



Rehabilitation of the Spine

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Aims and Objectives

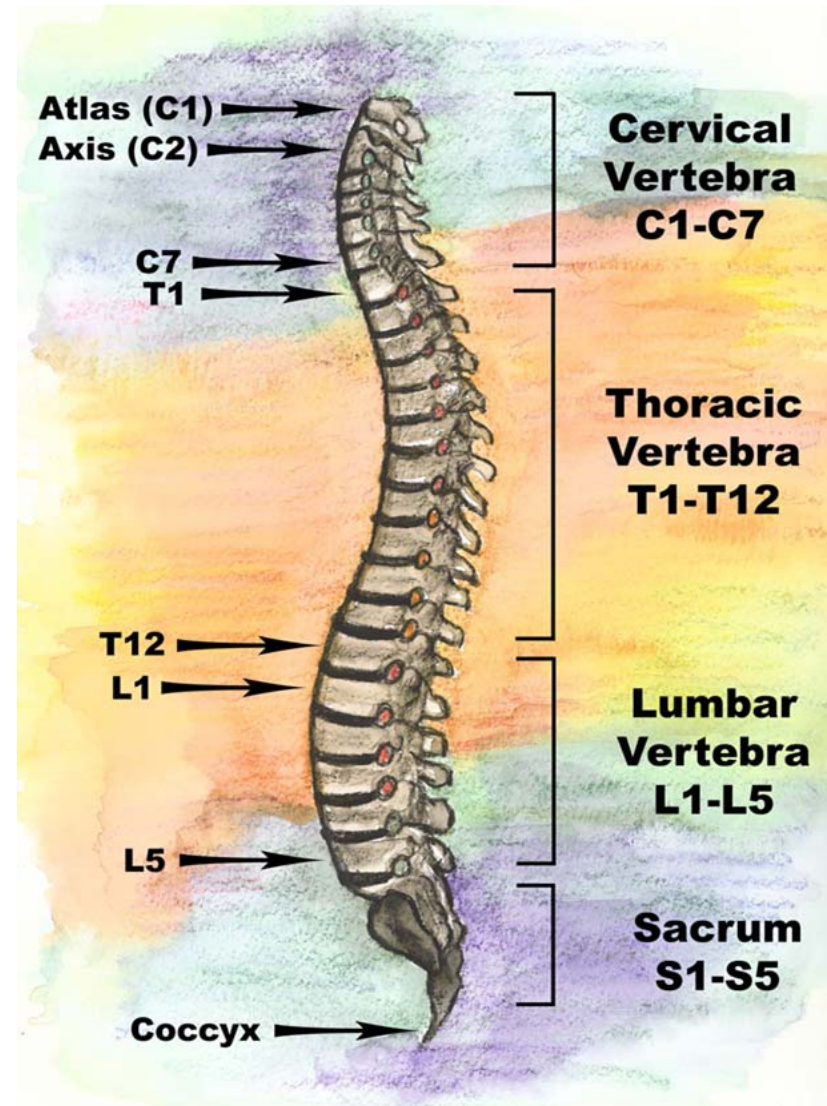
Anatomy, assessment and treatment of common spinal conditions

