** – Pain should generally subside within this duration. If it doesn't, evaluation to rule out a serious underlying pathology becomes essential.
- ◆ **Back Pain radiating to one or both legs till below the knee** – This suggests a pressure on the nerves which is generally due to a disc bulging or protruding back from its position. In elderly it is generally due to age related narrowing of the canal in which the spinal cord and the nerve root lies. Sometimes the radiation of the pain can be due to tumor, infection or other diseases affecting the nerves like diabetes, vitamin D deficiency, etc.
- ◆ **Associated symptoms of fever, weight loss, loss of appetite and malaise** – These symptoms generally suggest an infection. Tuberculosis of the spine has become quite common due to generalized reduced immunity of the society. Patients present with back pain and especially an evening rise of temperature. Significant associated weight loss without fever can be manifestation of a cancerous tumor.
- ◆ **Morning stiffness with or without pain in other joints of the body** – This suggests an inflammatory condition like Ankylosing Spondylitis or Rheumatoid Arthritis. As opposed to mechanical pain, which gets better with rest and increases with activity, inflammatory pain increases after rest and gets better with some activity. Inflammatory pain is managed with specific medications.
- ◆ **Associated weakness in the legs and/or partial/complete loss of bowel/bladder control** – This suggests pressure on the spinal cord/ nerves which may be due to infection, tumor, large disc bulge etc. or diseases of the spinal cord/nerves. Progressive weakness of legs and bowel/bladder involvement becomes an emergency.
- ◆ **Significant trauma** – A fracture of the vertebra can cause weakness/paralysis by pressure on the spinal cord/nerves and should be detected in time.

MANAGEMENT

There are two parts of management of back pain – taking care of the pain and reducing the chances of recurrence.

I. Pain management

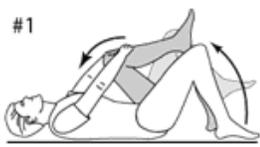
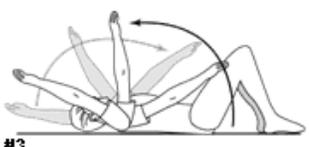
Pain is managed by local application of heat / ice packs, massage, anti-inflammatory drugs, corsets, physiotherapy, acupuncture / acupressure or local injections. However these provide only temporary relief and are unproven to have a long term impact on the natural history of the disease.

Aerobic physical conditioning (through walks, swimming, treadmill, stair climbing, cycling and other general conditioning exercises), patient education and surgery are proven treatments which change the natural course of the disease. However, only 1-3% of back pain sufferers ever require surgery.

Conservative treatment:

Physical therapy: consisting of manipulation and exercise. Aerobic physical conditioning (through walks, swimming, treadmill, stair climbing, cycling and other general conditioning exercises) is a proven treatment which changes the natural course of the disease.

Stretching and strengthening (with specific focus on the muscles which support the spine) are also important but should be started under supervision of an expert, preferably a physiotherapist.

BACK EXERCISES		BACK EXERCISES (Contd)	
			
#1 Simply get in the above position and GENTLY pull your knee to your chest and hold for 5 seconds. And repeat the other side. Do each leg 10 reps/ session and 2 sessions/ day. DO NOT do this if you have bad knees or if it aggravates your pain!	#2 Simply suck / contract your belly-button downward (NOT by deeply inhaling!) and lifting your butts/ trunk up. IF you're really in pain (acute) DO NOT DO any of the exercise that aggravates it. Hold for 5-7 seconds, doing 10 reps/ session and 2 sessions/ day is plenty.	#5 Do not use pillow below tummy DO NOT DO THIS ONE IF YOU HAVE A BAD NECK! Use a little pad for the forehead. Slowly raise your left arm (keeping it straight) upward and HOLD it at the top for 5 to 7 seconds. Slowly lower and repeat with the other arm. Only raise your arm to a comfortable height. You don't have to go very high for this to be effective. Doing 10-15 reps/ session and 2 sessions/ day is enough.	#6 Do not use pillow below tummy Slowly raise your left leg (keeping it straight) upward and HOLD it at the top for 5 to 7 seconds. Slowly lower and repeat with the other lower limb. Only raise your leg to a comfortable height. DON'T go so high that you're causing a lot of pain. You don't have to go very high for this to be effective. Doing 10-15 reps/ session and 2 sessions/ day are enough.
			
