

# Approach to a Patient with Back Pain

Supervisor: Dr. Norah ALShehri



# MCQs



**Patient came to the clinic complaining of low back pain, in examination the big toe extension is weak, which nerve root you think is involved?**

- A. L3**
- B. L4**
- C. L5**
- D. S1**

**What is the leading cause of sciatica?**

- A. Piriformis syndrome**
- B. Spinal stenosis**
- C. Spinal disc herniation**
- D. Spondylolisthesis**

**Which one of the following is do you think is appropriate to referral ?**

- A. Fractures**
- B. Cauda equina**
- C. A+B**
- D. Undiagnosed back pain**
- E. All of the above**

**Which of the following is characteristic of a history of mechanical Lower Back Pain?**

- A. Relatively acute onset**
- B. History of overuse or a precipitating injury**
- C. Pain worse during the day**
- D. All**

**Which of the following is an excellent way of preventing and reducing back pain?**

- A. Exercise**
- B. Wearing proper shoes**
- C. Losing weight**
- D. Maintain a good posture**

# Common Causes

Monira AlHasan





# Main types of back pain

1. Mechanical
2. Systemic
3. Referred

# Mechanical Causes

1. Fracture
2. Lumbar Strain/sprain
3. Herniated disc
4. Spinal stenosis
5. Spondylolysis
6. Spondylosis
7. Spondylolisthesis
8. Discs and/or facets degeneration

# Systemic Causes

- Malignancy
  - Primary tumors
  - Secondary tumors: Metastatic
- Infection
  - Osteomyelitis
  - TB (Pott's Spine)
  - Brucellosis
- Inflammation
  - Spondylitis

# Referred Back Pain

- Ruptured Abdominal Aortic Aneurysm
  
- Pelvic Diseases
  - Prostatitis
  - Endometriosis
  
- Renal Diseases
  - Stones
  - Pyelonephritis
  
- GI Diseases
  - Pancreatitis

# Diagnosis: History, Red Flags, and Examination

# Start Your Approach by History Taking

- 1-Personal History
- 2-Chief complaints
- 3-History of presenting illness (SOCRATES)
- 4-Constitutional symptoms & red flags
- 5-PMHx
- 6-PSHx, trauma history and blood transfusion
- 7-Medications history and allergy
- 8-Family history
- 9-Social history
- 10-Systemic review

# History of presenting illness (SOCRATES)

Site

Onset: any offending events?

Course: any periods of remission?

Character

Radiation

Exacerbating factors: certain posture, coughing, straining

Alleviating factors: certain posture, medication, resting

Timing

Severity: How does it affect him/her emotionally and functionally

Associated symptoms: stiffness, deformity, numbness, paresthesia or weakness in the lower limbs

# Constitutional Symptoms & Red Flags

- Fever
- Weight loss
- nausea & vomiting
- Loss of appetite
- Night sweat
- Urinary retention or incontinence
- Fecal incontinence or urgency
- Impotence

- T** TRAUMA
- U** UNEXPLAINED WEIGHT LOSS
- N** NEUROLOGIC SYMPTOMS
- A** AGE >50
- F** FEVER
- I** INTRAVENOUS DRUG USE
- S** STEROID USE
- H** HISTORY OF CANCER



# Past History

- Past medical history
- Past surgical History
- Past trauma
- History of blood transfusion

# Medications History including Allergy

# Family History

- Of similar condition
- Any inherited diseases that run in the family
- History of Cancer

# Social History

- Residency
- Smoking
- Alcohol
- Illicit drug usage
- Recent Travel
- Contact with infected people
- Pet
- Immunization history

Don't forget ICE

IDEAS

CONCERNS

EXPECTATIONS

# Physical Examination (Standing & Supine)

Standing

# Look

- ★ Expose the trunk and lower limbs properly.
- ★ Examine front and back.
- ★ Notice any deformity (look from front, sides and behind), swelling, or skin changes (scars, hairy tuft, “café au lait” spots).
- ★ Notice normal thoracic kyphosis and lumbar lordosis
- ★ Notice shoulders & pelvis level.
- ★ Notice if the patient is consistently standing with one knee bent (suggestive of nerve root tension)
- ★ Gait:
  1. Abnormal types: Antalgic, Trendelenburg, waddling.
  2. Heel and toe walking: unable to heel walk= L4 weakness, unable to toe walk= S1 weakness

# Feel

- ★ Palpate spinous processes for tenderness, steps or gaps.
- ★ Soft tissues: temperature, tenderness.

# Move

- ★ Start with active ROM in all 6-directions
  1. Flexion. Record as such: able to touch toes/shins/knee/thighs (ask the patient to try to touch his/her toes)
  2. Extension: normal around 30° (without bending the knees)
  3. Lateral bending: normal around 30°
  4. Rotation: normal around 40° (the hip is anchored by examiner's hands)
- ★ Note if painful/painless.
- ★ Attempt passive ROM if active ROM is limited and painless, record



# Special Test

- ★ Adams Forward bending test: full forward flexion until back is horizontal to the floor. If thoracic scoliosis is present, then rib hump will become visible

Supine

# Look

- ★ Expose the trunk and lower limbs properly.
- ★ Examine front and back.
- ★ Note any muscle wasting in the lower limbs.

# Feel

- ★ Check for Leg length discrepancy (ASIS to medial malleolus).

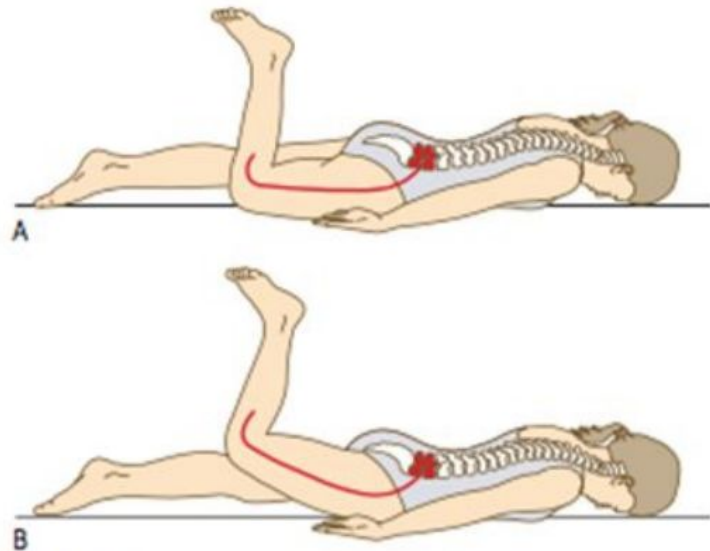
# Special Test

- ★ Straight leg raising test (SLRT): with the patient lying supine, passively elevate the leg –the examiner’s hand behind the heel- with knee extended while observing the patient’s face for sign of discomfort.
- ★ A positive test is reproduction of sciatica, a sharp shooting pain that radiates below the knee- between 30° and 70° of hip flexion. The pain is aggravated with dorsiflexion of the ankle and relieved with knee flexion.
- ★ Hamstring tightness and knee or hip pain should be distinguished from a true positive SLR. Screening Hip and knee examinations (e.g. rotation of the hips, joint line tenderness at the knees) should be done to rule out hip or knee OA which can be confused with sciatica.