- **Postural Pain**
- **Low Back Pain**
- **Sciatica**



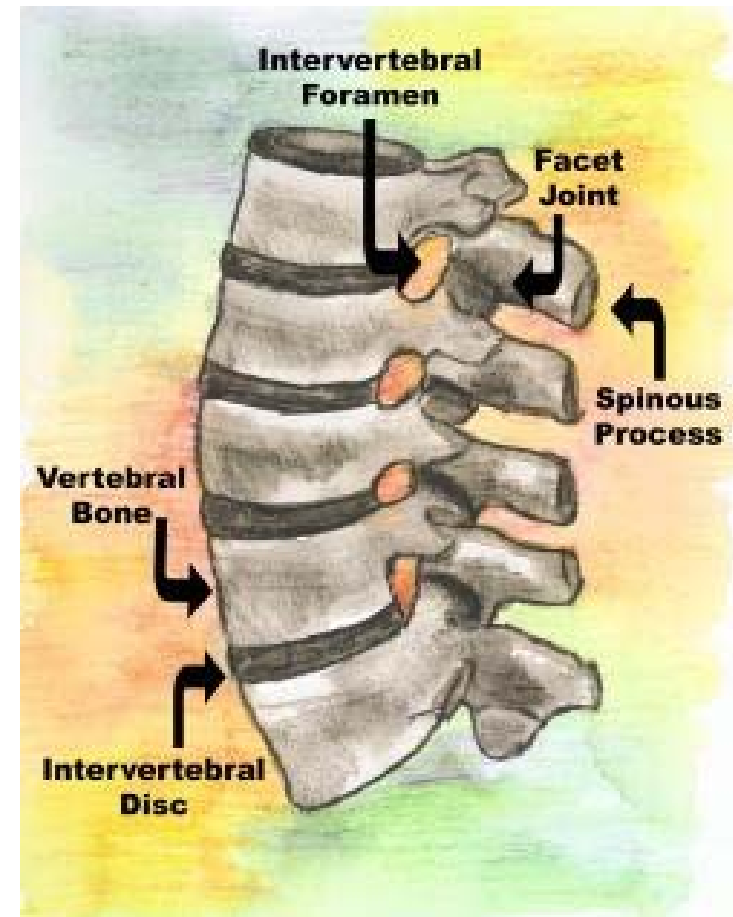
Anatomy of the Spine

- **Cervical** - supports the head.
- **Thoracic**- protects organs of the chest.
- **Lumbar** - weight bearing larger vertebra
- **Sacral** – part of pelvic girdle, protects pelvic organs



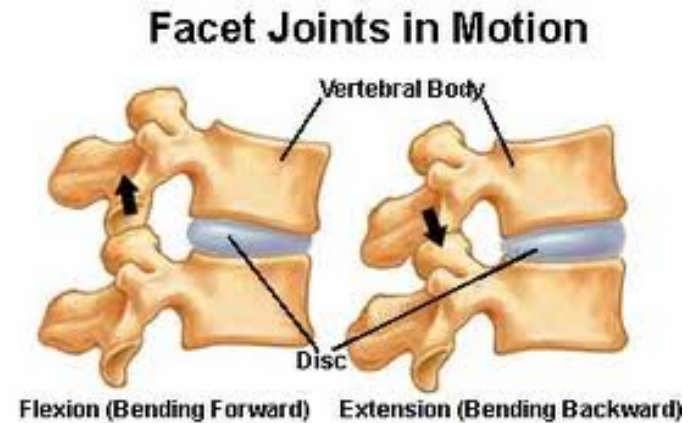
Vertebral Function

- Anterior designed to bear weight and withstand compression
- Posterior protects spinal cord
- Posterior muscle attachments
- Facet joint provides articulation



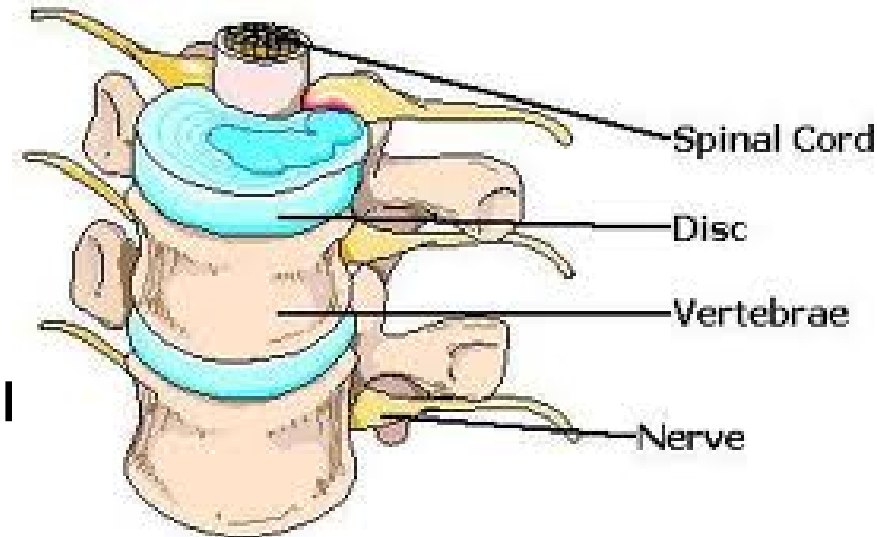
Joints and Ligaments

- Each vertebra has 4 facet joints
- Joints allow the motion of the spine
- Strong fibrous ligaments provide support, the stability and protection of the vertebra.