#3 Assume the position as same in exercise 2 and then put one arm straight over-head and the other arm down by your side (swimming movement) Hold for 5-7 seconds, doing 10 reps/ session and 2 sessions/ day is enough.	#4 Assume the above position only the grey leg is down (like the white). Do cycling alternatively and as demonstrated. Doing 10 reps/ session and 2 sessions/ day is enough.	#7 Do not use pillow below tummy DO NOT DO THIS ONE IF YOU HAVE A BAD NECK! Simultaneously lift the white arm (left) and grey leg (right) slowly upward. Don't force it! Just go as high as you can. Hold this top position for 5 to 7 seconds and then lower. Repeat the other limb pair. Doing 10-15 reps/ session and 2 sessions/ day with each limb pair (white arm - grey leg) is good enough.	

Physiotherapeutic modalities like Interferential Therapy (IFT), Transcutaneous Electrical Nerve Stimulation (TENS), and Short Wave Diathermy (SWD) etc. can be used to manage pain and increase microcirculation locally.

Manipulation: as provided by an appropriately trained and qualified chiropractor, osteopath, physical therapist, or a physiatrist. Studies of the effect of manipulation suggest that this approach has a benefit similar to other therapies and superior to placebo.

Acupuncture: One of the oldest forms of therapy, has its roots in ancient Chinese philosophy. Traditional Chinese medicine is based on a number of philosophical concepts, one of which postulates that any manifestation of disease is considered a sign of imbalance between the yin and yang forces in the body. In classical acupuncture theory, it is believed that all disorders are reflected at specific points either on the skin surface or just beneath it. Vital energy circulates throughout the body along the so-called meridians, which have either yin or yang characteristics. A correct choice for needling among the 361 classical acupuncture points located on these meridians is believed to restore the balance in the body.

Education: Education about back pain and how to manage it is another proven treatment and hence a very important component of management.

Surgical Management

Surgery for disc problems

To determine who would benefit from back surgery to decompress a nerve due to pressure from a herniated disc, the following criteria are usually accepted by most physicians. The individual must:

- Have a disc pressing on a nerve root, as shown by an MRI or CT scan
- Have consistent pain despite conservative treatments, including a prescribed exercise program
- Have severe pain radiating into the buttock or leg, (sciatica) that does not decrease with conservative treatment such as physical therapy and medication, after 4 to 6 weeks of conservative treatment
- Have neurological warning signs, like loss of an ankle reflex or the loss of urinary control (which is a surgical emergency)

There are several options for relieving pressure on a compressed nerve root:

Discectomy - Discectomy is one of the most common back operations. It involves removing the protruding disc, either a portion of it or all of it, that is placing pressure on the nerve root. This operation has a very high rate of success. In the classic discectomy, the surgeon makes a small incision over the disc to be operated upon, and removes only the disc material that is pressing on a nerve.

Microdiscectomy - Microdiscectomy is similar to discectomy except that it is done with the use of magnification such as an operating microscope and requires a smaller incision. The surgeon removes the disc, freeing the compressed nerve. Microdiscectomy often requires shorter hospital stays.

Endoscopic disc removal - This procedure involves removing the problem disc fragment through an endoscope - a small tube inserted through a tiny opening in the skin of the back. A miniature video camera is attached to the tube. Using specially designed surgical instruments on the end of the tube, a surgeon can cut away parts of the disc and remove them by suction through the tube. This leaves structures important to stability practically unaffected.

Laser disc decompression - Laser disc decompression involves an approach similar to endoscopic disc removal. However, laser energy is used to remove the disc tissue. The laser

energy is introduced through a needle to destroy a small amount of nucleus pulposus, thereby reducing the pressure on the nerve. Laser disc decompression is a relatively noninvasive procedure that takes place in an outpatient setting, and it is performed under local anesthesia with a short treatment time of approximately 30 minutes. However, results using this technique at this stage have not been impressive.

