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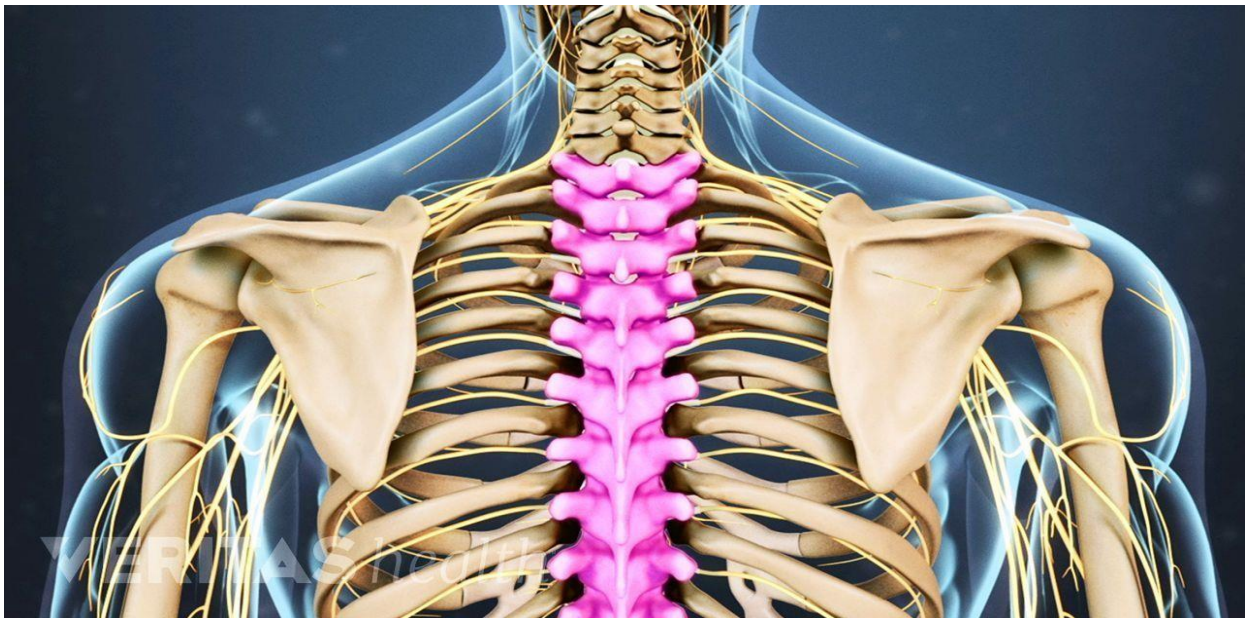
Low Back Pain (LBP)

Introduction:-

- Second most common reason to seek medical attention
- About 15% adults are disabled due to spine problem
- Most common disability below 45 years of age
- Bed rest need not extend beyond a week
- 80% patients improve within 1month
- 80% sciatica recurs
- Commonest cause of sickness absenteeism in USA & UK
- Financial losses approx. $ 80 bn in USA per year!!

Anatomy of spine: -



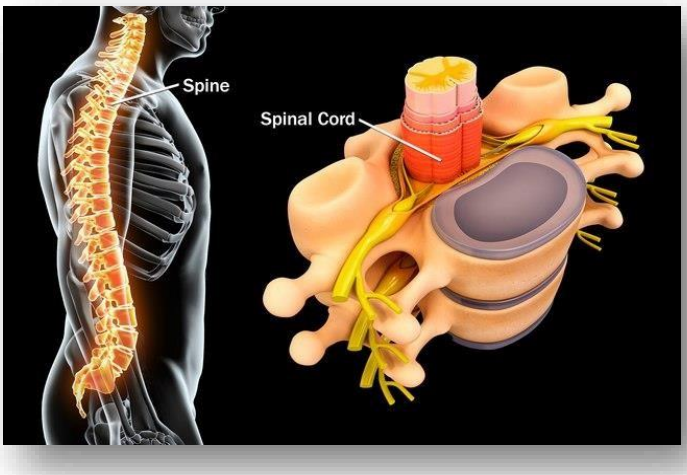
Human beings have paid the price of erect posture in the form of acquiring LOW BACK PAI

What is spine? :-

Spine is the unique anatomical entity which forms the axis of the human body.The head rests on it, the neck, chest and abdomen are suspended on it It transfers the weight of upper body to the lower body.

Its uniqueness lies in a perfect

balance of flexibility and stability



Its **constituents** are

- ❖Vertebral body
- ❖Facet joints, Discs
- ❖Ligaments
- ❖Fatty tissue
- ❖Neural tissue (Spinal cord & nerve roots)
- ❖Venous plexuses

Spinal cord and nerve roots are protected within the spinal canal

Intervertebral disc:-

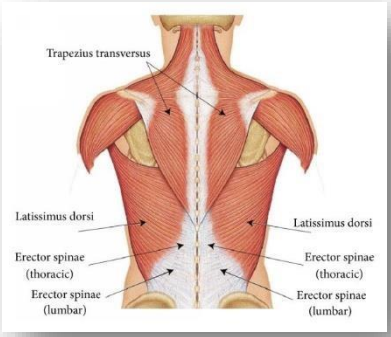
Intervertebral disc consists of nucleus pulposus (central part) which is a soft jelly like, biconvex structure under great intrinsic pressure surrounded by tough covering of interlacing fibres (annulus fibrosus) akin to a car tyre

- Largest in cervical and lumbar regions
- Discs are elastic in youth
- Elasticity is lost with advancing age
- Acts as shock absorber during walking & running
- Acts as ball bearing between vertebral bodies

Muscles :-

➢ Para spinal muscles

- ✓ Functions
  - ✓ Extension of spine
- ✓ Maintain upright posture loading

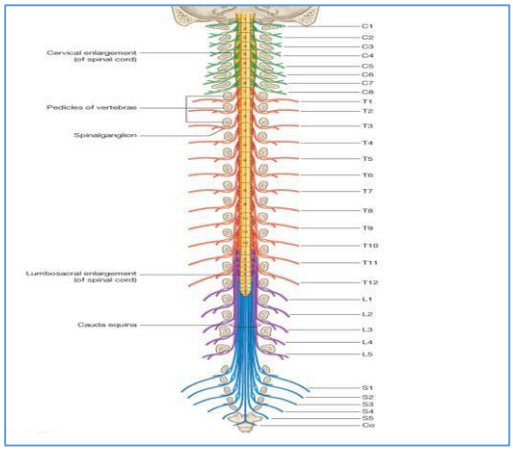


➢ Abdominal muscles

- ✓ Functions
- ✓ Flexion and lateral bending
- ✓ Strongest safeguard during spine loading

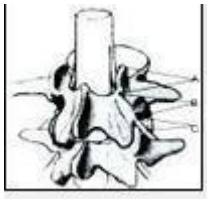
CAUDA EQUINA:-

Terminal part of spinal cord i.e. conus medullaris, filum terminale and bunch of lower spinal nerve rootlets together form "Cauda equina" (tail of horse) It provides



- Power and sensations of lower limbs
- Spinal Centre for bladder and bowel control
- Centre for sexual function
- Perineal sensations

Normal lumbar canal:-



Is constituted by vertebral bodies, intervertebral disc in front, laminae & spinous processes behind, and pedicles laterally

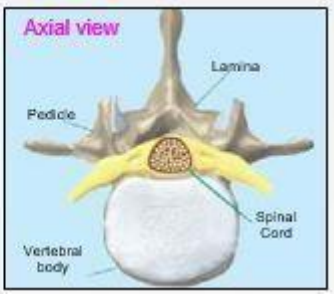
Average sagittal (AP) diameter : 15 to 25 mm Average interpeduncular (trans.) diameter: 20 to 25 mm Average thickness of ligamentum flavum : 4 to 6 mm

Three zones of lateral recess

A) Entrance zone B) Mid zone C) Exit zone

PAIN SENSITIVE STRUCTURES IN THE BACK:-

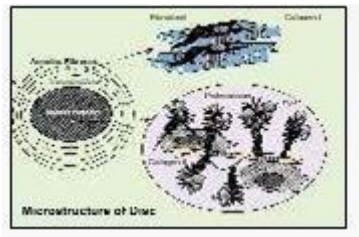
- Para spinal muscles
- Ligaments (elastic bands holding bony components)
- Bones



- Vertebral bodies
- Facet joints
- Intervertebral discs
- Nerve roots

- Spinal Dura

TYPES OF PAIN:-



- Mechanical local back pain
- Radiculopathy
- Referred pain

MECHANICAL LOW BACK PAIN

Commonest variety of back pain, resulting from strain in paraspinal muscles, ligaments, or irritation of facet joints

RADICULOPATHY (SCIATICA)

Located in the back

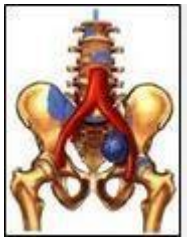
Radiates> buttocks> leg(s)> foot

- Confined to one dermatome
- Affected by faulty posture, sneezing, coughing and straining
- May be associated with sensory / motor disturbance in lower limbs

"**Branding" marks at site of pain indicating dermatomal distribution**

REFERRED PAIN :-

- Originates from abdominal diseases such as pancreatitis retroperitonial neoplasms, and pelvic diseases & gynaecological conditions like pelvic inflammatory disease, pelvic tumors, and even pregnan ❖ Unaffected by posture.



