

# APPROACH TO A PATIENT WITH BACK PAIN

Supervisor: Dr. Amr Jamal



# PRESENTATION DONE BY:

Abdulaziz Mustafa Shadid

Mohammed Khalid Alayed

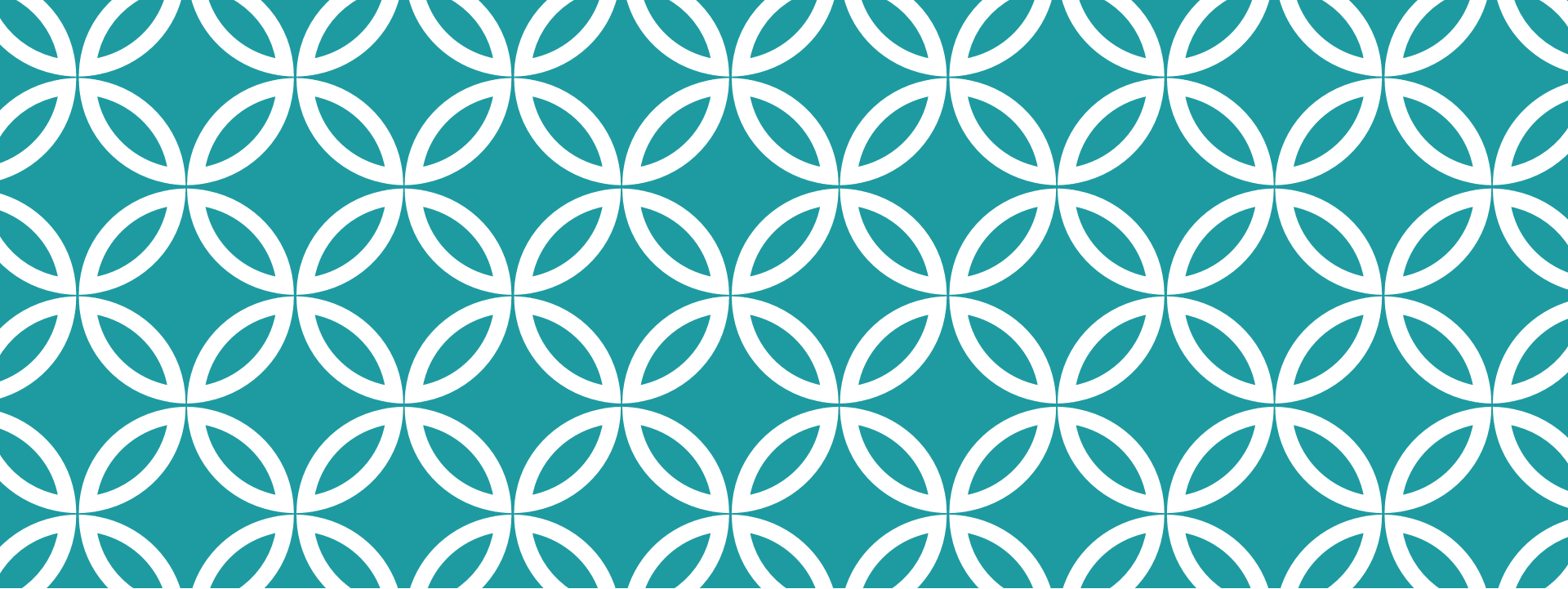
Faisal Salahuddin Alfawaz

Mohammad Ibrahim Almutlaq

Khaleel Ghalayini

# 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**



# MCQS

- Which one of the following is the leading cause of sciatica?
  - A. Piriformis syndrome
  - B. Spinal stenosis
  - C. Spinal disc herniation
  - D. Spondylolisthesis

# MCQS

- 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

# MCQS

▪ Which one of the following is the most common site for disc herniations?

A. L5-S1

B. L4-L5

C. T1-T2

D. T10-T11

# MCQS

- Which one of the following is the most common cause for lower back pain?
  - A. Ankylosing spondylitis
  - B. Muscle strain
  - C. Vertebral fracture
  - D. Spinal stenosis



# MCQS

- A 44 years old women came to the physician because several months history of low back pain that started gradually. Pain is worst in the morning and associated with stiffness which become better throughout the day.

