جامعة الملك سعود
King Saud University

Approach to a patient with back pain

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Objectives:

1. Common causes.
2. Diagnosis including history, Red Flags, and Examination.
3. Brief comment on Mechanical, Inflammatory, Root nerve compression, and Malignancy.
4. Role of primary health care in management.
5. When to refer to a specialist.
6. Prevention and Education.

MCQs

1. **What is the leading cause of sciatica?**
    a. Piriformis syndrome
    b. Spinal stenosi
    c. Spinal disc herniation
    d. Spondylolisthesis

2. Why are traumatic injuries to the sciatic nerve relatively uncommon?

a. the nerve is highly resistant to traumatic
b. the nerve repairs itself very quickly so damage is often not noticed
c. the nerve runs deep to a lot of tissue and so is protected
d. the nerve has a thick fibrous coating for protection

3. A 35-year-old male presented with back pain and urinary retention. Which one of the following is important to assess:

a. Active range of motion
b. Anal tone
c. Curvature of spine
d. Leg length inequality

4. Bed rest is indicated in all patients suffering from back pain.

a. True
b. False

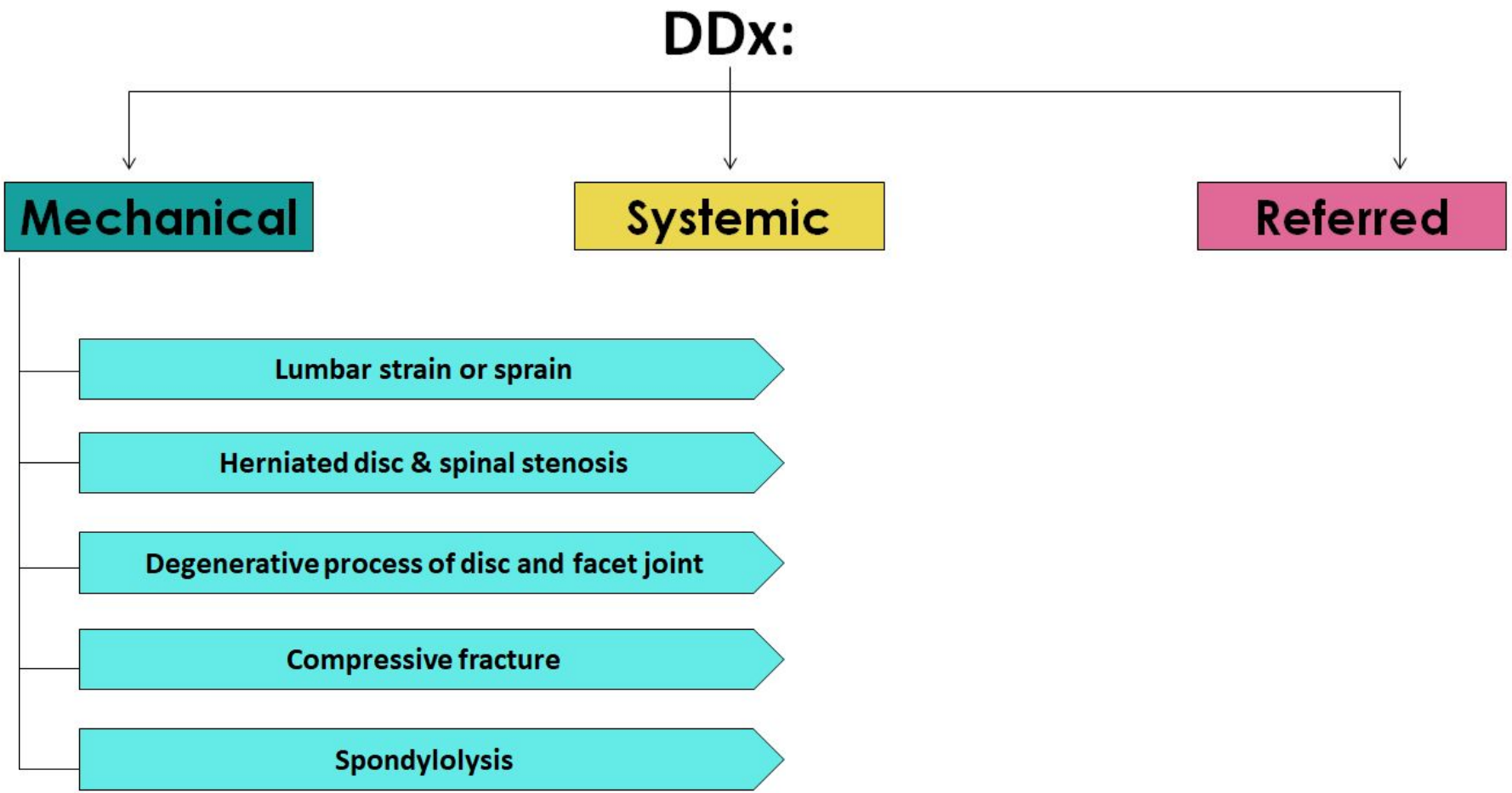
5. Which of the following is an excellent way of preventing and reducing back pain?