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ASSOCIATED SYMPTOMS :-

- Weakness of muscles innervated by involved nerve root(s)
- Hypoaesthesia of involved nerve root(s)|

- ❖ Cauda equina syndrome
  - Perianal hypoaesthesia
  - Urinary incontinence
  - Fecal incontinence

Biomechanics of spine :-

Basic function of spine is transmission of load placed on head, trunk and extremities. It permits sufficient movement of members to allow physiologic movement , resisting abnormal ones.

What is `motion segment` in spine?

It consists of two adjacent vertebrae and interconnecting ligaments, disc and capsules

Degree of freedom

Implies number of unique independent motions that one vertebra can have with respect to another

Two types of Degree of freedom :-

Translational - can be forward / backward, up/down, side to side

Rotational - can be flexion/ extension, lateral flexion on both sides or axial twist to right/ left

Regions	Divisions	Movements
Atlanto Occipital	C0 - C1	Most of the Lateral bending
Upper cervical	C1 – C2	Most of the axial rotation
Mid cervical	C2 – C5	Flexion is evenly distributed over whole cervical spine
Lower cervical	C5 - T1	
Upper dorsal	T1 - T4	Upper thoracic spine has more axial rotation
Mid dorsal	T4 - T8	Lateral bending is evenly distributed
Lower dorsal	T8 - L1	Lower thoracic spine has more flexion extension
Upper lumbar	L1 - L4	Large amount of flexion and extension is evenly distributed
Lower lumbar	L4 - L5	
Lumbosacral	L5 - S1	

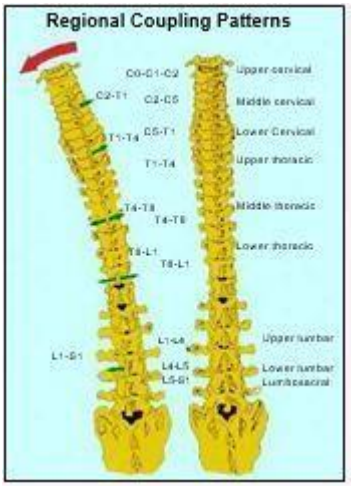
Thoracic spine acts as transition zone of biomechanics from cervical to lumbar region :-

Coupling is property of spine to move by rotation or translation about one axis when subjected to a load about another axis

In upper cervical region, there is association between axial rotation and axial translation due to anatomy of lateral articulation

In lower cervical region, lateral bending to one side will result in rotation of spinous processes to **opposite** side

While in lumbar region coupling between lateral bending and rotation result in rotation of spinous processes to **same** side



INDIVIDUAL SPINAL COMPONENTS :-

VERTEBRAL BODY :-

Cervical vertebral body can sustain pressure of 1500N, while lumbar vertebral body can sustain 8000 N (Newton, SI unit)

Vertebral endplates fail first in degenerative disorders

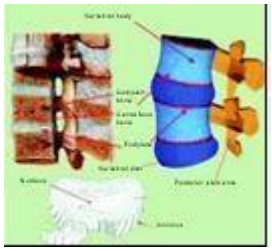
Brunt of weight sustained by part of vertebral body:-

	Below 40yrs	Above 40yrs
Cortical bone	45%	65%
Cancellous bone	55%	35%

DISC :-

Position of body	Percentage of load over disc
Supine	25%
Standing	100%
Sitting	140%
Sitting with forward bending	180%
Forward bending	220%
Forward bending and carrying weight	275%

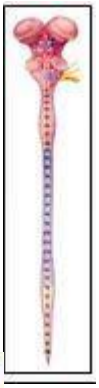
LIGAMENTS :-



They have dual function of allowing movement in physiological limits while resisting motion beyond it

Rich in elastic fibres, ligamentum flavoum streches by 35% in full extension while decreases in length by 10% in full extension

SPINAL CORD :-



Is a mobile structure suspended from brain and supported by nerve roots and dentate ligaments

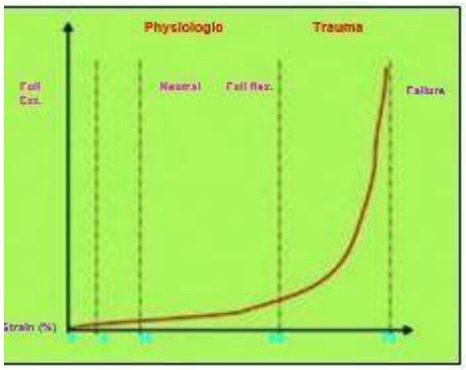
Motion results in folding or unfolding of spinal cord within the normal range

Beyond the normal range it adapts itself by the deformation of cord and nerve roots.

Cord can lengthen by 10% with compensatory reduction in cross sectional area

SPINAL INSTABILITY :-

It is loss of ability of Full the spine Neutral to Full flex. maintain relationship between vertebrae Ext. in such a manner that there is neither damage nor subsequent irritation of the spinal cord or nerve roots under physiologic load



Causative factors of lbp :-

Congenital :-

➢ Spina bifida occulta

Defective fusion of midline during embryonic development

Present since birth

Usually asymptomatic, but may present with stigmata in the form of tuft of hair, sinus(es) over back, gradually progressing weakness, limb deformities & bladder/ bowel involvement

➢ Myelomeningocele :-

Swelling over low back with/ without paraparesis and bowel/bladder involvement

Detected soon after birth

Prenatal USG, fetal MRI can detect these defects even during pregnancy

SPINA BIFIDA, A PREVENTABLE CONDITION!

By supplementing Folic acid tablets right from preconception period

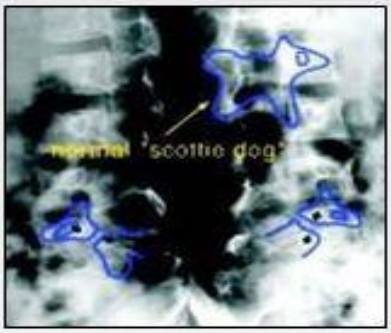
It has been a National program of folic acid supplementation for all females of childbearing age in some countries

FOLIC ACID IS FOUND IN THE FOLLOWING FOODS : FORTIFIED BREAKFAST CEREALS DALS ASPARAGUS SPINACH PEANUTS ORANGE JUICE ENRICHED BREADS AND PASTA ROMAINE LETTUCE BROCCOLI CHICKPEAS PAPAYAS PEAS ORANGES STRAWBERRIES

Spondylolysis(= Isthmic Spondylolisthesis):-

Due to fracture of pars interarticularis

May be congenital, fatigue fracture, acute traumatic fracture or degenerative



Occupational


Coolies


Traffic police


Sherpas


Tractor driver


Rickshaw puller


Weight lifter


Fast bowler


Stuntman

38% of LBPs are occupational in nature.