Which one of the following is most likely the cause of her pain?

- A. Muscle strain
- B. Vertebral fracture
- C. Spinal disc herniation
- D. Ankylosing spondylitis



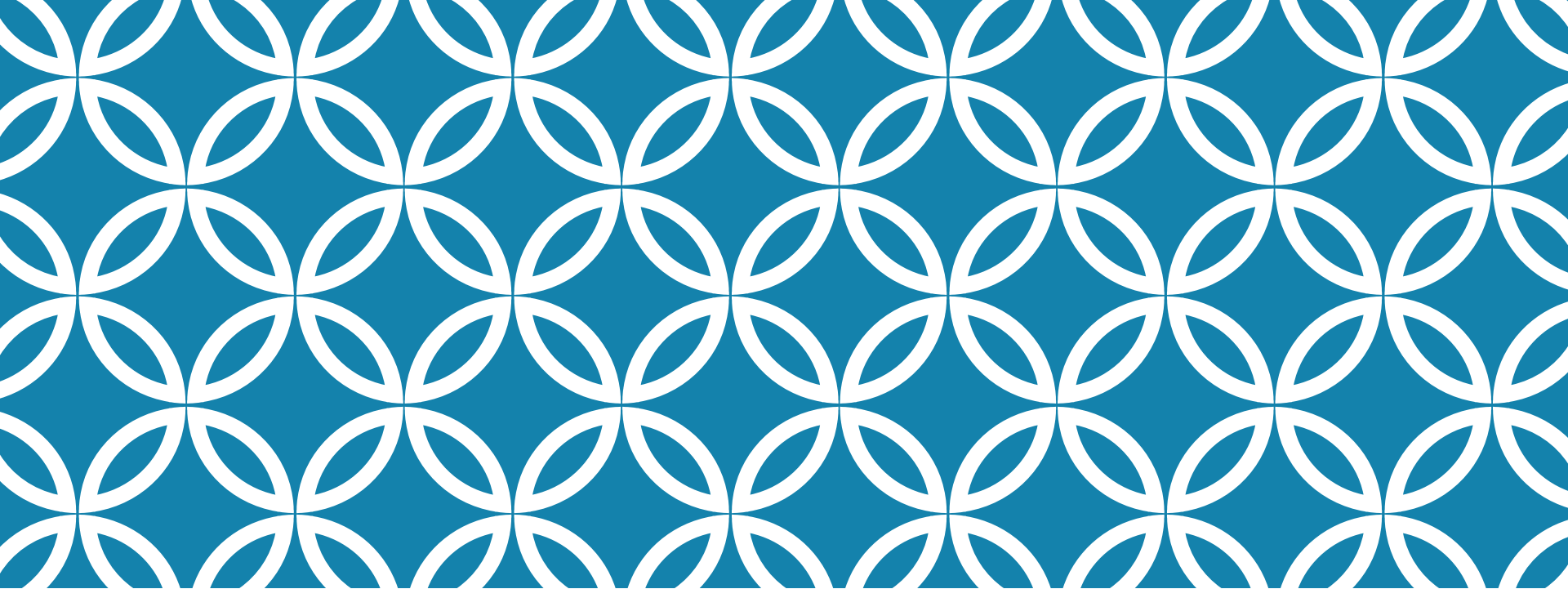
# CASE SCENARIO



# CASE SCENARIO..

SARA, a 46 years old women came to you because of increasingly sever lower back pain for the past week.

DDx:?



# COMMON CAUSES



# BACK PAIN

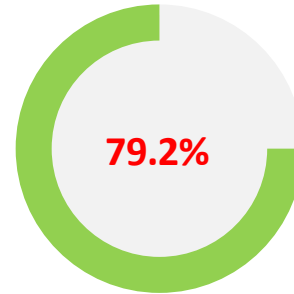
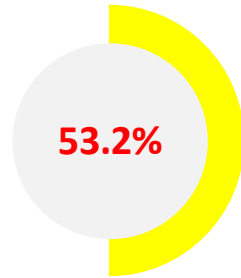
In USA it is the commonest cause of **limitation** of activity in those under the age of 45. <sup>(1)</sup>