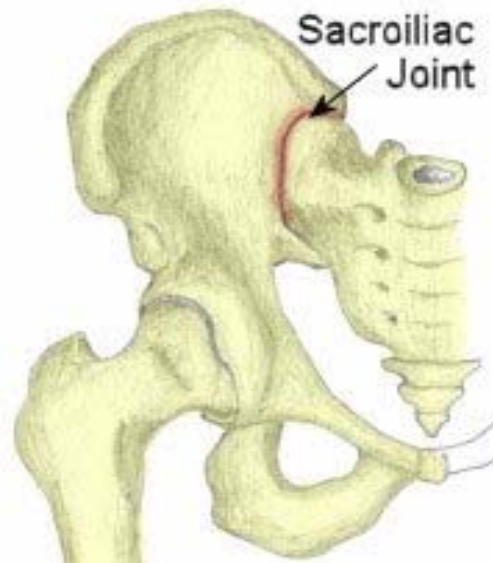


Discs

- **The moveable vertebrae are each cushioned by discs**
- **With age the discs become brittle and flatter – get shorter!**
- **Herniation of the disc can cause back and nerve pain - Sciatica**



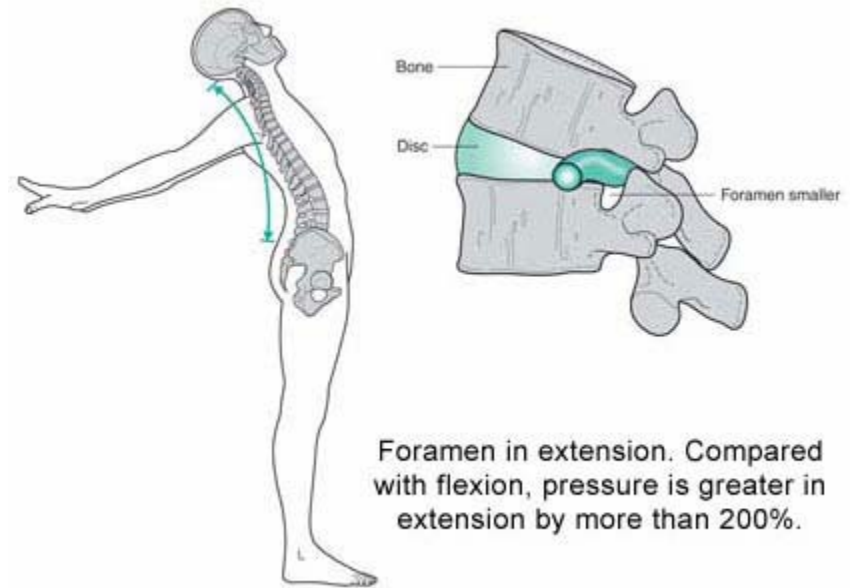
Sacroiliac Joint



- **Two joints between the sacrum and the pelvic bones**
- **Supported by strong ligaments**
- **Weight bearing**
- **Twisting forces act on the joints and ligaments when walking**

Muscles and Movements

- **Extension** - Backward movement of the spine
- **Muscles lie behind the vertebral column. Several layers make them strong**
- **Allow standing and lifting of objects**
- **Easily go into spasm**



Muscles and Movements

- **Flexion** - Forward movement of the spine
- **Cervical** – Chin to the chest
- **Bending forwards at the waist to pick up objects**
- **Abdominal Muscles and neck muscles**



Muscles and Movement

- **Side Flexion –**
Occurs when flexors and extensors on one side are contracted.