Prone

# Femoral Stretch Test

- ★ Knee flexion with hip extension while the patient is lying in prone position.
- ★ Positive if pain felt in ipsilateral anterior thigh.
- ★ Positive test mean that the L3 and L4 nerve roots are involved.



**Fig. 14.26** Stretch test: femoral nerve. (A) Pain may be triggered by knee flexion alone. (B) Pain may be triggered by knee flexion in combination with hip extension.

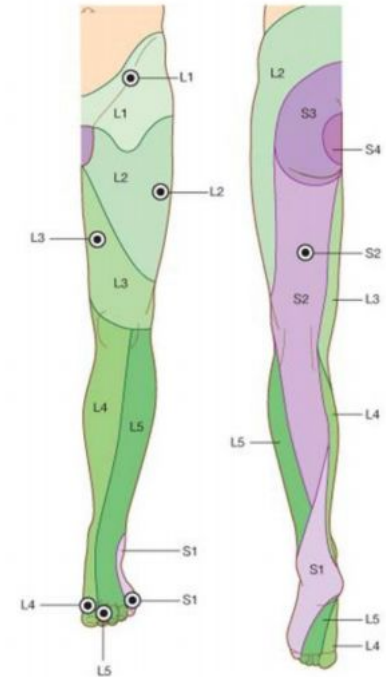
# Neurovascular Assessment of the Lower Limbs



# Neurological Examination

- ★ Motor: Hip flexion=L2, knee extension=L3, ankle dorsiflexion=L4, big toe extension=L5, Ankle plantar flexion=S1.
- ★ Sensory: dermatomes.
- ★ Tone: normal, flaccid or rigid.
- ★ Reflexes: knee & ankle jerks

Dermatomes of the lower limb



# Vascular Exam

Inspection: cold, hairless, shiny skin, ulcers

Pedal pulses (dorsalis pedis & posterior tibial artery).

Capillary refill (normal < 2 seconds).

# Brief Comment on Mechanical, Inflammatory, Nerve Root Compression, and Malignancy

Heba Al-Qattan



# Mechanical Back Pain

- Back pain is 97% mechanical.
- It can originate from any part of the back.
- **Deep, dull pain.**
- It is caused by mechanical problems in the bones, joints, muscles, and tissues of the spine.
- It is the second most common symptom-related reason for seeing a physician in the US (Hill, 2012).

**Vertebrae** are bones that protect your spinal cord. They can be forced or locked out of their proper positions (**mis-aligned**).

**Ligaments and muscles** are supportive tissues that can be stretched, torn, or weakened.

**Discs** are shock absorbers that can bulge, rupture, or wear down.

**Nerves**, which carry the body's messages, can get stretched, pinched, or irritated.



# Mechanical Back Pain

Acute (<6 weeks)

Sudden injury  
(muscle/ligament tear)

Compression fractures  
(osteoporosis)

Herniated Disc

Spondylolisthesis

Subacute (6-12 weeks)

Spondylosis

Lordosis  
(pregnancy)

Past injuries

Past surgeries

Chronic (>12 weeks)

Osteoarthritis

Occupational (long-term  
wear and tear)