The lifetime prevalence of non-specific (common) low back pain is estimated at **60–70%** <sup>(1)</sup>

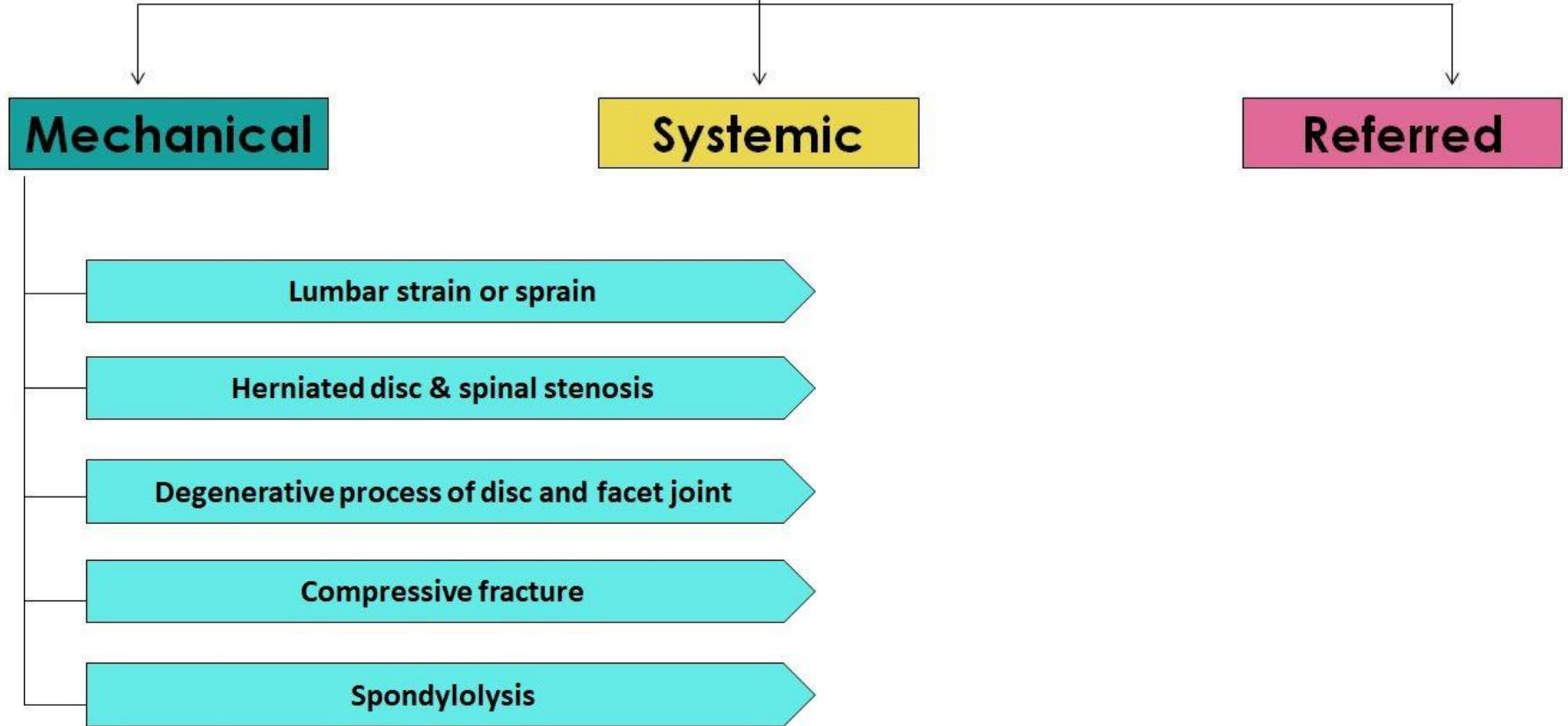


# BACK PAIN

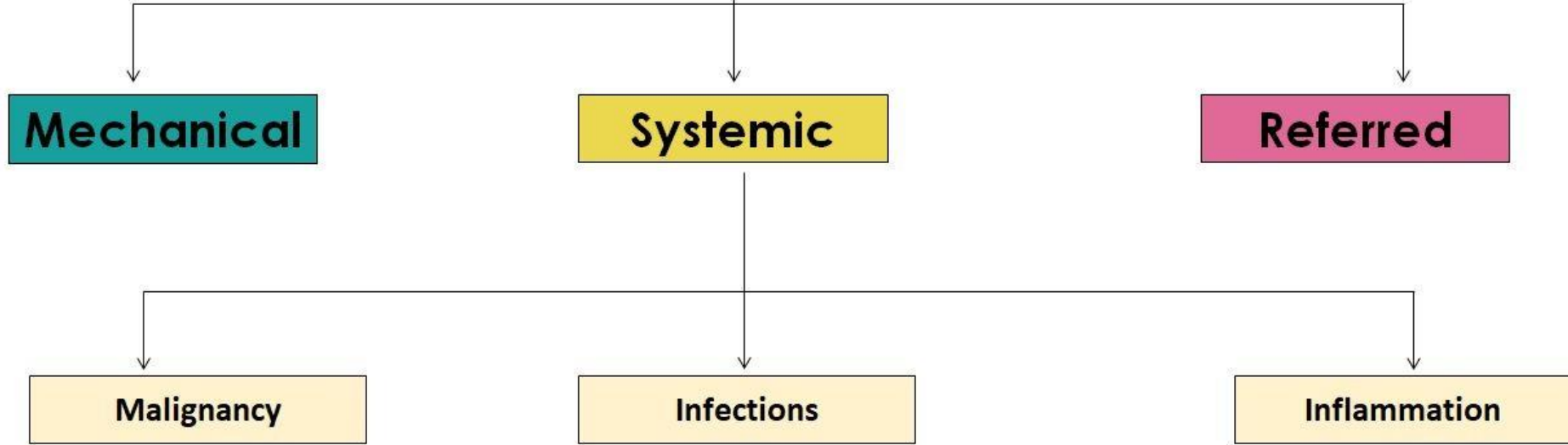
In **Saudi Arabia** Seven studies were cross-sectional and found a prevalence and pattern ranging from 53.2% to 79.17%. (2)