Adopt correct postures during work/sport. Correct faults, weak spots, or give up the

P
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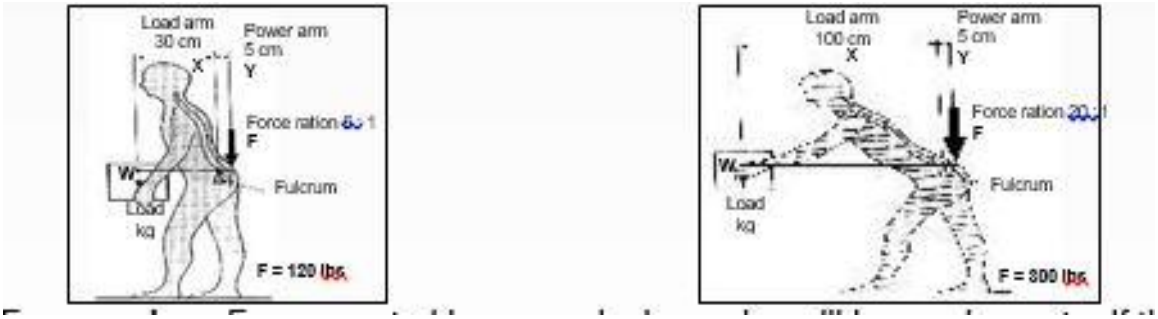
work /sport if the spine can't be trained, supported or protected.



Ergonomics :- - Force exerted by paraspinal muscles will be much greater if the weight is lifted further away from the body.

Traumatic

Acute disc rupture

Trivial injury can rupture an already diseased disc

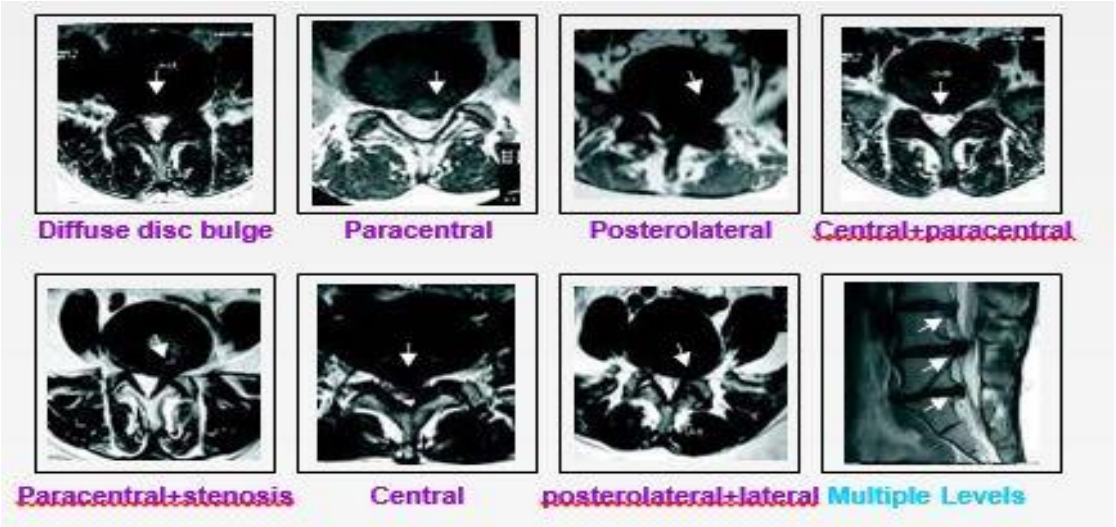
Strong impact such as vehicle accident can traumatize even a normal disc

Manifests as severe low backache. May radiate to lower limbs.

Occasionally causes muscle weakness/sensory deficit in lower limbs, and in advanced prolapse even leads to bladder/bowel involvement

Varied patterns of disc prolapse :-

Single level

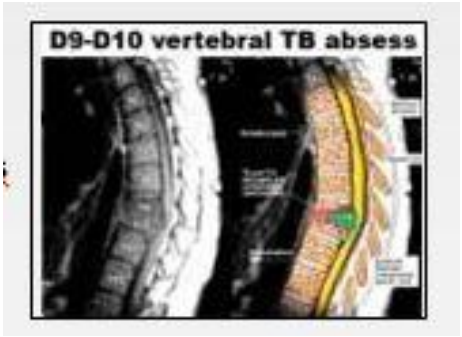


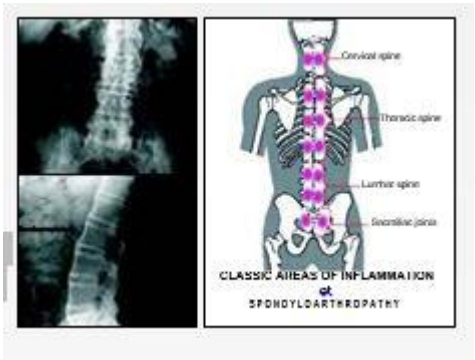
- **Vertebral Fracture**

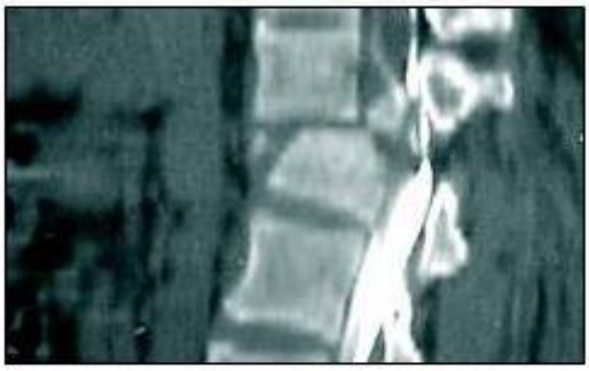
Commonly caused by vehicular accidents, fall from height

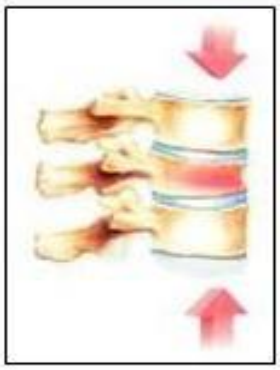
In the elderly, trivial trauma leads to fractures due to underlying osteoporotic changes, or metastatic tumors

Presents with sudden onset of excruciating backache with or without neurological deficit









Inflammatory

- **POTT'S/ KOCH`S /TB Spine**

Common condition in the third world countries

Increase in prevalence due to epidemic of HIV

Presents with low backache, weight loss, fever with or without neurological deficit

- **Spinal epidural abscess**

Common complication of Koch's spine

Manifests with low-grade fever, backache, paraparesis and bladder/bowel involvement

Ankylosing spondylitis

Nonspecific immunological disorder with fusion of intervertebral joints due to inflammation • Seen in early age group in the form of low backache, progressive difficulty in bending, `**sacroiliaitis**` reduced spinal mobility & chest expansion

Classical **"Bamboo spine"** on plain radiographs.

METABOLIC

Osteoporosis / Osteomalacia –

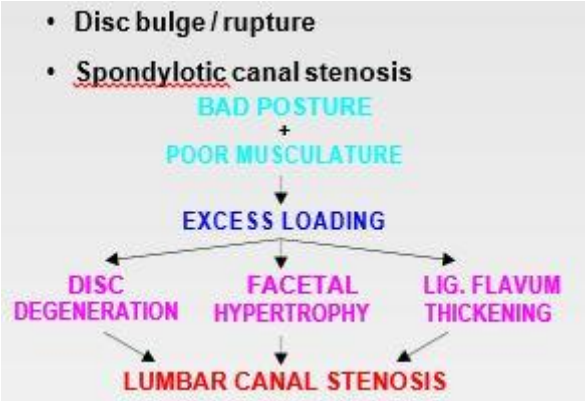
Causes reduction in strength of both cancellous as well as

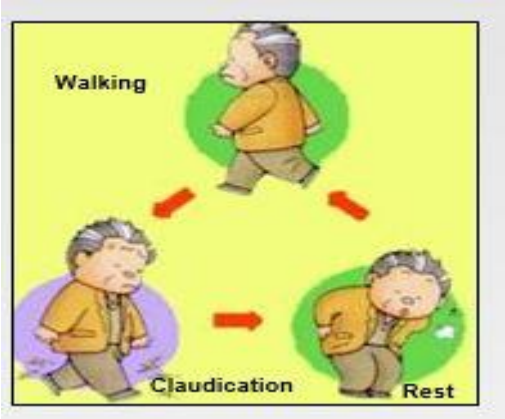
cortical bone • Pain worsened by prolonged sitting / standing hence the need to keep changing postures • 25% osteoporosis weakens the bone by 50%!