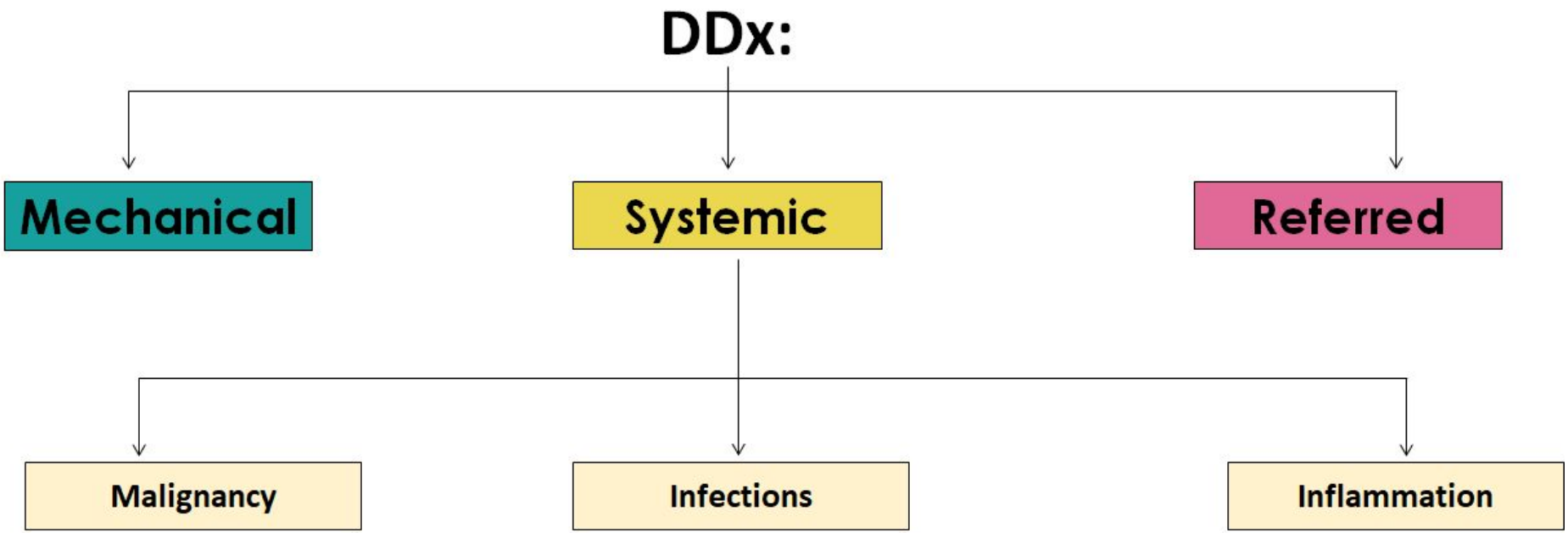
a. Exercise
b. Wearing proper shoes
c. Losing weight
d. Maintain a good posture