Surgery to stabilize the spine

Spinal fusion is a process in which two vertebrae are joined together. Bone grafts are placed between or alongside the vertebrae, to join the bones together. Metal plates and screws are often used to attach the bones to be joined as an internal brace. Fusion occurs when the adjacent bones grow together to form a single bone. A single level may be fused, (for example, the vertebrae across one disc space) or multiple levels, depending on the condition. This approach can return normal alignment and strength between the vertebrae in individuals whose intervertebral structures are unstable because of a fracture or other condition such as spondylolisthesis. A new fusion technique employs a small hollow metal cage that is packed with bone graft and placed in the disc space.

Surgery to create more space in the Spine.

Laminectomy is a surgical procedure that involves removing the laminae parts of the vertebrae. These are the areas of bone in the back of the vertebrae. When the lamina is removed, more space is created in the spinal canal. This decompresses (that is, takes the pressure off) the nerves or spinal cord. This procedure is especially helpful for people with spinal stenosis, in which the narrowed spinal canal lacks adequate space for the spinal cord or nerves, causing pain in the back and buttocks and weakness in the legs. Laminotomy refers simply to the creation of a small window in the lamina, rather than removing the lamina, in order for the surgeon to reach the disc or spinal canal. This is commonly done when performing a discectomy (removing a disc).

II. Recurrence rate reduction:

This involves removal of predisposing factors through general physical conditioning exercises, specific back exercises, proper posture in everyday activities and controlling any interfering psychosocial, professional or personal emotional factors.

Multidisciplinary team management for chronic back pain:

If the pain becomes chronic, management by a multidisciplinary team is required. This team could comprise of the following disciplines:

1. **Orthopedic surgeon/physiatrist** - Does a detailed evaluation including taking proper history, examination of the patient and prescribing necessary diagnostic tests. The same doctor could prescribe the necessary medication and co-ordinate the management of the patient with the support of other members in the multidisciplinary team. He/she is generally also responsible for patient education.
2. **Pain Physician/Anesthetist** - for suitable blocks, local steroid injections, transformational/inter-laminar epidural injections etc when conservative treatment fails.
3. **Physiotherapist** - For pain relief with various modalities like IFT, TENS and other forms of heat therapy, posture counselling, counselling for general conditioning, resistive and stretching exercises.

4. **Occupational Therapist** – To work upon various postures and positions in which the pain is minimum and suggest simple biomechanical principles, which would put the least stress on back for any particular activity.
5. **Orthotist** - For any Brace to be used temporarily if the patient gets relief with it size and till the pain becomes bearable.
6. **Acupuncturist** - For acupuncture.
7. **Psychologist** - For taking care of psychosocial components
8. **Yoga therapist**
9. **Naturo-path** – Work upon patients who are comfortable with such therapy.
10. **Vocational Counseling** - To suggest suitable changes in the vocation if required.
11. **Social Worker** – To mediate with the employers for job related issues.
12. **Spiritual Counselors** – to explore ways to minimize any psychosocial component and to empower them to accept any chronic disability due to the pain.
13. **Spine Surgeon** – if any surgery is required.

The multidisciplinary team is often involved in providing group therapy to chronic patients but only after they have been worked up individually. Patients' education classes are taken by various members of the team with a goal of making the patient well versed with all aspects of back pain so that he/she could become the manager of his/her own problem. Management is done according to a protocol which could be modified for individual patients in order to achieve the best results in a cost effective manner. It must be pointed out that different people have different requirements with regard to day to day activities and hence goals would need to be planned accordingly for each patient.

Summary

To summarize, even though the incidence of back pain has reached epidemic proportions, it can often be managed easily. The patient needs to be educated so that he / she can become the manager of his / her problem. Lifestyle changes are important to prevent back apin and to reduce the chances of recurrence.