Past injuries

Past surgeries

Spinal Stenosis

Scoliosis

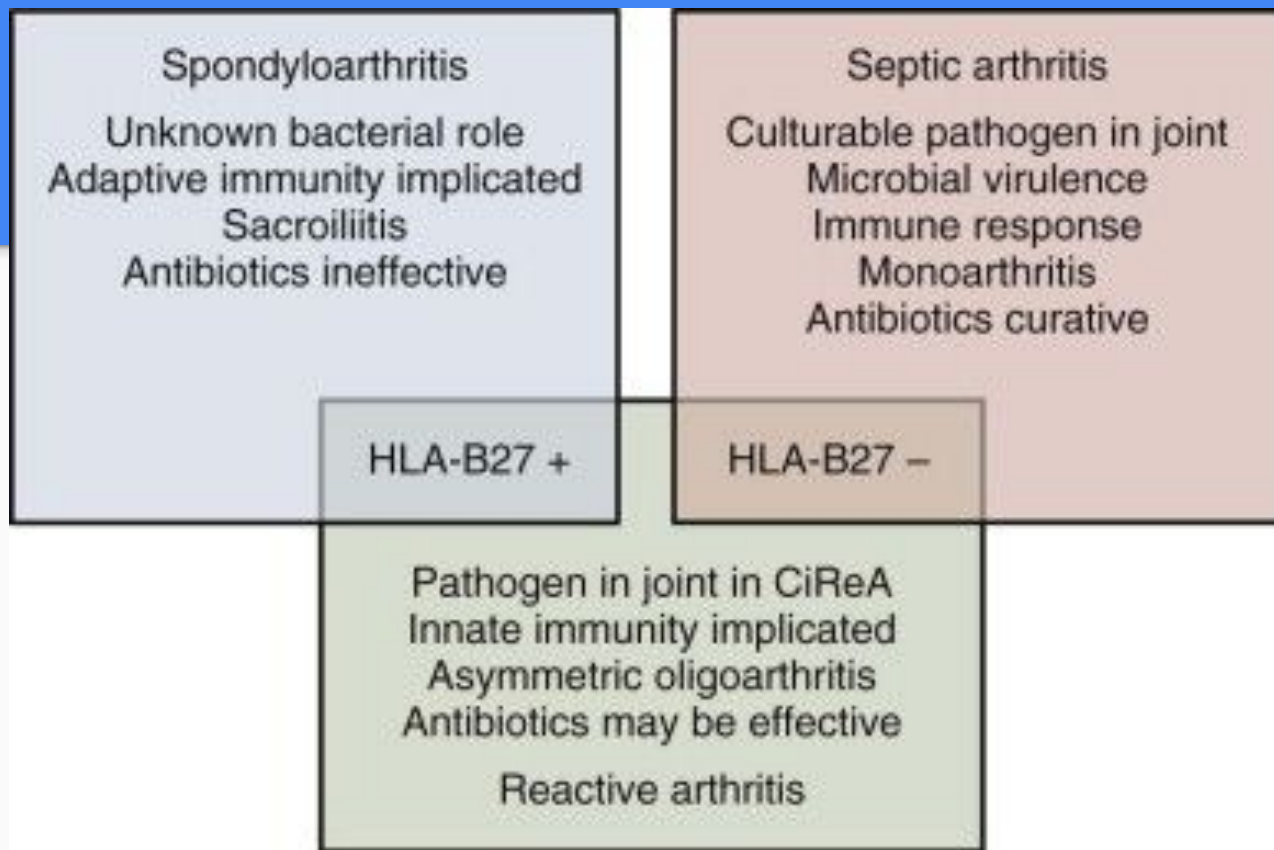
Kyphosis

# Inflammatory Back Pain



- From its name, inflammatory back pain is back pain caused by an inflammatory process that occurs in the body and targets the back.
- This has a very different presentation from mechanical back pain and should be distinguished in the history.
- It is typically less common than mechanical back pain.
- Common causes include Rheumatoid Arthritis, Ankylosing Spondylitis, and Reactive Arthritis (Reiter's syndrome).

Inflammatory Back Pain	Mechanical Back Pain
20-40 years	Any age
Males > Females	M = F
Subacute/Insidious onset	Often acute
Morning stiffness present (>30 mins)	No morning stiffness (or <30 mins)
Pain relieved by activity	Pain worsened by activity
Pain worsened by rest	Pain improves with rest
No neurodeficit	Neurodeficit may be present
Gluteal and hip pain often present	Absent
Seen in any profession	Commonly seen in sedentary sitting jobs
Wakes from night pain (improves upon getting up)	Absent
Inflammatory markers elevated	Inflammatory markers commonly normal

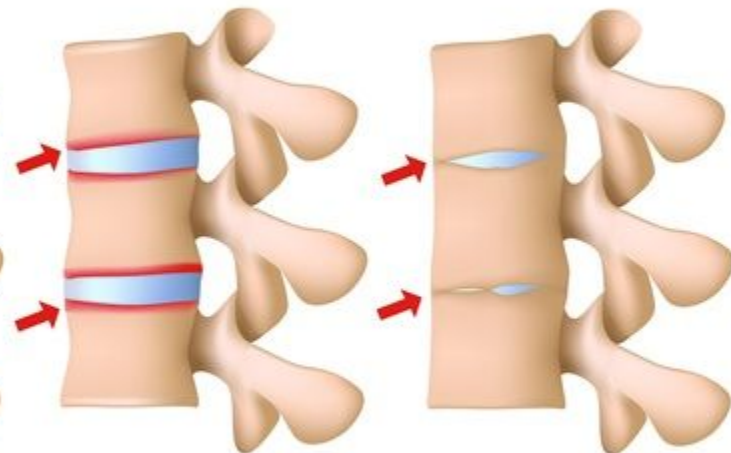




## Healthy spine

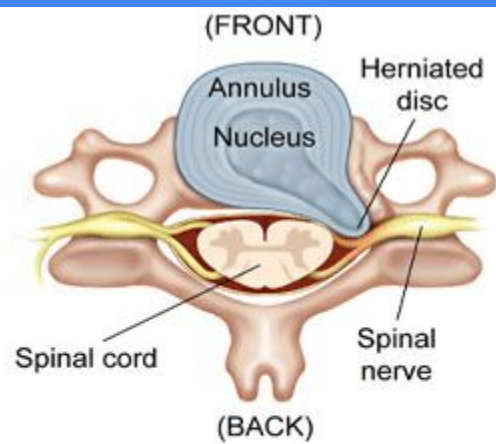
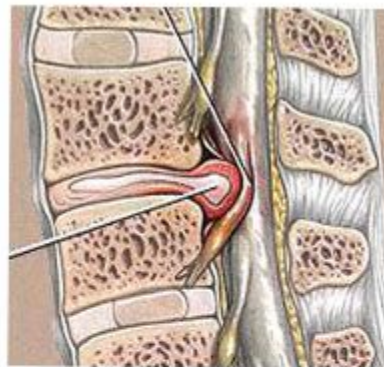
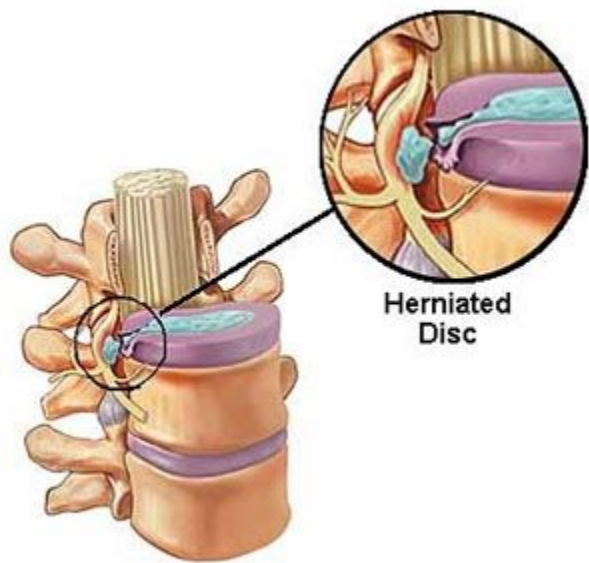


## Ankylosing spondylitis



# Nerve Root Compression

- It is a condition in which the nerve roots get pinched.
- **Sharp, stabbing pain.**
- The most common sites are the cervical and lumbar spines.
- The most common cause is disc herniation.
- Other causes include Rheumatoid arthritis, Osteoarthritis, Spondylosis, Spondylolisthesis, and, more rarely, meningitis, epidural abscesses, tumors, and meningiomas.
- Symptoms include pain and paresthesia in the muscles innervated by the nerve roots involved, so taking a detailed history on the site of pain is crucial.