6. 35-year-old male presented with back pain, urinary retention, loss of anal tone, anesthesia in the perineal space, what is the best management for him ?

a. Order a MRI
b. Urgent Referral to the orthopaedic
c. Give the patient NSAID and advise him to bed-rest for 3 months
d. Referral to physiotherapy

Common causes


DDx:
Mechanical
Systemic
Referred
Lumbar strain or sprain
Herniated disc & spinal stenosis
Degenerative process of disc and facet joint
Compressive fracture
Spondylolysis


DDx:
Mechanical
Systemic
Referred
Malignancy
Infections
Inflammation

DDx:

- **Mechanical**
- **Systemic**
  - **Malignancy**
    - Primary tumors.
    - Secondary tumors: Metastatic carcinoma.
  - **Infections**
    - Osteomyelitis.
    - TB.
    - Brucellosis.
  - **Inflammation**
    - Spondylitis.
- **Referred**

DDx:

- **Mechanical**
- **Systemic**
- **Referred**
  - **Acute aneurysm**
  - **Pelvic diseases**
    - Prostatitis.
    - Endometriosis.
  - **Renal diseases**
    - Stones.
    - Pyelonephritis.
  - **GI diseases**

Diagnosis including history, Red Flags, and Examination.

How can you approach a patient with back pain?

We start by history and physical examination

History taking of back pain

- 1-Personal History
- 2-Cheif 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

Personal history

- Name
- Age
- Occupation

Chief complaint

- What
- When
- Where

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

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 -in both standing and supine position-

Look- Feel- Move- Special Tests

Starting with standing position

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 Position

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 Position

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.