Osteopetrosi

Genetic Heterogenous group of bone remodelling disorder · Increase bone density due to decreased osteoclastic bone resorption · Propensity to fracture is high

Degenerative





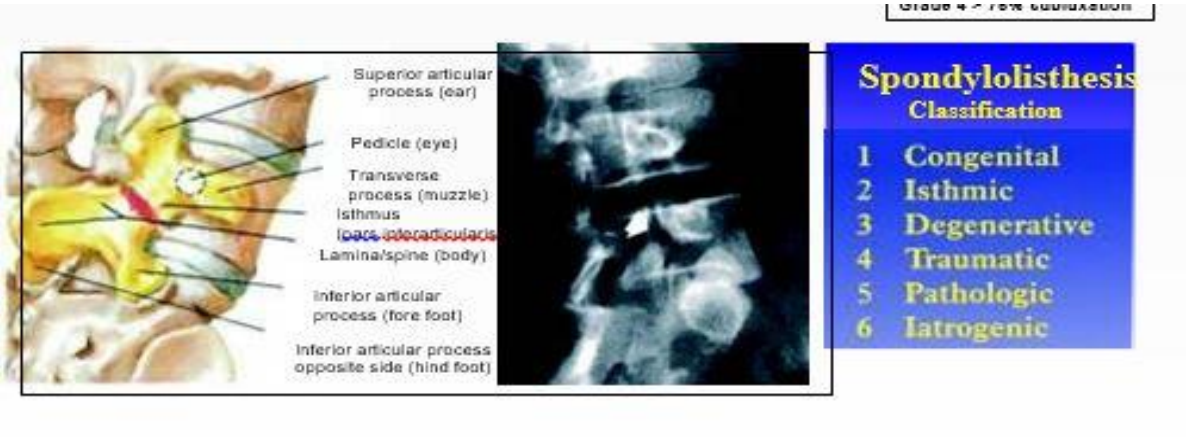
Excessive loading results from forces acting on vertebrae viz. compression, tension, shear & torsion. • Commonest site of stenosis L4-5; 2nd commonest L3-4

"Freeze Phenomenon ": bouts of unprovoked paraspinal muscle spasm **"Freeze Phenomenon "**: bouts of unprovoked paraspinal muscle spasm exertion. **Calf cramps** at night are typical of canal Stenosis

"Facet syndrome": Also called Recess Facetal hypertrophy compression of root Dimension recess < 3 mm on CT scan

"Lateral stenosis" arthropathy/ leads to exiting nerve of lateral is diagnostic

Spondylolisthesis: Also called as pain of instability Low backache, radiating pain in both lower limbs with aggravation on turning in bed May be asymptomatic in Grade 1 listhesis Classical **"Scottie dog sign"** on plain radiograph

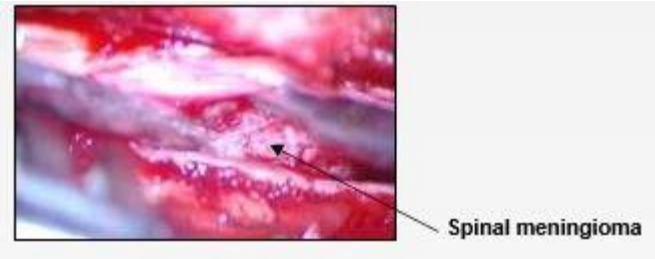


Neoplastic (Spinal Tumors)

Extradural & vertebral body tumors : Forms 55% of spinal tumors; well-localized pain, weakness in lower limbs and imbalance while walking, delayed bladder/bowel involvement. Primary tumors viz. myeloma, neurofibroma, giant cell tumor, and eosinophilic granuloma

Secondary tumors most commonly from prostate, breast or lung malignancies, and lymphomas

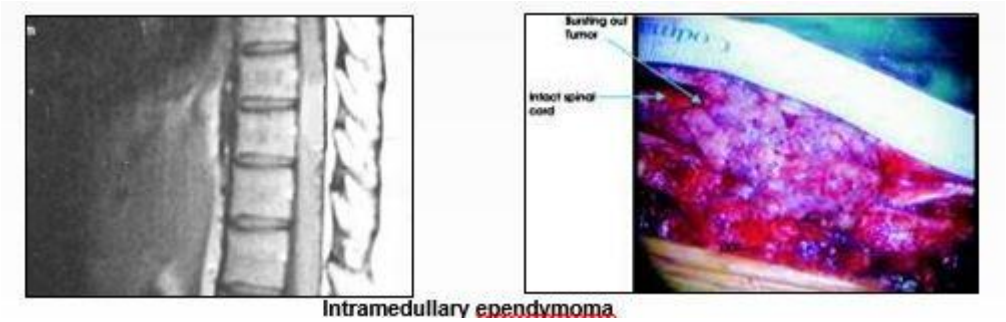
Intradural Extramedullary tumors : Constitutes 40% of spinal tumors Radiating backache, weakness in lower limbs, late involvement of bladder/ bowel Common tumors: meningioma, neurofibroma, lipoma



Intramedullary tumors : Constitutes 5% of spinal tumors Presents as ill localized backache, diffuse burning pain in lower limbs, worse at night **"Nocturnal pain"** (is not a pain of degeneration!) Bladder / bowel disturbances, weakness in lower limbs and **"dissociative anaesthesia"** Commonly astrocytoma (30%), or ependymoma (30%).

Others (30%) include dermoid, epidermoid

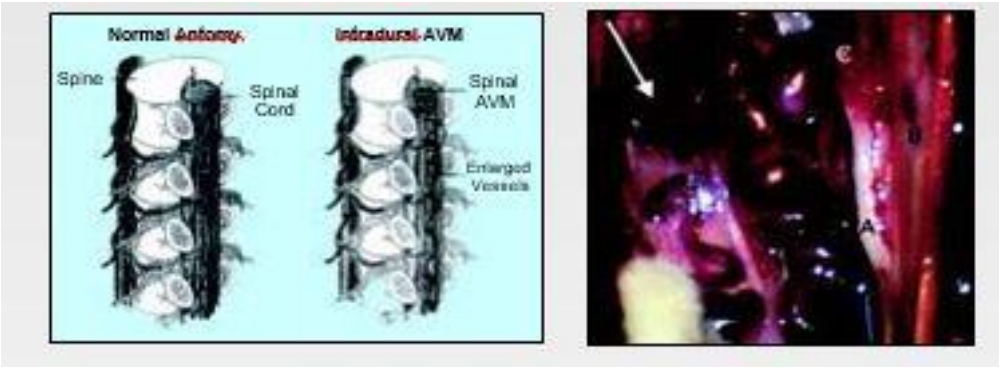
a. **Intramedullary tumors** : Constitutes 5% of spinal tumors Presents as ill localized backache, diffuse burning pain in lower limbs, worse at night **"Nocturnal pain"** (is not a pain of degeneration!) Bladder / bowel disturbances, weakness in lower limbs and **"dissociative anaesthesia"** Commonly astrocytoma (30%), or ependymoma (30%). Others (30%) include dermoid, epidermoid



Intramedullary ependymoma

VASCULAR :

a. Spinal Arteriovenous malformation (AVM)



Hemangioma Often asymptomatic but can cause well localized backache. Easily detected on MRI Usually treatment is not necessary but care should be taken if accidentally detected during instrumentation, as it can bleed profusely whilst fixing cancellous screws

Agency for Health Care Policy and Research of the U.S. Public Health Service

Potential Serious Problems: Intraspinal tumor, infection, fracture, cauda

- Sciatica: Pain along course of sciatic nerve due to root compromise
- Nonspecific Back Pain: Pain that suggests neither nerve root compromise nor

CLASSIFICATION OF LOW BACK PAIN

According to duration of symptoms

i. **Acute:** Less than 6 weeks duration
ii. **Sub acute:** 6 weeks to 3months duration
iii. **Chronic:** More than three months duration

RED FLAGS IN LBP

Cancer, Infection

- Age <20 or >50years
- History of Cancer
- Unexplained weightloss
- Immunosuppression

- UTI, IV drug abuse, fever

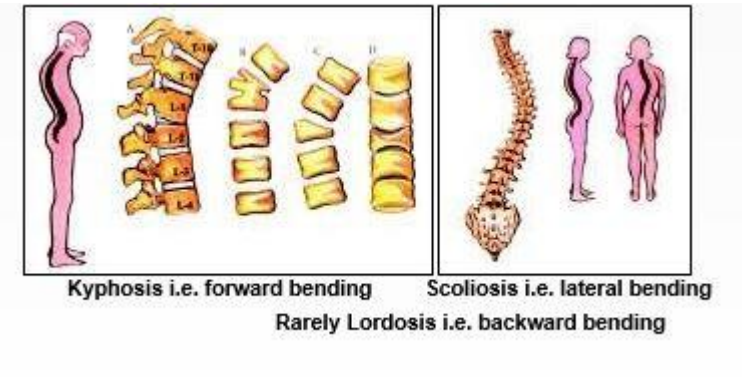
Spinal Fracture

- History of trauma
- Prolonged use of steroids
- Known underlying malignancy
- Age > 70 years ``old man with new backache``

Cauda equina syndrome & severe neurological compromise

Acute onset of urinary retention or overflow urinary incontinence, fecal incontinence, loss of anal sphincter tone, saddle anaesthesia, global / progressive weakness, foot drop

Deformities



QUESTIONS TO BE ASKED ???