**Nerve root**

**L4**

**L5**

**S1**

**Pain**



**Numbness**



**Motor weakness**

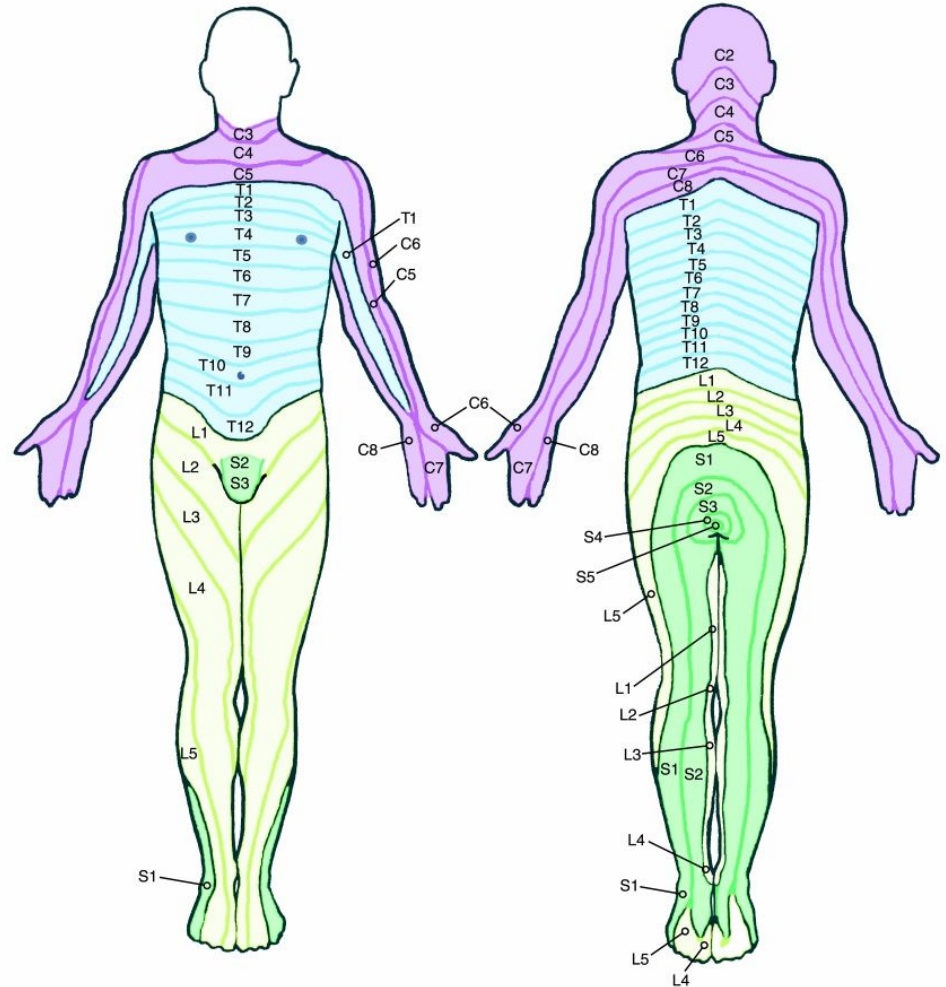
Extension of quadriceps	Dorsiflexion of great toe and foot	Plantar flexion of great toe and foot
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**Screening examination**

Squat and rise	Heel walking	Walking on toes
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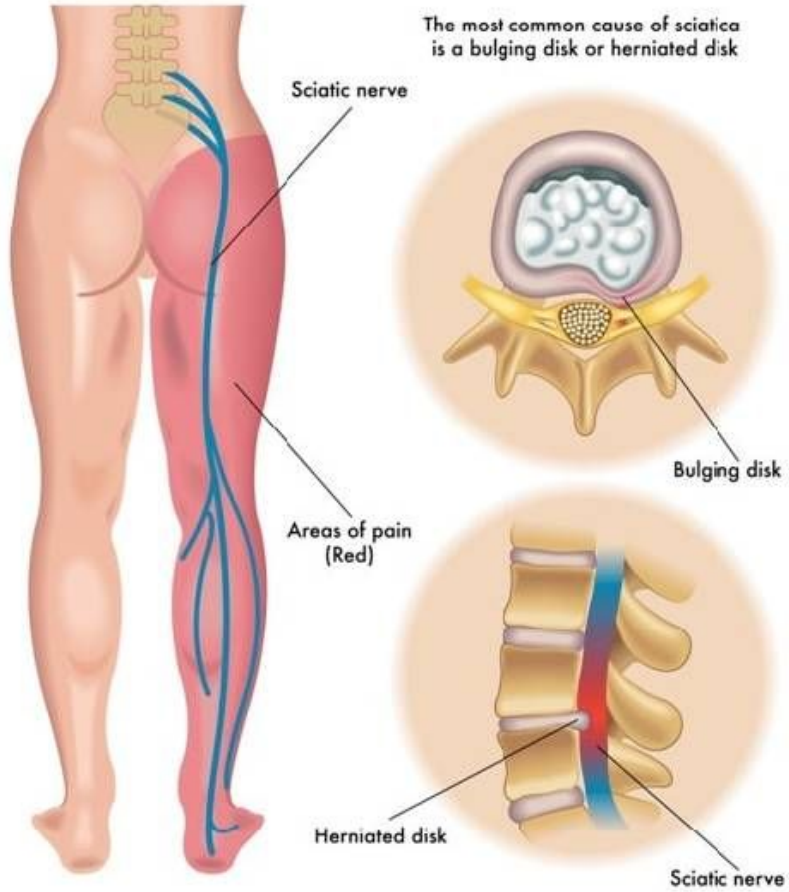
**Reflexes**