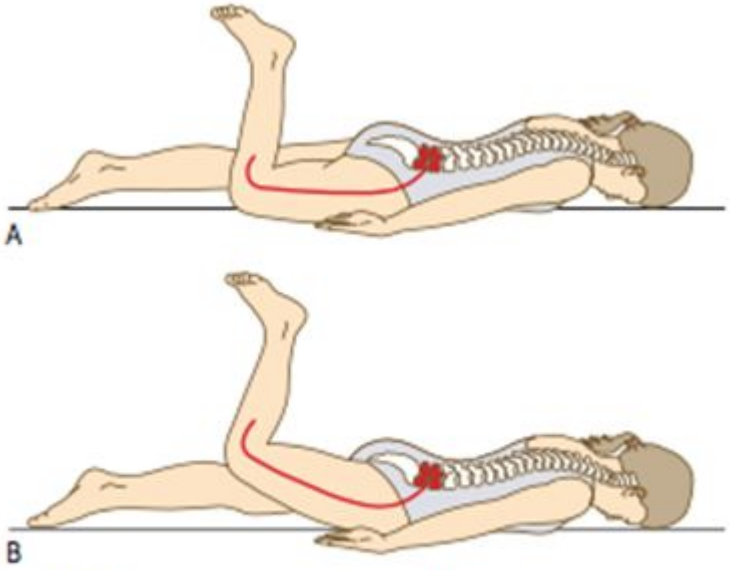


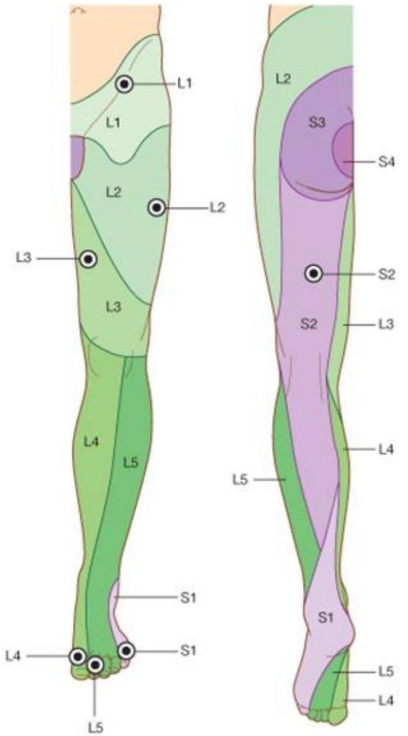
Fig. 14.26 Stretch test: femoral nerve. (A) Pain may be triggered by knee flexion alone. **(B)** Pain may be triggered by knee flexion in combination with hip extension.

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 Examination

- ★ Pedal pulses (dorsalis pedis & posterior tibial artery).
- ★ Capillary refill (normal < 2 seconds).

Brief comment on Mechanical, Inflammatory, Root nerve compression, and Malignancy.

Case 1 ..

Sara, aged 25 is an engineer and a mother who wants to work on her health and fitness goals, but is held back by her back pain. She presented with gradual intermittent lower back pain, feels worse when moving and better when lying down that would result in spasms of the lower back muscles and has also reported that 8 months ago.

Mechanical pain..

- Tends to get better or worse depending on your position – for example, it may feel better when sitting or lying down.
- Typically feels worse when moving
- Can develop suddenly or gradually
- poor posture or lifting something awkwardly, but often occurs for no apparent reason
- May be due to a minor injury

Differential diagnosis :

- Spinal stenosis
- Degenerative processes of disks and facets.
- Herniated disc
- Osteoporotic fracture
- Traumatic fracture
- Transitional vertebrae spondylosis
- Congenital disease - severe scoliosis and kyphosis.

Case 2 ..

Ahmad is a 21-year-old medical student, who has a two-year history of low back pain radiating down both buttocks and down the posterior aspect of his thighs. The pain and stiffness is eased with movement and exercise, but is much worse at night and with prolonged inactivity. The patient has significant night pain, which prevents him from sleeping properly. The patient also has profound fatigue and difficulty continuing work.

Inflammatory back pain..

- Age at onset of back pain <45 years
- Back pain lasting > 3 months
- Night pain
- Early morning pain and stiffness lasting more than one hour
- Insidious onset
- Tenderness/inflammation over the joint.
- Increased by Rest and relieved by activity.

Differential diagnosis :

- Inflammatory arthritis
- Ankylosing spondylitis
- Psoriatic spondylitis
- Reiter syndrome
- IBD

Malignancy..

- Metastatic tumors are found mostly in patients older than 50 years .
- Metastatic disease is more common than primary tumors of the spine, and thoracic spine metastatic lesions are more common than lumbar.
- Patient usually has constitutional symptoms such as fever ,weight loss, loss of appetite and N\V

Differential diagnosis :

- Multiple myeloma
- Metastatic carcinoma
- Lymphoma and leukemia
- Spinal cord tumor
- Retroperitoneal tumors
- Primary vertebral tumors

Nerve root compression..

- Characterized by radicular pain arising from nerve root impingement due to herniated discs.
- Radicular pain: Pain that radiates into the lower extremity directly along the course of a spinal nerve root.

Causes of lumbar disc herniation :

1. Trauma or injury to the disc
2. Disc degeneration (inflammatory process)
3. Congenital predisposition

risk factors :

1. age
2. smoking
3. Physically demanding jobs
4. Obesity
5. Trauma

Signs and symptoms..

Role of primary health care in management.

General Overview - Role of PHC

- **Ask** about and address the patient's concerns and goals.
- **Relieve** the pain.
- **Improve** associated symptoms, such as sleep or mood disturbances or fatigue.
- **Maximize** functional status.
- **Educate** patients about the natural history of back pain.
- **Prevention** heavy lifting, socio-demographic factors such as smoking and obesity.
- **Referral** of complicated cases.