# DDx:

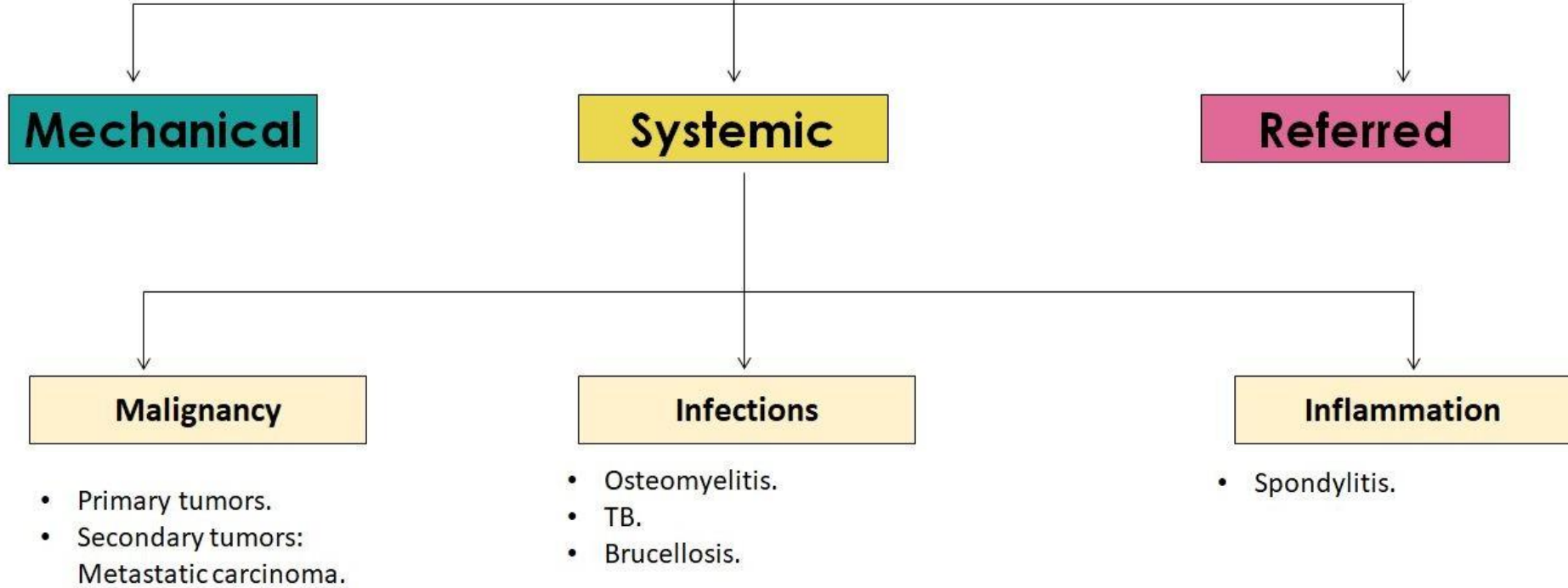


**DDx:**





# DDx:



# DDx:

**Mechanical**

**Systemic**

**Referred**

**Acute aneurysm**

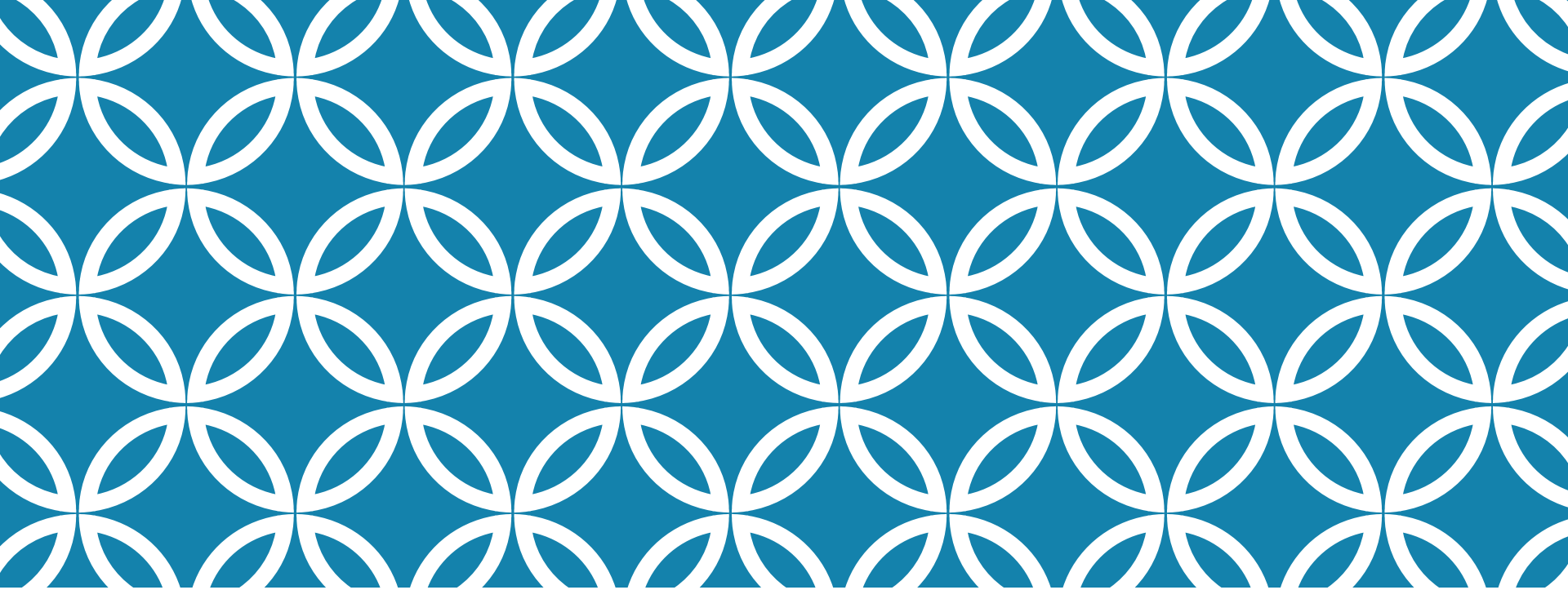
**Pelvic diseases**

- 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**

## CASE SCENARIO..

SARA, a 46 years old women came to you because of increasingly sever lower back pain for the past week.