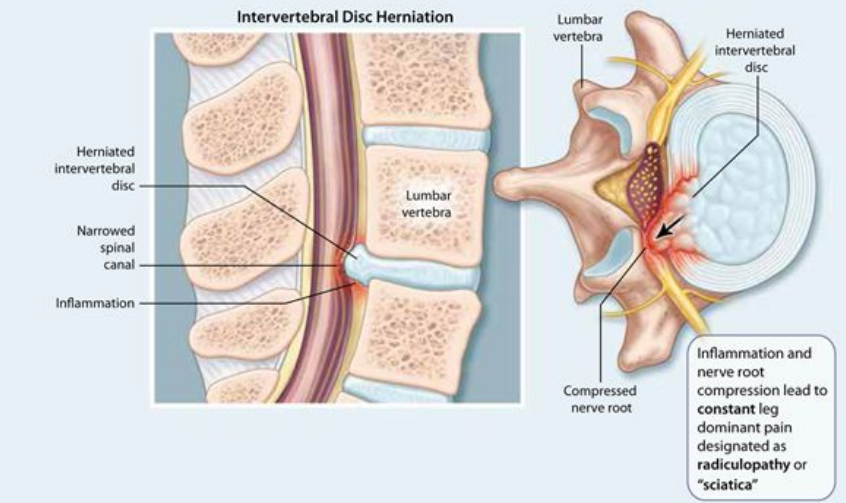
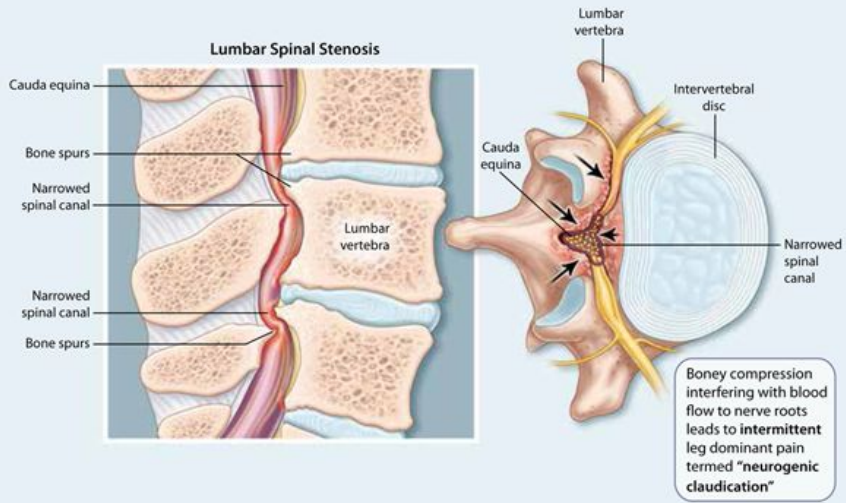
Knee jerk diminished	None reliable	Ankle jerk diminished
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# SCIATICA

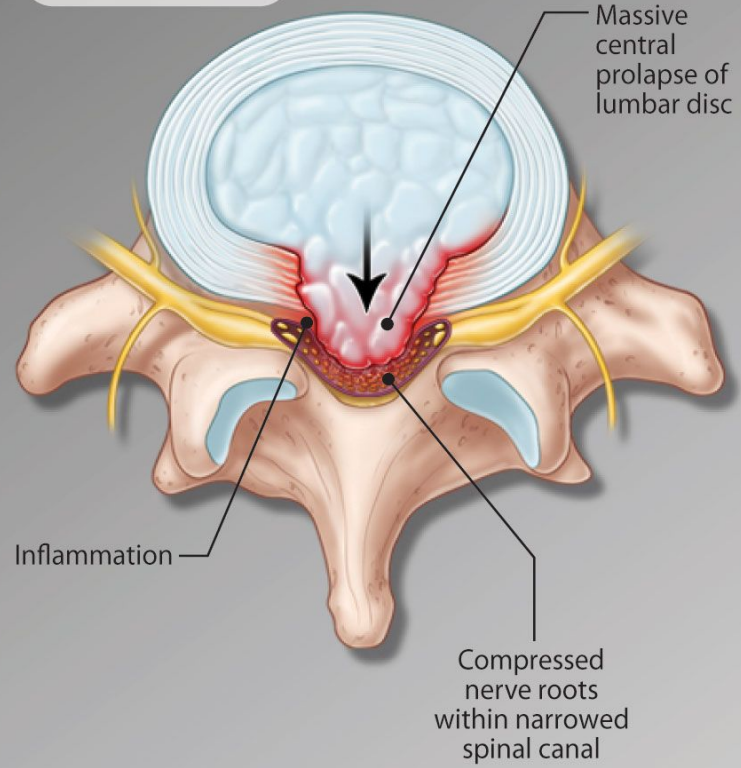
The most common cause of sciatica is a bulging disk or herniated disk





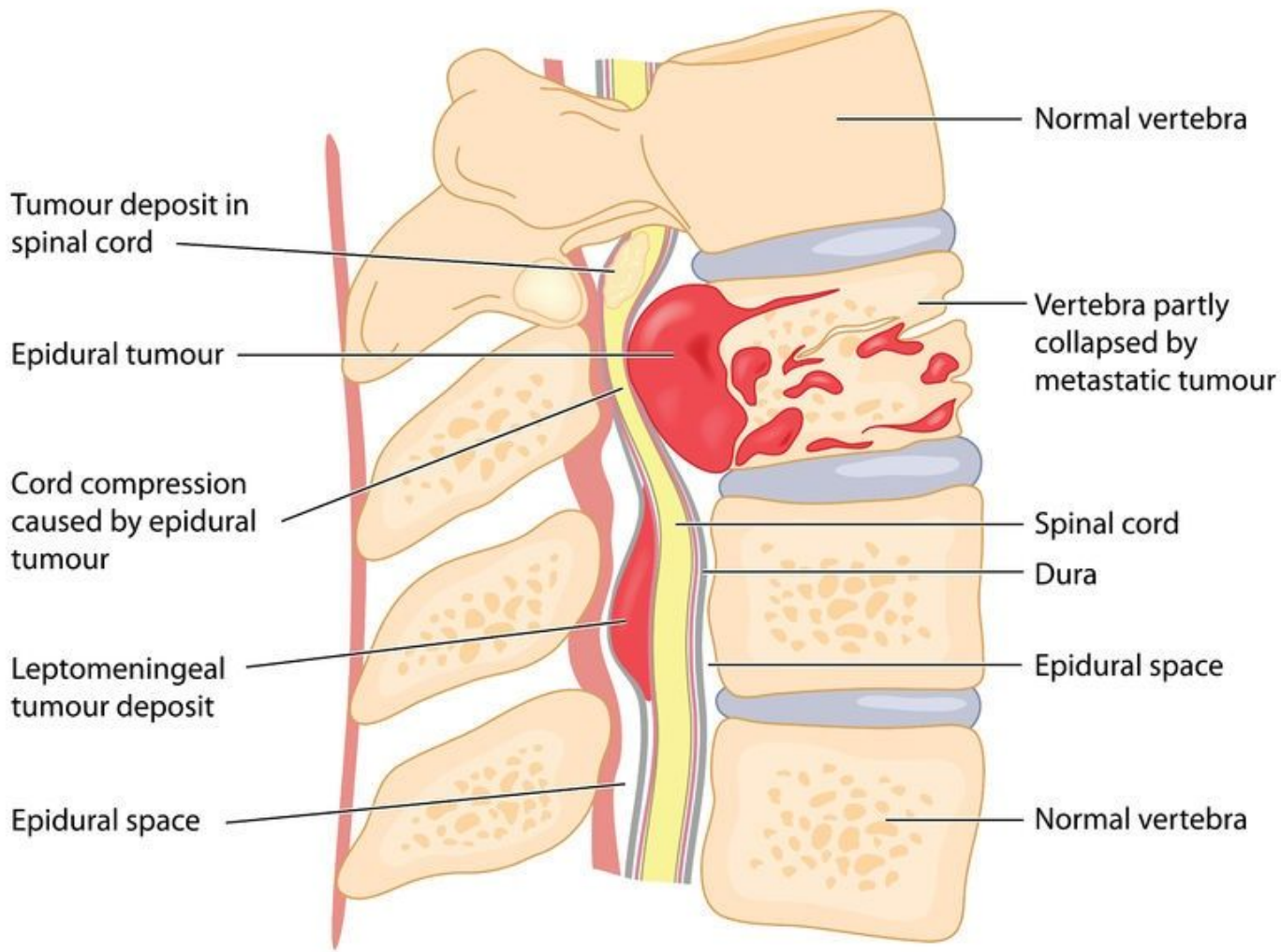
# Cauda Equina Syndrome (CES)