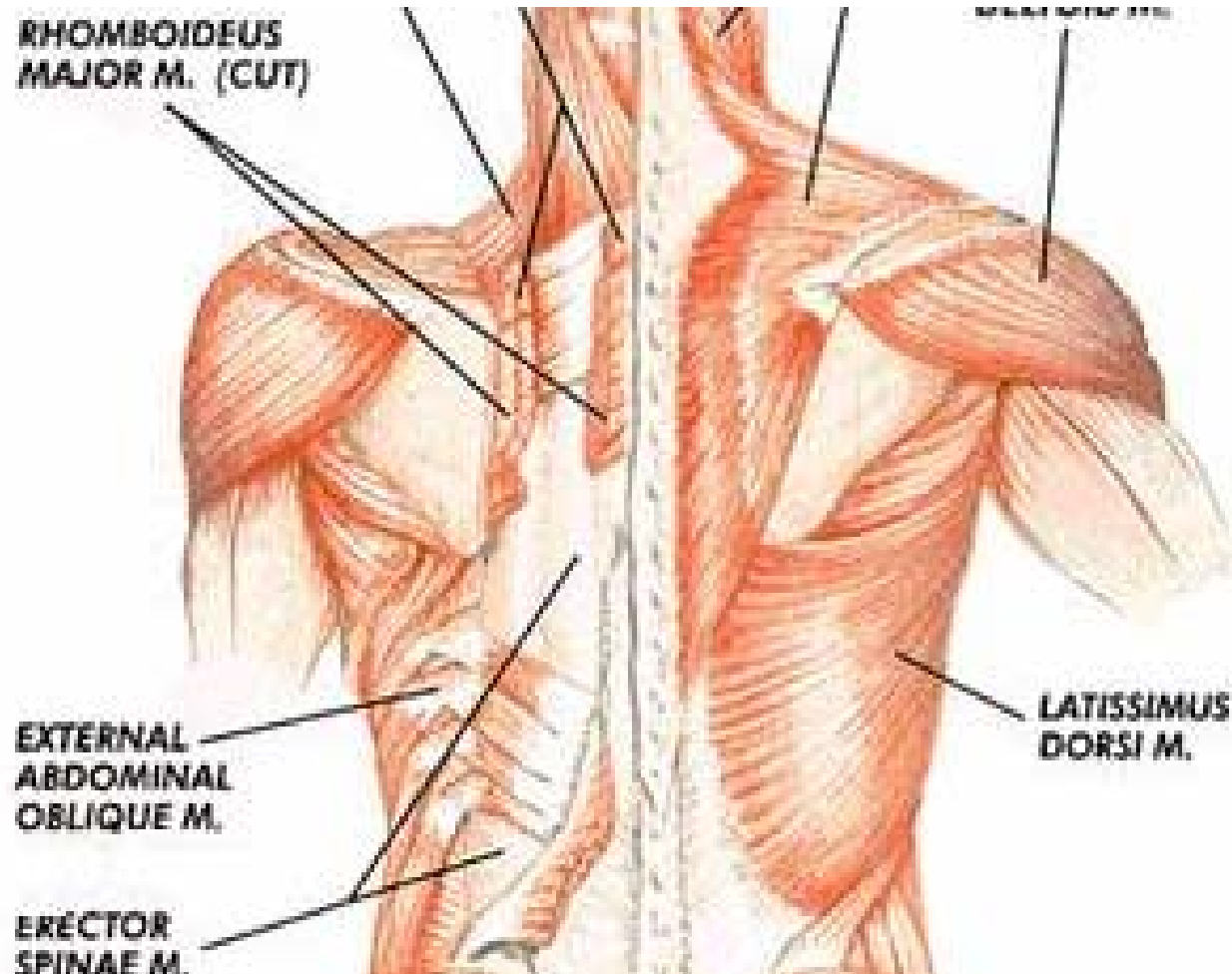


Muscles and Movement

- **Rotation** - occurs in the neck and thoracic spine
- **Abdominal muscles** mainly Internal and External Oblique