BUT WAIT! What about real-life practice?

Away from textbooks, why is PHC important?

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 Medicine, in addition to the previous, is:

- **Cost effective for the patient.**
- **Time effective.**
- **Patient-centered.**

Approach of a Family Physician

WHAT TO KEEP IN MIND?

- **RED FLAGS.**
- **Differentials (ordered by the most common.)**
- **Causes of referral \ indications for diagnostics.**

Steps: History, Examination, Management, Follow-up accordingly.

* Diagnostic\ Lab tests\ referral if needed.

Management Options

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

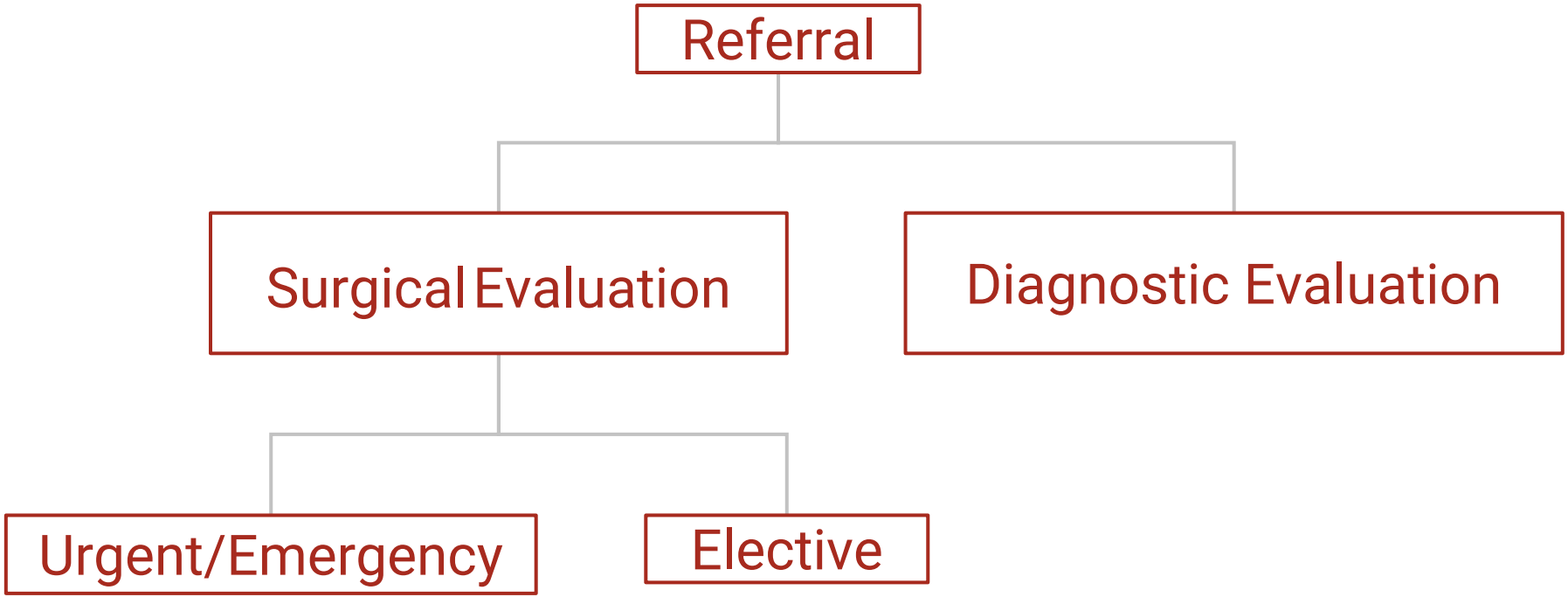
Massage?

Back specific exercise therapy?