## CAUDA EQUINA SYNDROME



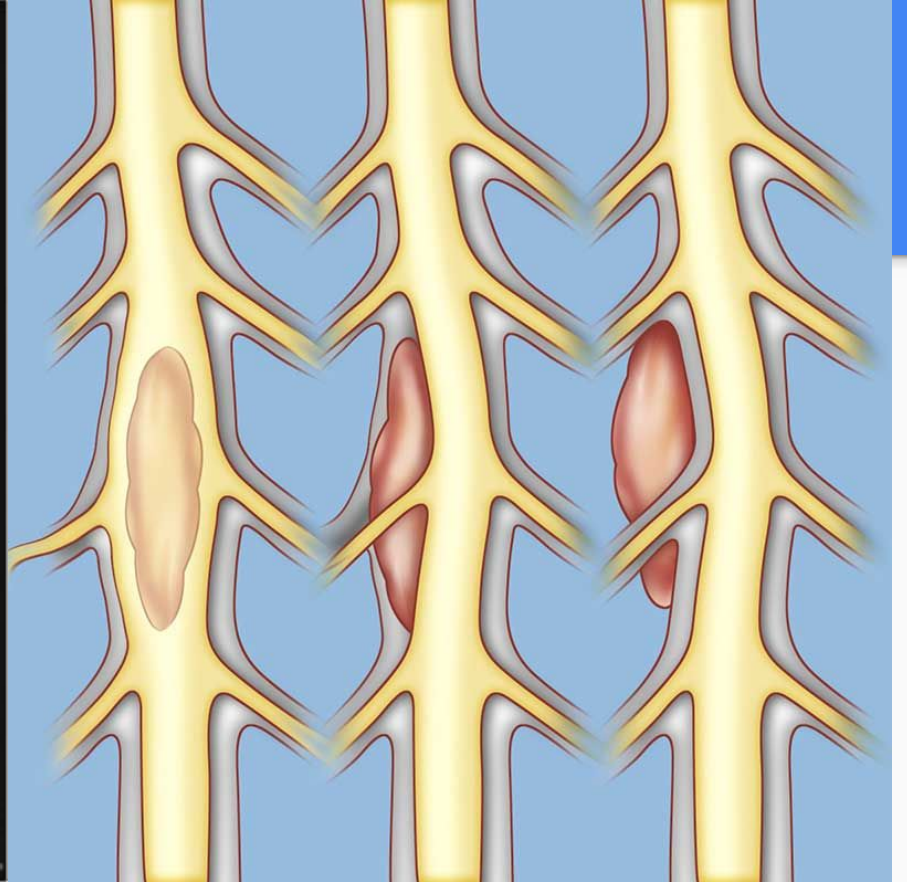
# Malignancy

- Tumors are a rare cause of back pain, but it is always important to rule out.
- It can be primary or secondary (metastatic).
- It is most commonly metastatic, causing neoplastic epidural spinal cord compression (ESCC).
- Prostate, Breast, and Lung mets comprise 60% of the cases (20% each).
- Back pain can also be associated with multiple myeloma.





Tumor type	Usual site of presentation	Common age of presentation
Osteoid osteoma	Posterior element	2-3 <sup>rd</sup> Decade
Osteoblastoma	Posterior element	2-3 <sup>rd</sup> Decade
Osteosarcoma	Posterior element	4 <sup>th</sup> Decade
Osteochondroma	Any site/common spinous process	3 <sup>rd</sup> Decade
Chondromyxoid fibroma	Posterior element	3 <sup>rd</sup> Decade
Chondrosarcoma	Vertebral body/posterior element/both	3 <sup>rd</sup> Decade
Hemangioma	Vertebral body	4 <sup>th</sup> Decade
Lymphangioma/ Hemangioendothelioma	Vertebral body	2-8 <sup>th</sup> Decade
Plasmacytoma/multiple myeloma	Vertebral body	60 years
Leukemia	Diffuse	Children
Lymphoma	Vertebral body/paraspinal	5-7 <sup>th</sup> Decade
Aneurysmal bone cyst	Posterior element	5-20 years
Giant cell tumor	Vertebral body	3-5 <sup>th</sup> Decade
Ewing's sarcoma	Posterior element	2 <sup>nd</sup> Decade
Chondroma	Sacrococcygeal and Sphenooccipital areas	5-6 <sup>th</sup> Decade



# A child with back pain and no history of trauma?

- **Spinal astrocytomas** are the second most common spinal cord tumors in adults (40%), and the most common in children (60%).
- Peak age: 30s, M:F = 3:2
- Increased incidence with neurofibromatosis type 1.
  
- **Spinal ependymomas** are the most common spinal cord tumors in adults (60%), and the second most common in children (30%).
- Peak age: 40s, M > F
- Increased incidence with neurofibromatosis type 2.

# Role of Primary Health Care in Management

Renad AL-qahtani



**A patient suffering from back pain books an appointment in a private hospital.**

Does he really know where to go? Neuro? Ortho? Onco? ..etc?