EXTENSOR BACK MUSCLES



ABDOMINAL MUSCLES



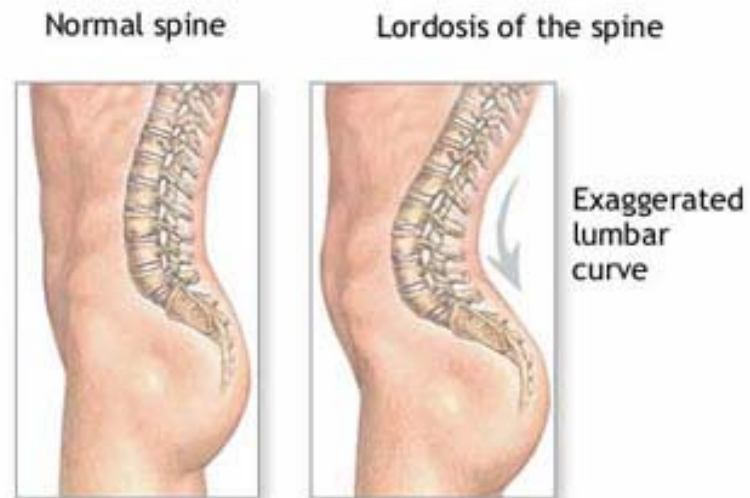
What can go wrong?



Poor Posture

Lordosis

- The pelvis is tilted forwards and the neck is often involved
- Muscle imbalance between the two groups of muscles acting on the pelvis
- Hamstrings and back extensors tight
- Common in pregnancy
- Teach exercises to strengthen abdominal and gluteal muscles and stretches to hamstrings and back extensors



Flat Back

- Pelvis is tilted posteriorly and strains the back ligaments, discs and muscles giving pain
- Loss of natural curve of the lumbar spine and lack of mobility of the lumbar spine
- Overuse of rectus abdominis muscle
- Hamstring muscles are tight
- Weak hip flexors
- Common in tall people and office workers



Sway Back

Head:
Forward

Neck:
Slightly extended

Scapulae:
Winged

Chest/Thorax:
Kyphotic (increased flexion)

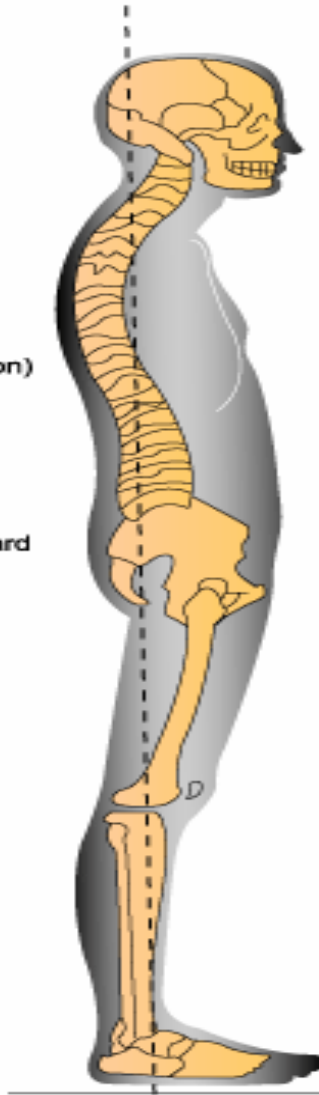
Lower Back:
Flattened.

Pelvis:
Posterior tilt/tilted backward

Hips:
Hyperextended with
forward positioning

Knees:
Hyperextended

Feet:
Neutral

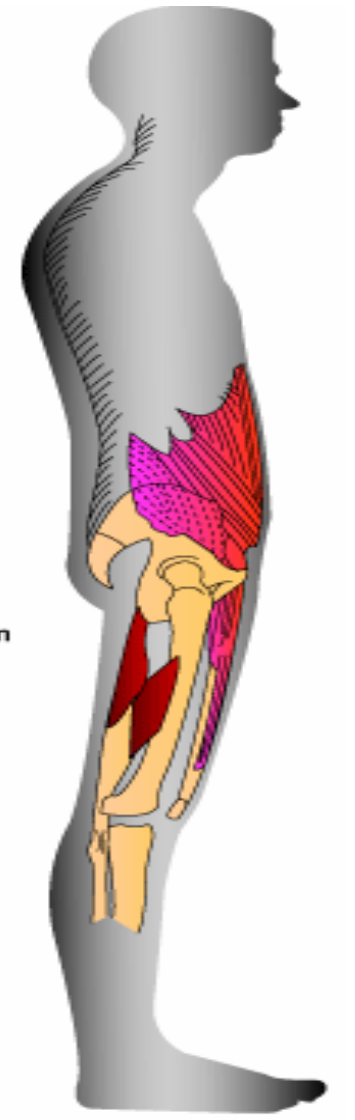


Lengthened and Weak:

- Hip flexors
- External obliques
- Upper back extensors
- Neck flexors

Shortened and Tight:

- Hamstrings
- Internal oblique
- Low back muscles
 - Erector spinae
 - Quadratus lumborum



Physiotherapy Assessment

- **Subjective** - establish the **Severity, Irritability and Nature of pain (SIN)**
- **Objective**- posture, range of movement, palpation, gait pattern
- **Evaluation**
- **Plan**



Treatment



- **Exercise** - teach patient and encourage them to continue independently
- Aim to regain the **balance** of the muscles by strengthening and stretching
- Consider every day **postural stresses** and educate - sitting, lying, standing, lifting and work
- Reduce muscle **pain** – heat packs/
massage

Exercises



Pelvic Tilt

Exercises



Knee Roll

Exercises



Lumbar Stretches

Exercises



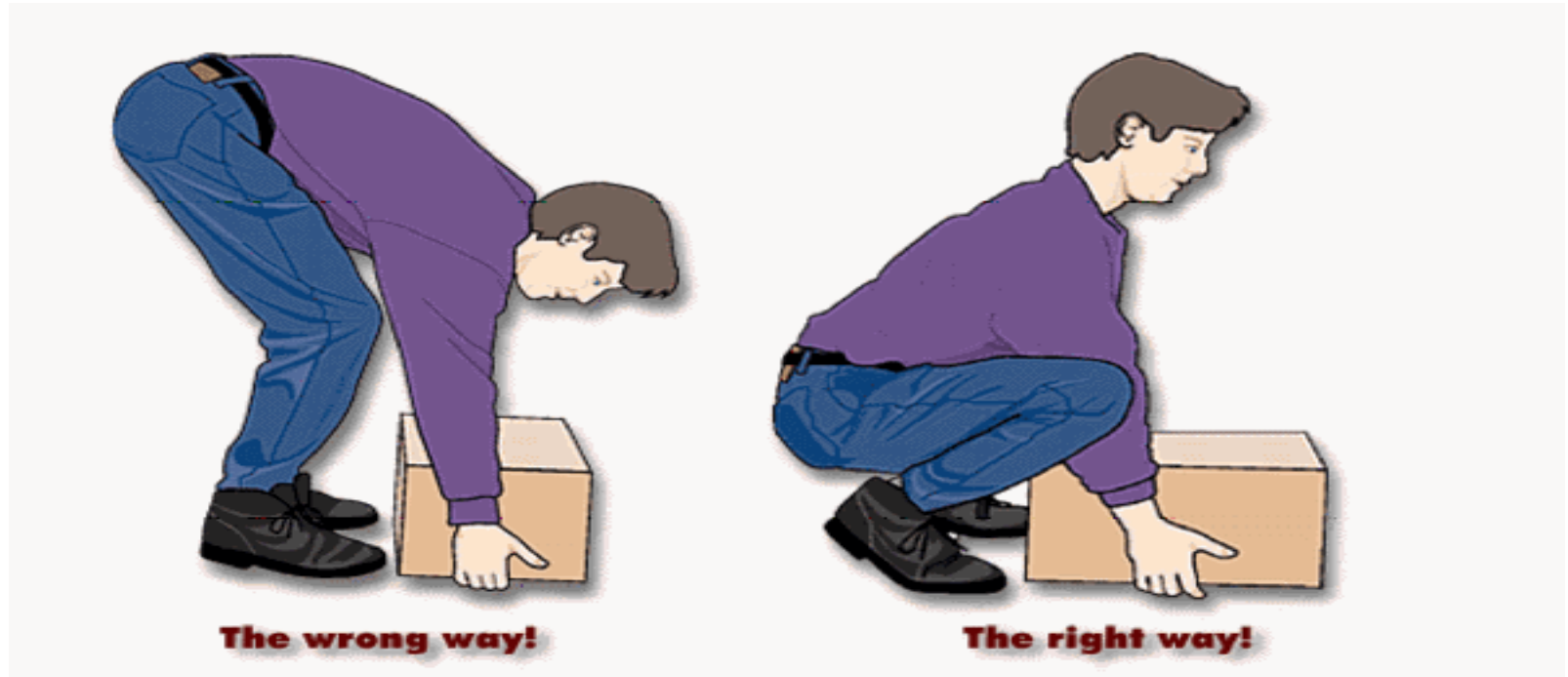
Extension Exercises

ALSO



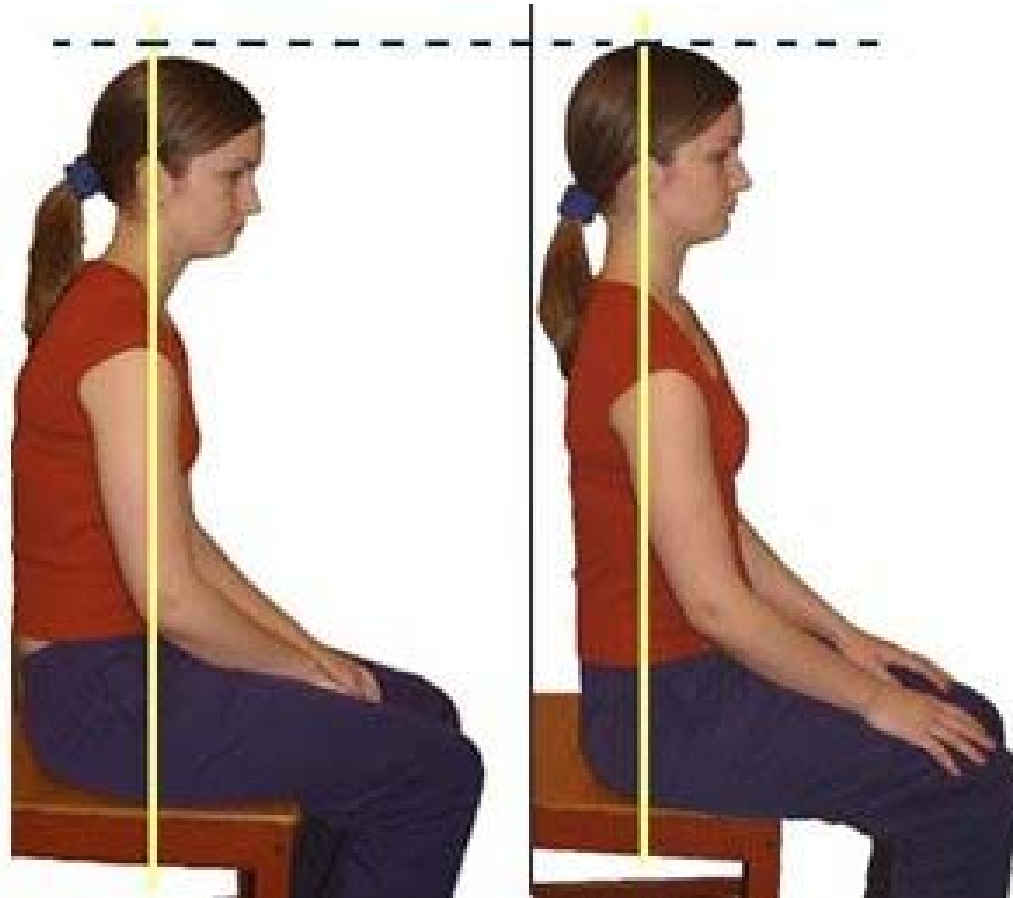
Massage and mobilisation

Moving and Handling



Lifting Techniques

Posture Correction



Heat



Low Back Pain

- **Onset age 20-55 years**
- **Located in lumbosacral region**
- **Pain Mechanical activity related and varies**
- **Patient well**
- **Several causes**

SI joint pain

Example of low back pain with SI joint involvement:



Physiotherapy

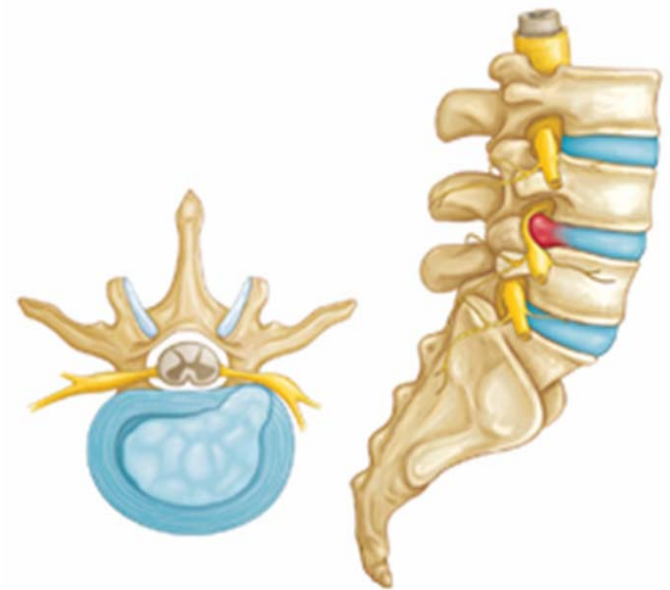
- **Assessment**
- **Advice** - moderate activities aggravating pain
- **Cold pack** to reduce ligament inflammation if acute
- **Mobilisation** of the joint if stiff on examination
- **Stabilizing/ strengthening** exercises of the back and pelvis if too mobile



SCIATICA

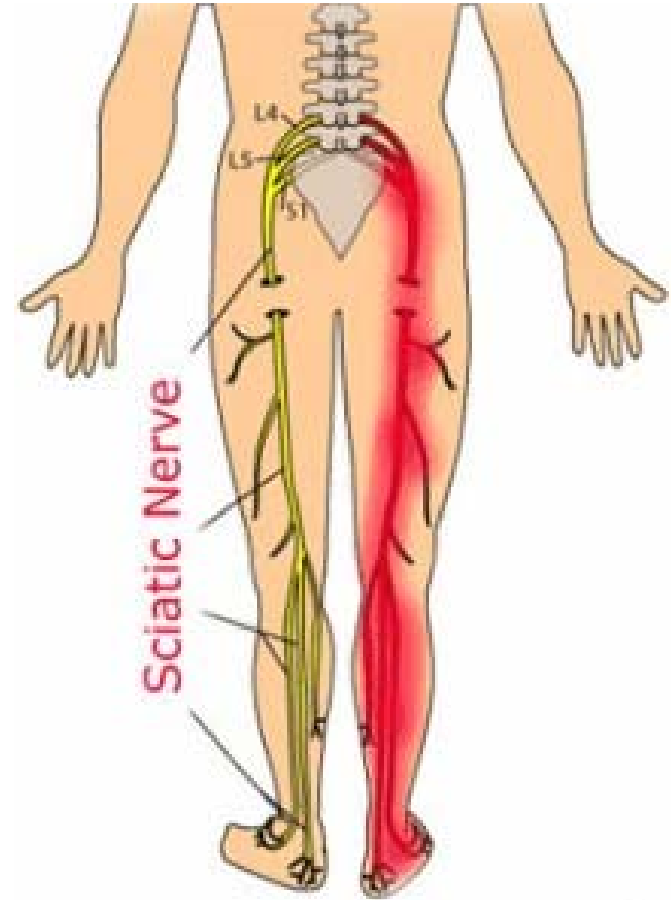
This is usually caused by:

- **The herniation of the disc onto the sciatic nerve**
- **Swelling and inflammation of the nerve compressed by the disc**
- **Referred symptoms along the sciatic nerve**
- **Other causes include spinal stenosis and muscle tightness**



Nerve Root Pain / Sciatica

- Pain radiates to foot or toes
- Numbness and paraesthesia in same area
- Reduced straight leg raise
- Loss of reflexes
- Pain worse in leg than the back



Physiotherapy

Assessment – Important to exclude widespread neurological disorder

Pain Relief – Medication

Ice pack to back

Stretches of lumbar spine

Stretches of the sciatic nerve

Heat to relieve muscle spasm

Massage

Advice Check sleeping position, sitting, standing

Moving and Handling

Summary

- *ASSESSMENT*
- *TREAT PAIN*
- *EXERCISE for FLEXIBILITY and STRENGTH*
- *POSTURE CORRECTION*
- *ADVICE, EDUCATION and PREVENTION*



ANY
QUESTIONS?