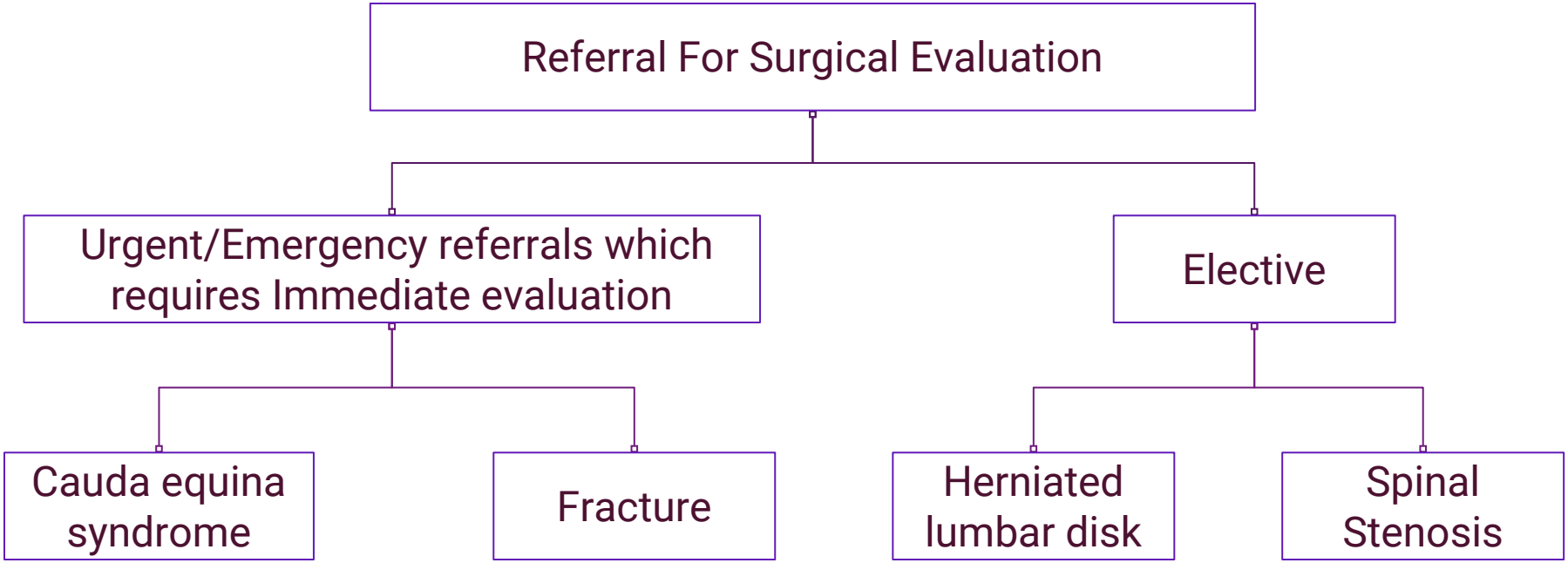
Heat / Cold therapy?

Acupuncture?

When to refer to a specialist.


Referral
Surgical Evaluation
Diagnostic Evaluation
Urgent/Emergency
Elective

When to Refer for Surgical Evaluation



When to Refer for Diagnostic Evaluation

It is appropriate to consider referral if a serious spine condition is suspected

- Tumor
- Infection
- Fracture
- Other suspected space-occupying lesion

When to Refer for Diagnostic Evaluation

Patients with	PHC	Referral
● Sciatica ● Abnormal nerve root findings (abnormal strength, sensation, reflex)	Conservative therapy	❖ Neurologist ❖ Orthopedic ❖ Neurological surgeon

When to Refer for Diagnostic Evaluation

Acute Lower Back Pain

PHC	Persistent	Referral
For acute lower back pain that is not improving, initial referral is usually for physical treatments.	Patients with persistent symptoms despite physical treatments	❖ Orthopedists ❖ Rheumatologists for diagnostic evaluation.