**Family physician plays an important role in ensuring :**

- 1- Patient-centered care
- 2- Cost effective care
- 3- Time effective care
- 4- Comprehensive approach

# Role of PHC in Management

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graph TD; A[Role of PHC in Management] --> B[Initial evaluation]; A --> C[management];
```

## Initial evaluation

- Identifying** the Presenting problem through Hx , examination etc.
- Ask** about and address the patient's concerns and goals. (patient centered care)
- Achieve** shared understanding of the problem with pts
- To** consider other problems (continuing problem)

## management

- Relief** the pain.
- Improve** associated symptoms, such as sleep or mood disturbances or fatigue.
- Maximize** functional status.

**Most important** to involve the patient in the management and encourage him to accept appropriate responsibility

# Management Options

- Analgesics
- NSAIDs
- Muscle relaxants
- Bed rest vs staying active?

Massage? Back specific exercise therapy? Heat / Cold therapy? Acupuncture?

# Role of PHC in Management

```
graph TD; A[Role of PHC in Management] --> B[Referral of complicated cases.]; A --> C[prevention & education];
```

**Referral of complicated cases.**

**-When referring keep in mind :**

1-RED FLAGS.

2-Differentials

3-Causes of referral.

**prevention & education**

**-Educate** the patient about the natural history of back pain.

**-modify** behavioral risk factors



# When to Refer to a Specialist

Farrah Mendoza



- T** TRAUMA
- U** UNEXPLAINED WEIGHT LOSS
- N** NEUROLOGIC SYMPTOMS
- A** AGE >50
- F** FEVER
- I** INTRAVENOUS DRUG USE
- S** STEROID USE
- H** HISTORY OF CANCER

# RED FLAGS

# TUNA FISH

Emergency: referral within hours

Urgent: referral within 24 to 48 hours

Soon: referral within weeks

# 1. Level of low back and/or leg pain

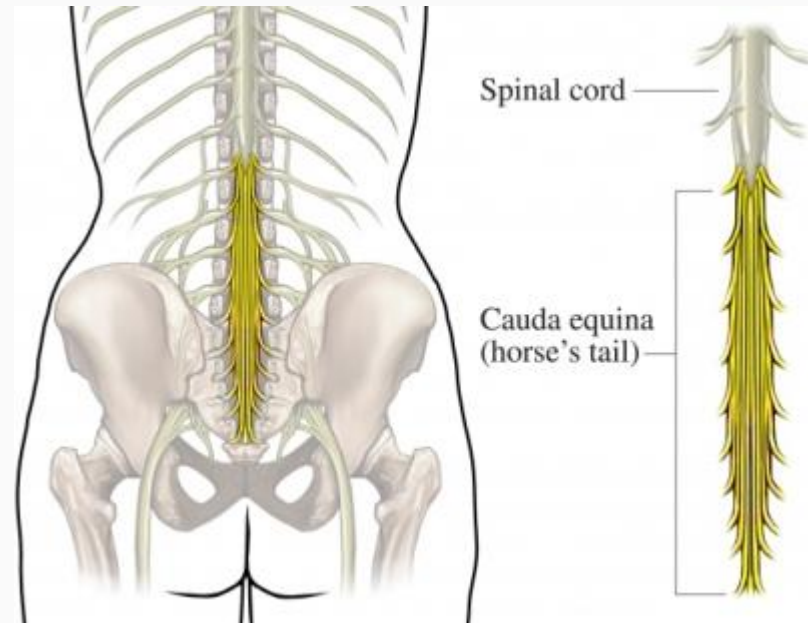
- If pain is not alleviated by non-surgical treatments and has continued for a few weeks or months → Spine surgeon (Orthopedic)
- If the pain is severe, then it may be advisable to consult with a spine specialist soon

## 2. Ability to function with low back pain

- If the patient's ability to continue to function in everyday activities (work, driving, etc.) is impaired, it's advisable to consider going to a specialist soon.
- While waiting to be seen by a specialist: analgesia, tests for diagnosis but the results may be inconclusive

# 3. Cauda Equina Syndrome

- Sudden onset of new urinary retention, fecal incontinence, saddle (perineal) anesthesia, radicular (leg) pain often bilateral, loss of voluntary rectal sphincter contraction → ER



## 4. Infection or Tumor

- Severe unremitting (non-mechanical) worsening of pain at night and when lying down → urgent

# 5. Significant Trauma or Fracture

Urgent referral to ER for pain control → needs prompt investigation

Urgent referral to spinal surgery



## 6. Use of IV drugs or steroids

### Urgent investigation required

- In case of suspected infection, consider blood work (CBC, ESR and CRP). If blood work is positive, proceed to MRI
- In case of suspected compression fracture, proceed to standing AP and lateral Xrays.
- Risk factors for compression fractures include: severe onset of pain with minor trauma

## 7. Weight loss, fever, loss of appetite

Refer urgently for MRI scan and to spinal surgery, if indicated

# 8. Widespread Neurological Signs

Investigate further and refer soon if indicated

## Red Flags: Indication for Referral

ER	<ul style="list-style-type: none"><li>● Cauda Equina Syndrome → Emergency</li><li>● Severe unremitting worsening of pain → Urgent</li></ul>
Neurosurgery/ Orthopedics	<ul style="list-style-type: none"><li>● Significant Trauma/Fractures → Urgent</li><li>● Weight loss, fever, history of cancer/HIV → Urgent</li></ul>