Onset : How did LBP start?

Localisation : Where is the pain? midline / paraspinal

Duration : For how long?

Progress : Is it constant or intermittent? recurrent? progressively worsening ?

Radiation : Recognition of exact region of radiation helps to identify the affected nerve root

How is it aggravated?

What factors relieve it? how much is the relief? Is there any limb weakness?

Are there any paraesthsiae (tingling, numbness)? where?

Identification of weak/wasted muscles, loss of sensation/reflexes will help localise the impaired root & anatomical level

Have you received treatment? efficacy & durability of the treatment? Is there any neck pain?

WHAT SHOULD BE SEEN WHILE EXAMINATION BY A PHYSICIAN?

Examine the whole spine with minimum clothing.

When **standing** : Posture : scoliosis, lordosis, kyphosis. Obesity, bamboo spine Mobility : flexion, extension, lateral bending. Pain, restriction during movement Spinal tenderness, paraspinal muscle spasm

Chest expansion

Motor examination : muscle power, wasting, deep tendon reflexes, tight hamstrings, peripheral pulses, trophic changes Abdominal muscle tone

Straight leg raising (SLR) test : The Lasegue sign : Classical sign of root stretch most commonly due to slipped` disc. May not be restricted in lumbar canal stenosis inspite of significant pain because the root is squeezed and **not** stretched (unless associated with disc prolapse).

Level of disc prolapse	Involved nerve root	Classical clinical sign
L4-5	L5	Weakness of Dorsiflexion of foot/Great toe
L5-S1	S1	Ankle jerk hypoactive/absent

A large central / paracentral disc prolapse may occasionally involve more than one nerve root

Sensory examination : sensory dermatomes are depicted In prone position :

Spine : paraspinal muscle spasm, muscle tenderness in buttocks, hamstrings, calves indicate irritation of appropriate nerve root Step in the spine indicates `**listhesis**` Reverse SLR : for upper lumbar root stretch Ankle jerk

RELEVANT INVESTIGATIONS

X-RAY LUMBOSACRAL SPINE

Fundamental baseline study

- Reveal decrease/increase of lumbar lordosis

- Reduction in disc space
- Sacralization /lumbarization
- Spina bifida
- Osteophytes
- Canal stenosis/widening/scalloping
- Pedicular destruction/facetal hypertrophy
- Compression fractures


S1 DERMATOME

Disadvantages

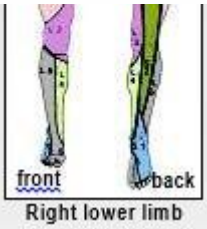
- Soft tissue evaluation not possible

MYELOGRAPHY

After Subarachnoid contrast injection


Advantages

- Images in Sagittal plane possible
- Better evaluation of Cauda equine
- Functional obstruction in canal stenosis
- Disc bulge
- Arachnoiditis
- Epidural fibrosis



Right lower limb

Disadvantages

- Needs admission or rest at home for 24 hours
- Extradural pathology may be missed


L5 DERMATOME

MRI

Has largely replaced CT/ myelogram When to do?

- When diagnosis is in doubt
- Failure of conservative treatment
- When patient is a sure candidate for surgery

Advantages

- Evaluates all constituents/contents of the spine
- Sagittal imaging possible in addition to axial & coronal views
- Evaluation of Cauda equina / extra dural lesions
- Better post operative evaluation

Disadvantages

- Prolonged study
- Claustrophobic patients (are noncompliant)
- Bony study not satisfactory
- Difficulty in scoliotic patients **CT SCAN**

PLAIN Advantages

- Disc prolapse
- Loss of epidural fat
- Loss of normal convexity of dural tube
- Excellent bony study
- Fast scanning
- Less expensive
- Better study of bony spinal canal

  Efficacy may be equal or even superior to MRI if added subarachnoid contrast material **(CT MYELOGRAPHY)**

RHEUMATOLOGY INVESTIGATIONS

Includes RA factor, X-ray of small joints, Anti-nuclear antibody (ANA), Anti double stranded DNA test

BONE MINERAL DENSITOMETRY (BMD)

Quantifies degree of osteopenia/osteoporosis

BONE SCAN

Evaluation of skeleton under Gamma camera after intravenous injection of radioactive substance

Advantages

- Locate occult lesions
- Differentiate degenerative and neoplastic lesions

Disadvantages

- Non specific test
- Contraindicated during pregnancy and lactation

TREATMENT MULTIDISCIPLINARY APPROACH IS HELPFUL FOR LBP !

1. **Lumbar disc herniation**

Conservative treatment

Bed rest : Upright posture increases spinal loading, making the disc vulnerable to compression & further rupture. Bed rest eliminates the load on the ruptured

disc & allows the annular tear to heal with fibrosis. Bed rest would benefit if the prolapse is not too large or not entrapping the root in a stenotic canal or lateral recess. Hence 5 - 7 days of strict bed rest should give substantial relief in pain. Lack of relief is then a matter of concern & prolonging rest is unlikely to grant further or proportionate advantage. MRI may be asked for to establish the diagnosis and severity of compression.

First-ever episode of disc prolapse often responds easily to bed rest. Subsequent & frequent events may not respond as well and if physiotherapy, change of posture & habits etc. have not benefitted it is better to get MRI & consider microsurgical decompression.

Medical treatment :

- **Analgesics:** Nonsteroidal anti-inflammatory drugs (NSAIDs) Act as analgesic and anti-inflammatory agents. Useful in acute / chronic LBPs.

  Gastritis and nephropathy limit its prolonged use.

- Gabapentin

  Weak anti-convulsant agent effective in acute radicular pain. Can cause dizziness, sedation

Muscle relaxants : Helps relieve muscle spasm

Enzymes

Serratiopeptidase / chymotrypsinogen : Clinically found effective in reducing inflammation when supplemented to NSAIDs

Steroids

Have anti-inflammatory action & improve neurological deficit. May produce gastritis, osteoporosis & may aggravates diabetes

Neurovitamins

Vitamin B12, Folic acid, Thiamine, Lipoic acid

Spinal manipulation

Includes high velocity thrust techniques and also low velocity mobilization technique

German Method Chinese Method

Transcutaneous electrical nerve stimulation (TENS)

By passing electrical current through the body using surface electrodes to provide

analgesia Temporary method for pain relief but not a definitive mode

Traction

Stretching of spine with a hope to induce vertebral separation. Administered in a clinic with a motorized traction bed. Mostly ineffective Can produce neurodeficit hence abandoned in modern lumbar spine practice