Red Flag Symptoms of Back Pain

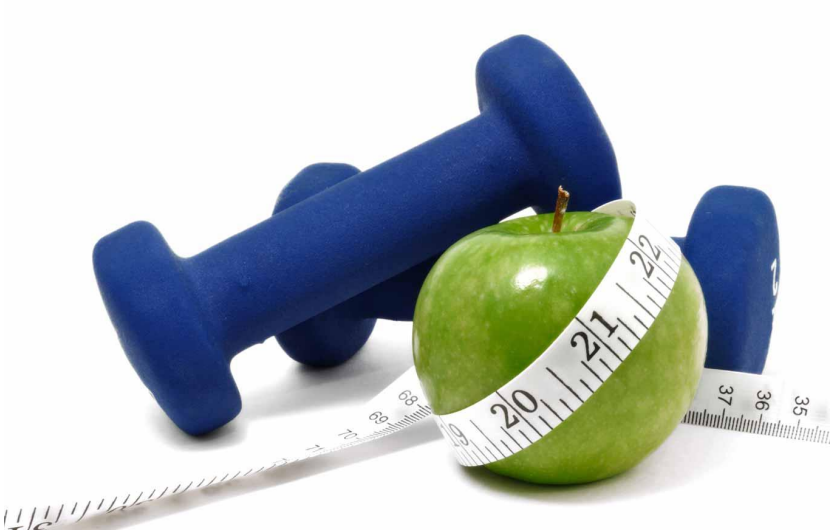
TUNA FISH

- **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

Prevention and education.

1- Losing Weight

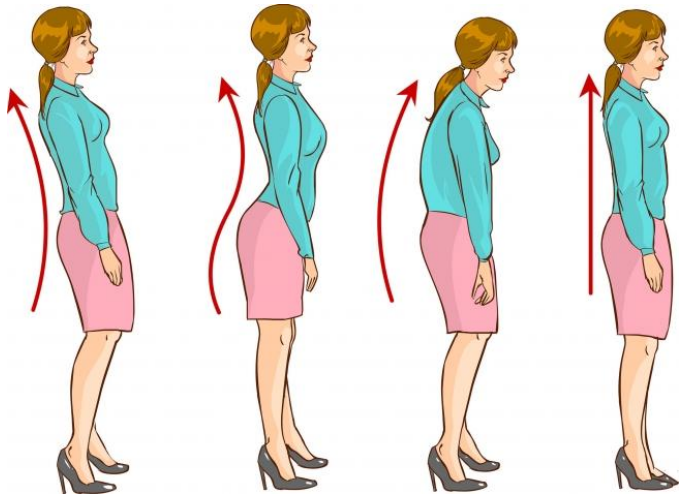
Too much upper body weight can strain the lower back.



2- 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.



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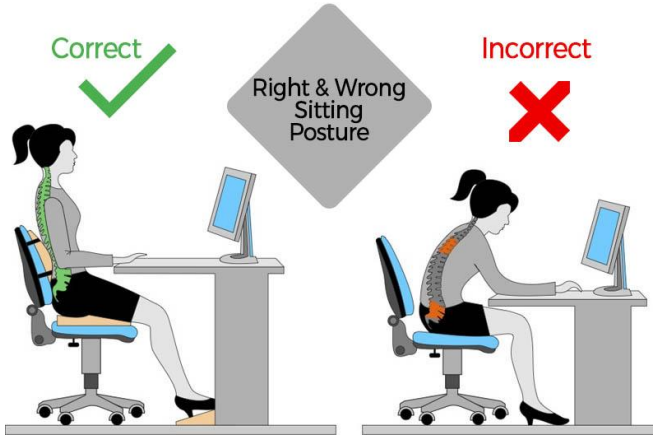
- **Sitting:** Sit up with your back straight and your shoulders back. Your knees and hips should be level and your feet should be flat on the floor.