Neurosurgery	<ul style="list-style-type: none"><li>● Use of IV drugs or steroids → Urgent</li><li>● Patient &gt;50yrs (first episode of serious back pain) → Soon</li><li>● Widespread neurological signs → Soon</li></ul>

# Surgical Evaluation

- Urgent/Emergency
  - Cauda Equina Syndrome
  - Fracture
- Elective
  - Herniated Lumbar Disk
  - Spinal Stenosis

# Diagnostic Evaluation



## Acute Lower Back Pain

PHC:

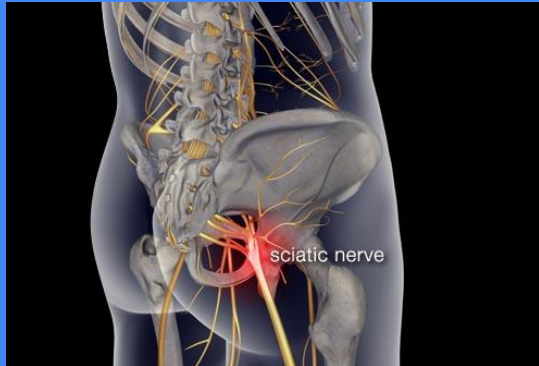
Not improving → Referral for Physical  
Treatments

Persistent pain despite physical treatment

Referral:

Orthopedic or Rheumatologist for diagnostic  
evaluation

# Diagnostic Evaluation



- Sciatica
- Abnormal Nerve Root Findings (strength, sensation, reflex)

PHC: Conservative Treatment

Referral:

- Neurologist
- Orthopedic
- Neurological Surgeon

# Prevention & Education

Rahaf AlMutairi



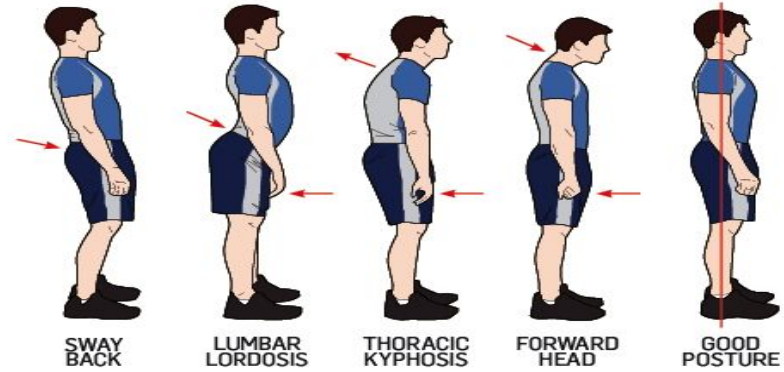


# Losing Weight

- Too much upper body weight can strain the lower back.
- Maintain a healthy weight, Being overweight puts added pressure on your spine and lower back.



# Posture

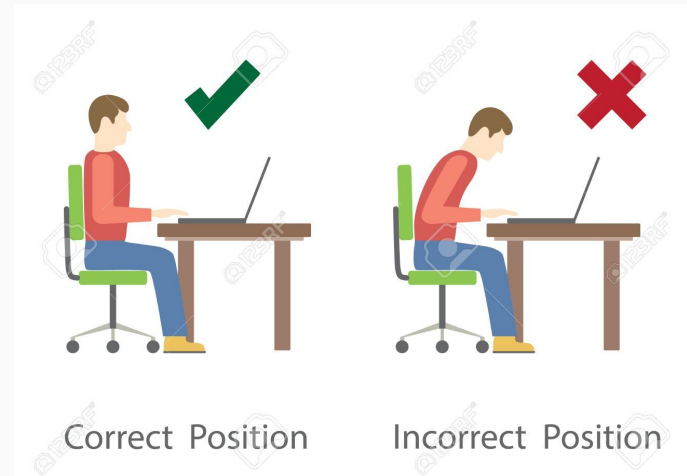


How you sit, stand and lie down can have an important effect on your back. The following tips should help you maintain a good posture:

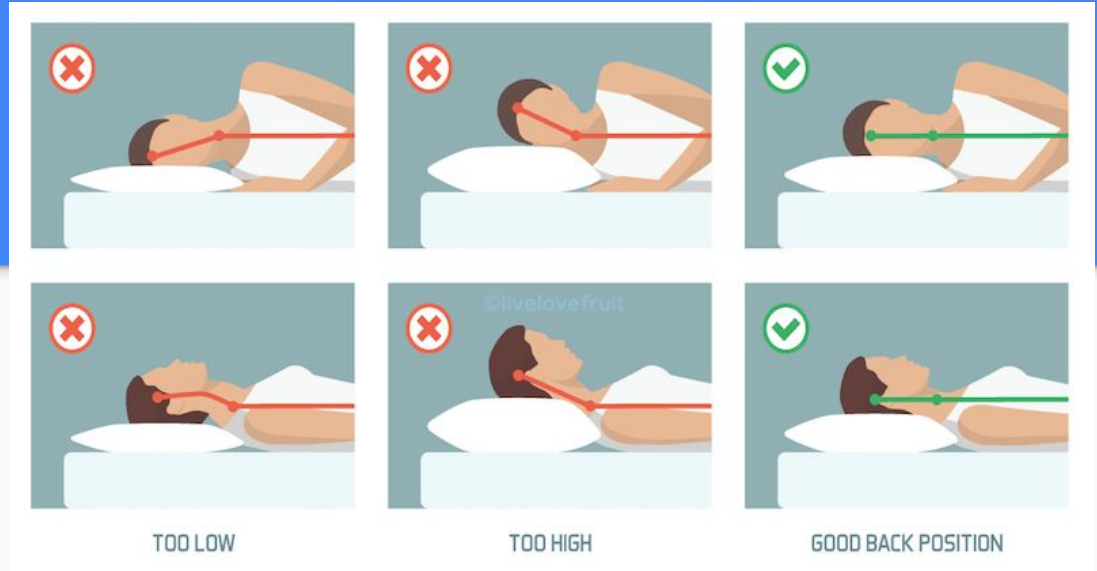
- **Standing:** Stand upright, with your head facing forward and your back straight. Balance your weight evenly on both feet and keep your legs straight.

# Posture

- **Sitting and driving:** Sit up with your back straight and your shoulders back. Your knees and hips should be level and your feet should be flat on the floor.



# Sleeping



- Your mattress should be firm enough to support your body while supporting the weight of your shoulders and buttocks, keeping your spine straight

# Lifting and Carrying

One of the **biggest** causes of back injury is lifting or handling objects incorrectly

- Think before you lift: can you manage the lift?
- Start in a good position
- Keep your head up
- Know your limits
- Push rather than pull



# Exercise

Exercise is both an **excellent** way of preventing back pain and of reducing it, but **should seek medical advice before starting an exercise programs if you've had back pain for six weeks or more.**



ROLE PLAY

[www.menti.com](https://www.menti.com)

11633





# MCQs



Patient came to the clinic complaining of low back pain, in examination the big toe extension is weak, which nerve root you think is involved?

- A. L3
- B. L4
- C. L5
- D. S1

What is the leading cause of sciatica?

- A. Piriformis syndrome
- B. Spinal stenosis
- C. Spinal disc herniation
- D. **Spondylolisthesis**

Which one of the following is do you think is appropriate to referral ?

- A. Fractures
- B. Caude equina
- C. **A+B**
- D. Undiagnosed back pain
- E. All of the above

Which of the following is characteristic of a history of mechanical Lower Back Pain?

- A. Relatively acute onset
- B. History of overuse or a precipitating injury
- C. Pain worse during the day
- D. **All**

Which of the following is an excellent way of preventing and reducing back pain?

- A. **Exercise**
- B. Wearing proper shoes
- C. Losing weight
- D. Maintain a good posture

Thank You!  
Questions?

# Resources:

<https://www.healthdirect.gov.au/back-pain-prevention>

<https://www.bouldercentre.com/news/guidelines-prevent-back-pain>

-<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD007612.pub2/full?highlightAbstract=bed%7Cwithdrawn%7Crest%7Cback%7Cpain>

-<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD000335.pub2/full?highlightAbstract=pain%7Cexercis%7Cwithdrawn%7Cback%7Cexercise%7Cspecific%7Cspecif>

-<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD001929.pub3/full?highlightAbstract=withdrawn%7Cacupuncture%7Cback%7Cpain%7Cacupunctur>