Epidural injection of steroids: limited role in backache

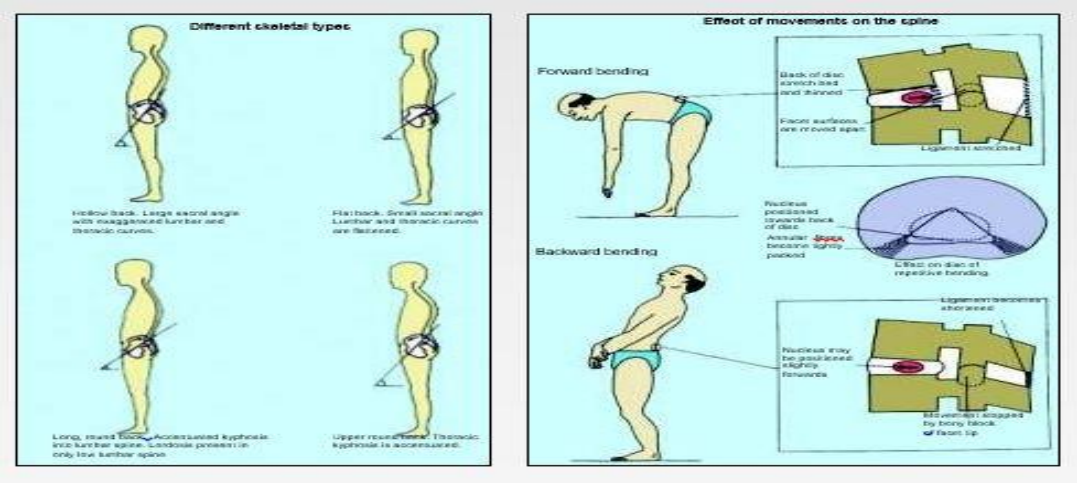
Physiotherapy : Should be customized for individual patient

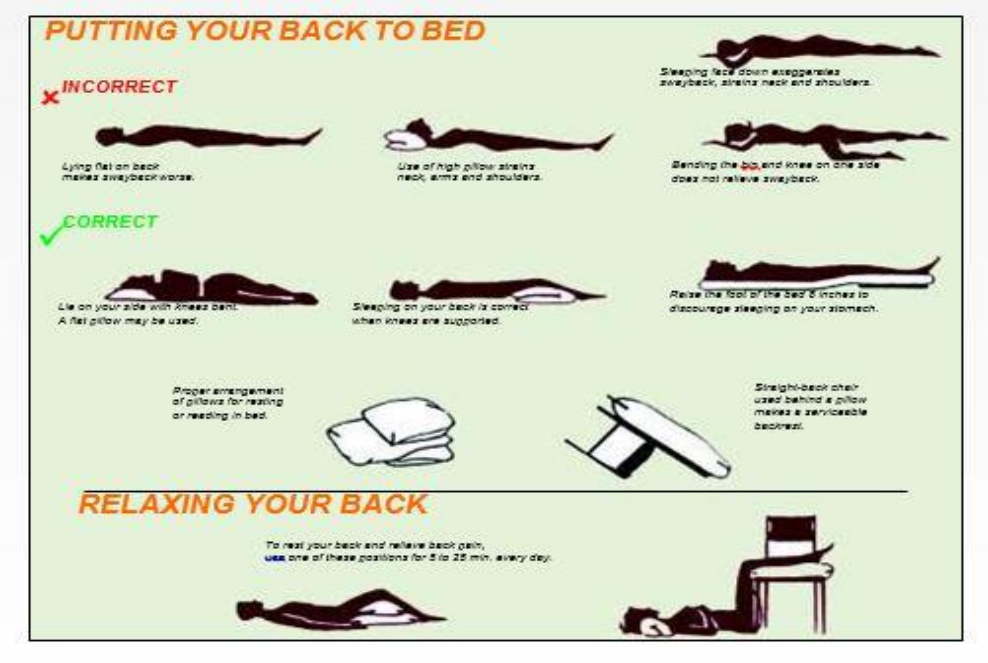
Basis is reduction of lumbar lordosis which is best achieved by flexion at knee

Aimed at improvement of tone of abdominal and paraspinal muscles

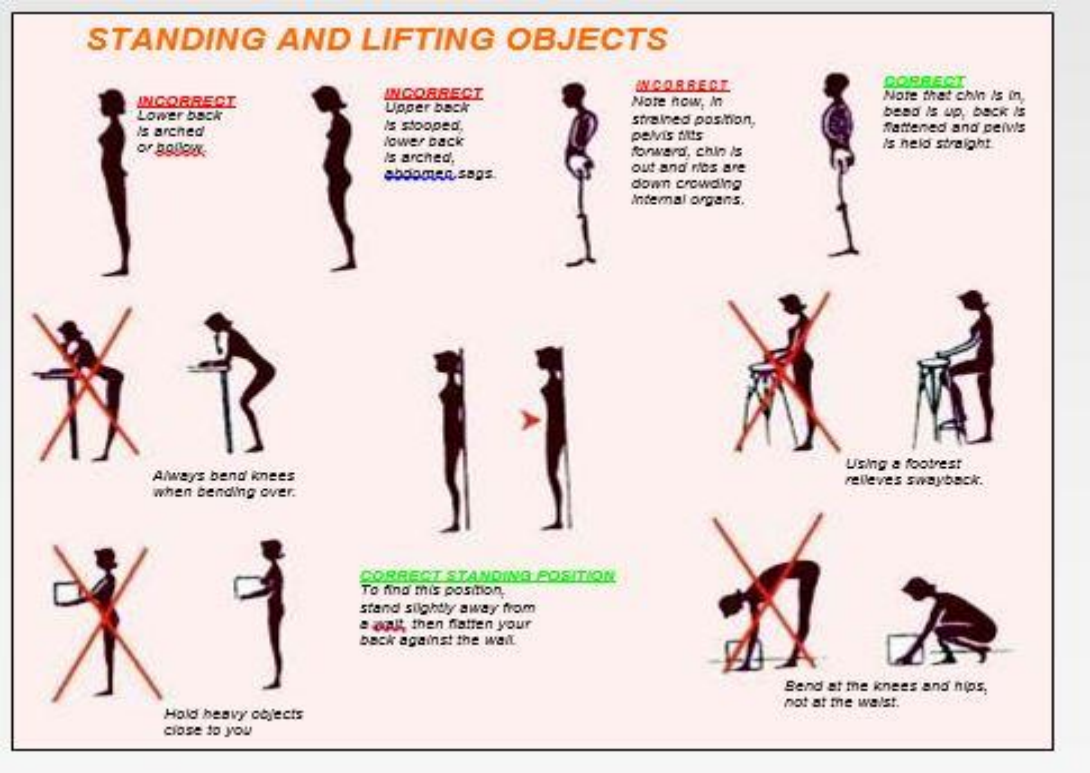
Provide rest to the spine by advocating correct posture