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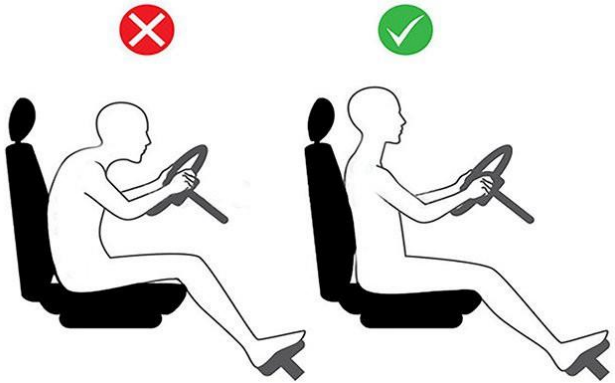
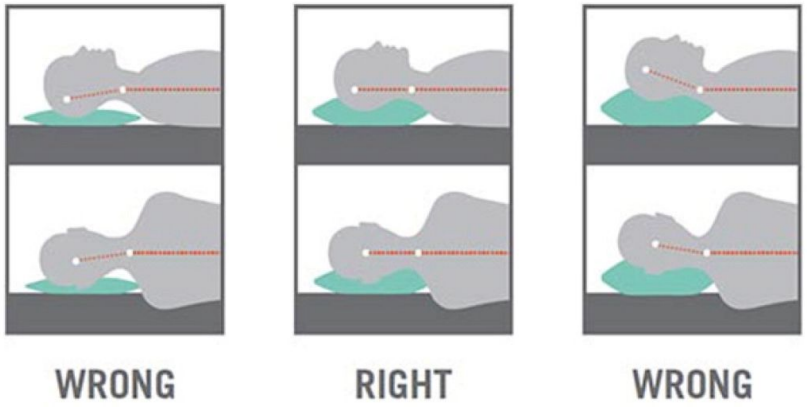
- **Driving:** Correctly positioning your wing mirrors will prevent you from having to twist around. If driving long distances, take regular breaks so that you can stretch your legs.



3- Sleeping

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

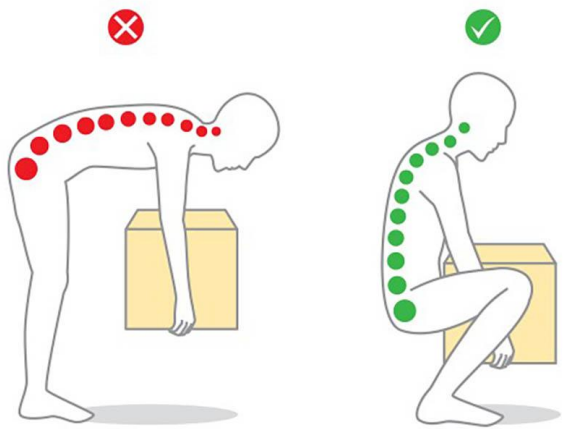
Support your head with a **pillow**, but make sure that your neck is not forced up at a steep angle.



4- 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



5- Exercising

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.

Exercises **such as** walking or swimming strengthen the muscles that support your back or activities such as yoga.

6- Wearing Proper Shoes

Wearing flat shoes with cushioned soles – these can reduce the stress on your back.

MCQs

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a. True
b. False

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

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b. Wearing proper shoes
c. Losing weight
d. Maintain a good posture

6. 35-year-old male presented with back pain, urinary retention, loss of anal tone, anesthesia in the perineal space, what is the best management for him ?

a. Order a MRI
b. Urgent Referral to the orthopaedic
c. Give the patient NSAID and advise him to bed-rest for 3 months
d. Referral to physiotherapy

Thank you!

Any questions?

Resources:

- https://www.healthdirect.gov.au/back-pain-prevention
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1495170/
- https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004750.pub2/full?highlightAbstract=heat%7Cwithdrawn%7Cback%7Cpain
- 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
- Orthopedic department back examination handout
- Apley and solomon’s system of orthopaedics and trauma 10th edition