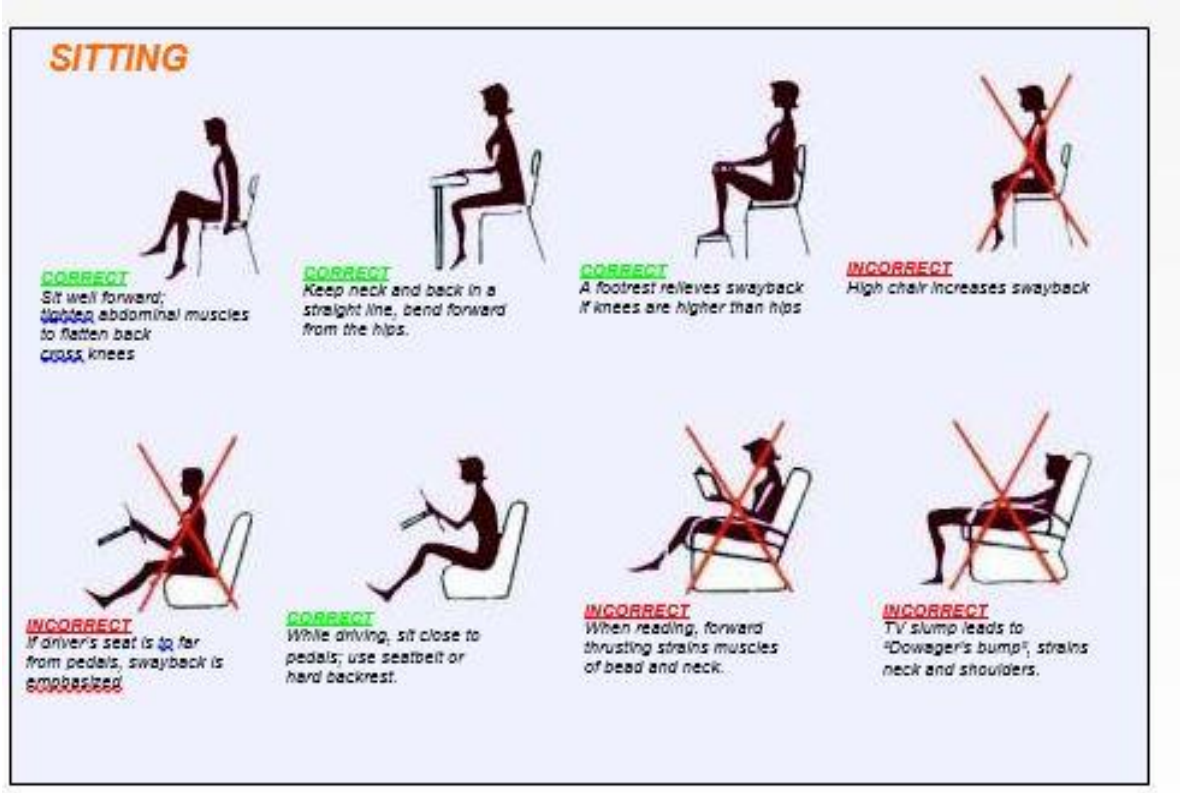
POSTURES & EXERCISES



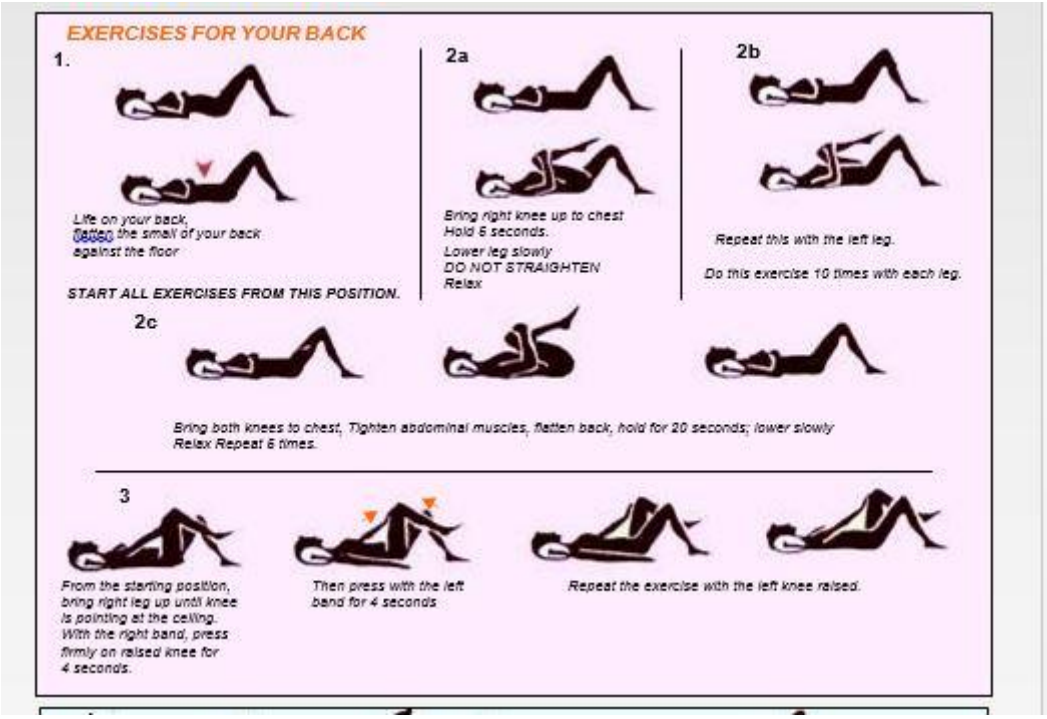


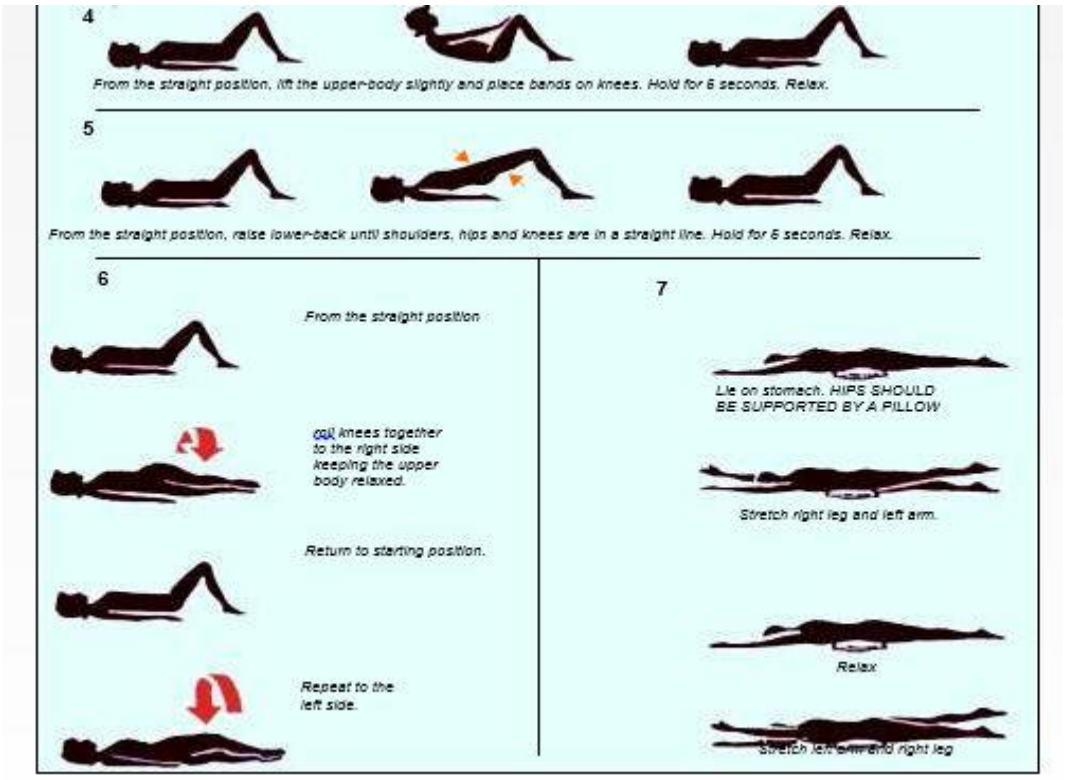
POSTURES & BACK EXERCISES

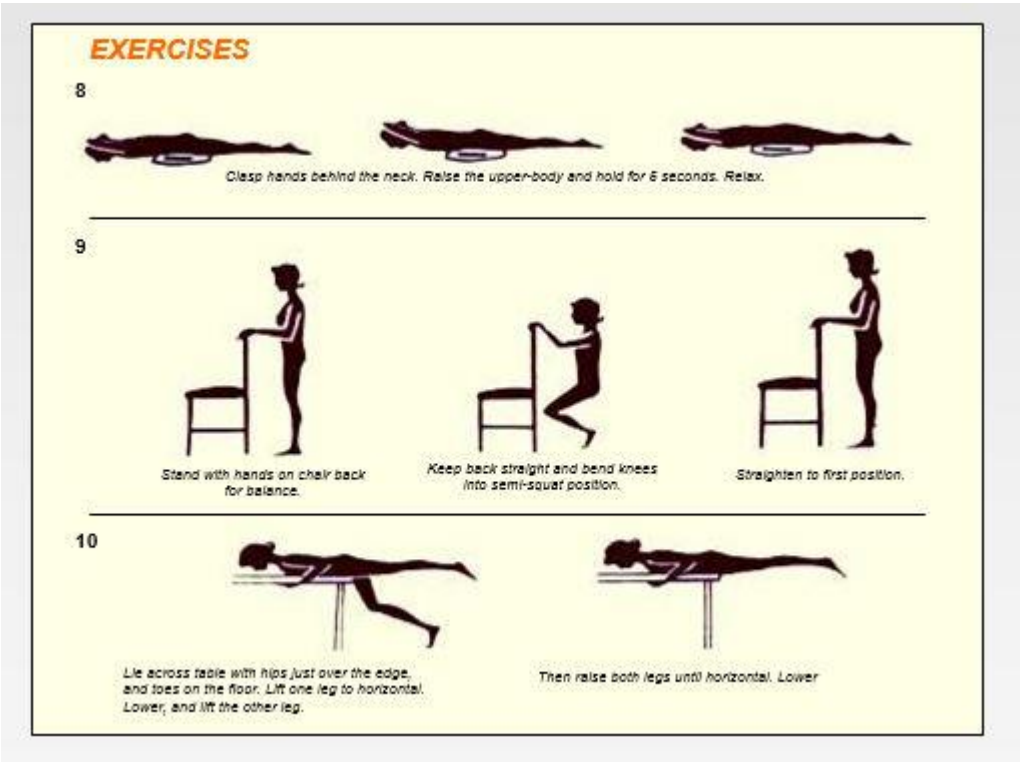


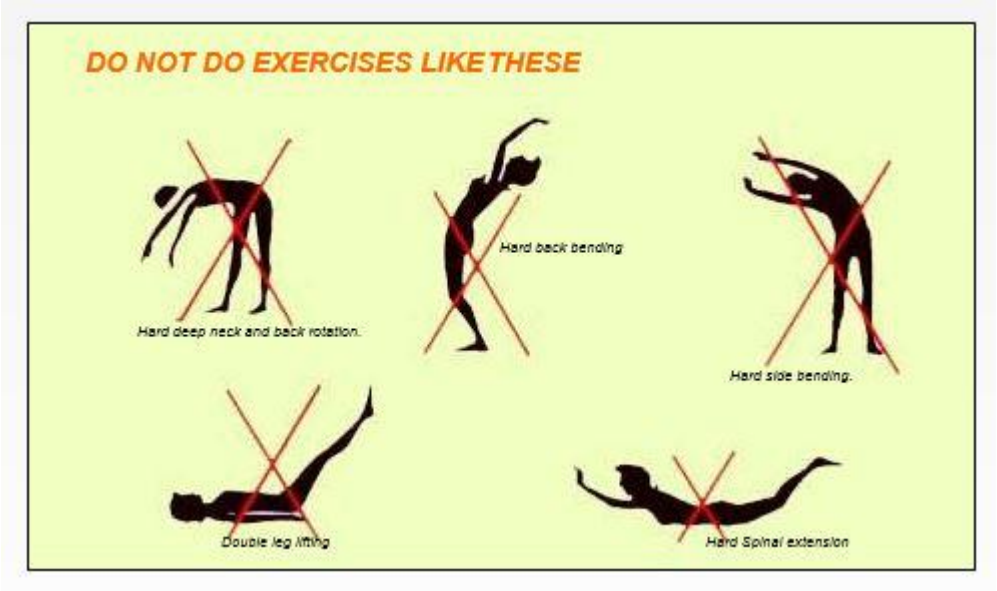


POSTURES & BACK EXERCISES



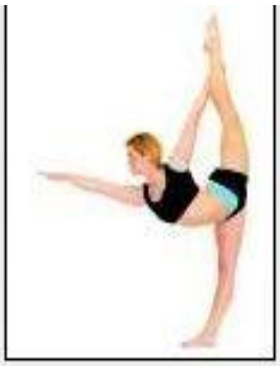






Essential Tips for exercises: Exercises 1 to 6 are done in supine posture with knees bent & roll to support the neck. They are aimed to strengthen the abdominal muscles. Exercises 7 to 10 are done prone or standing and help to strengthen back muscles. **Caution!** Do not do any exercise which cause / aggravate pain.

Yoga Therapy : It is not just an execution of poses but also an art of living! **BEWARE!** May not be suitable for all patients.



Back support: For short bursts during acute pain and whilst straining or at work Not advisable for long term use

Achieved by using an appropriate corset amongst the many available

When should conservative treatment be terminated?

1. Pain is not relieved significantly after one week of bed rest
2. Aggravating neurodeficits inspite of rest

Pain persistent even after dedicated physiotherapy

Surgical treatment

Indications

Absolute	1]	Cauda equina syndrome
	2]	Foot drop
	3]	Excruciating radicular pain
	4]	Neurogenic Claudication
Relative	1]	Severe backache / Sciatica
	2]	Young ambulant busy individual suffering constant or repeated bouts of pain

Laminectomy & Discectomy

Few indications in selected cases • **Beware! laminae are not disposable**

Has many disadvantages like spinal instability, kyphosis & epidural/perineural fibrosis

- **Microscopic Discectomy (without Laminectomy) Procedure of choice**

Promise of microdiscectomy

a) Instant, prompt, total and enduring relief from pain
b) Neurological recovery is possible
c) Quick return to normal life
d) Highly safe procedure

Recent Advances

- **Chemonucleosis**

Implies Intradiscal injection of Chymopapain Takes almost one month for liquefaction of nucleus pulpous Is less effective than standard microsurgery

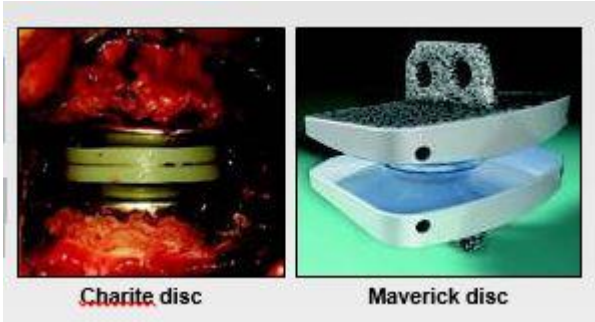
Intradiscal procedures : Automated percutaneous lumbar discectomy using nucleotome

Laser disc decompression for minor annular bulge
Percutaneous endoscopic lumbar discectomy Gaining acceptance in selected cases

Disc replacement procedures

Following discectomy joint mobility can be preserved using artificial disc.

A new procedure and an interesting concept but expensive & has to pass the test of time.



Lumbar canal stenosis

MIDSS (Microsurgical internal decompression of spinal canal stenosis)

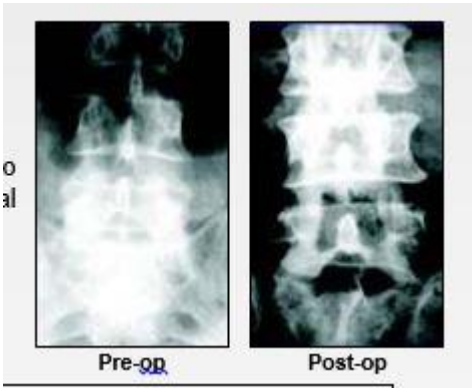
Minimal loss of bone, restricting drilling to components compressing the neural structures

Laminectomy : we rarely advocate

Lumbar spondylolisthesis

- **MIDSS** (Microsurgical internal decompression of spinal canal stenosis)
- **PLIF** (Posterior lumbar interbody fusion)

  Using bone graft/cage & pedicle screw and rod/plate fixation.



Extradural lesions

- Anterolateral decompression and fusion
- Laminectomy
- Laminotomy, tumor excision and Laminoplasty

Vertebral fractures

Anterolateral decompression and fusion

Vertebroplasty

C-arm guided intra-vertebral injection of liquid bone cement

Liquid cement solidifies to relieve pain instantly

Early mobilization

BEWARE!

Subsequent fracture at a level above or below is not uncommon

Intramedullary Spinal Cord Tumors : **Laminotomy, excision of tumor and Laminoplasty** very sophisticated & demanding

AVM (Arterio Venous Malformation) : **Embolisation**

Recent advancement in the treatment of AVMs Reduces flow across AVM to significant extent May be curative in small AVMs

Has limitation to its applications for Spinal AVMs

Surgical excision : Treatment of choice for this condition Confirms 100%

removal of the disease Runs the risk of neurological deficit

COMPLICATIONS OF SPINE SURGERY

- **Recurrent disc prolapse** Rarely occurs in

  expert hands Can be at same or another

  level

  Recurrence of backache and radiculopathy may need resurgery
- **Perineural Fibrosis**

  Decompressed root gets anchored, adhered, engulfed by fibrous tissue
- **Discitis**

  Rare but morbid complication, resulting from inadvertent intraoperative inoculation of bacteria

  ArachnoiditisOccurs due to post operative infection and persistent

  inflammation Results in adherence and atrophy of nerve roots

- **Failed back syndrome**

  A result of wrong diagnosis, surgery at wrong level or post operative infection

- **Spondylolisthesis**

  Following extensive bone removal such as laminectomy & facetectomy

  Neurological deficit of varying grades

CONCLUSIONS

LBP is a frequent condition faced by human beings

Common causes of LBP are mechanical in nature

Most of the LBPs respond to conservative treatment but are often recurrent

Adequate investigations are necessary for **'red flags'!**

'Red flags' need surgical intervention

Microsurgery gives promising results

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