Question you want to ask sara?

# 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
- 11- ICE
- 12- Explain investigations

# 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



# PAST HISTORY

- Past medical history (Including cancer and psychiatric issues)
- Past surgical History
- Past trauma
- History of blood transfusion

# CONSTITUTIONAL SYMPTOMS & RED FLAGS

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

-  TRAUMA
-  UNEXPLAINED WEIGHT LOSS
-  NEUROLOGIC SYMPTOMS
-  AGE >50
-  FEVER
-  INTRAVENOUS DRUG USE
-  STEROID USE
-  HISTORY OF CANCER

# **MEDICATIONS HISTORY INCLUDING ALLERGY OR STERIODS**

# FAMILY HISTORY

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

# SOCIAL HISTORY

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

# Don't forget ICE

How does it affect the patient  
**functionally** and **mentally**

- IDEAS
  - Concerns
  - Expectations
-

# CASE SCENARIO..

**Personal History:** 46 years old Saudi women, used to be a teacher

**Chief complaints:** sever lower back pain for the last week.

**HPI:**

**Site:** lower back, mainly midline

**Onset:** pain started in the morning after she left heavy boxes the day before.

**Course\Character:** pain is continuous, increasing in severity over time.

**Radiation:** NO

**Exacerbating factors:** mild activity

**Alleviating factors:** pain killers

**Time:** no specific time

**Severity:** 9 out of 10

**Associated symptoms:** fatigue

**No similar episodes in the past**

# CASE SCENARIO..

**Constitutional symptoms & Red flags:** she mentioned some change in appetite and lost 3kg over the last 2 month, but she also mentioned that she is on low carb diet.

**Trauma:** she remember lifting heavy objects one day before starting of the pain.

**Hx of cancer:** six month ago the patient underwent a lumpectomy for lobular carcinoma of the right breast. She has under gone multiple cycles of radiotherapy.

**Medication:** ibuprofen 400 2 times daily when the symptoms started

**Allergy:** null

**Family:** no history of similar condition or history of cancer

**Social:** no smoking. Alcohol, or illicit drug use, she used to be a teacher in elementary school

# CASE SCENARIO..

- Sara thinks she injured her back and that is what causing the symptoms. since the pain was so sever, she was anxious that it could be fracture or disc herniation since a lot of her friends have it.
- She was expecting an x-ray to make sure everything is fine.



# **PHYSICAL EXAMINATION**

## **-IN BOTH STANDING AND SUPINE POSITION-**

Look- Feel- Move- Special Tests



# **APPROACH TO THE LOW BACK EXAM**

## **STANFORD MEDICINE 25**

<https://www.youtube.com/watch?v=q1gX9hORtLY>



# STARTING WITH STANDING POSITION

# LOOK (INSPECTION)

- ★ 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) and check for muscle wasting
- ★ shoulders & pelvis level. (7)(14)(15)

# FEEL (PALPATION)

- ★ Palpate spinous processes for tenderness, steps or gaps.
- ★ Soft tissues: temperature, tenderness.
- ★ Patient should be in prone position.
- ★ Palpation occurs:
  1. centrally
  2. unilateral
  3. Soft tissues
  4. After warning the patient, lightly percuss the spine with your closed fist and note any tenderness. (7)(14)(15)

# MOVE

★ There are three main movements of the lumbar spine:

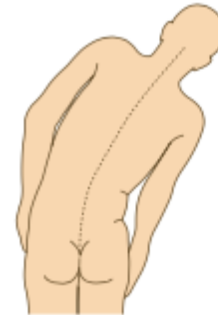
1. Flexion
2. Extension
3. Lateral bending
4. Rotation (7)(14)(15)(16)



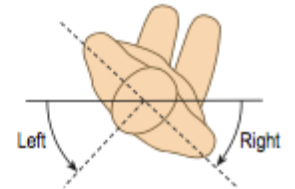
Flexion



Extension



Lateral flexion



Rotation

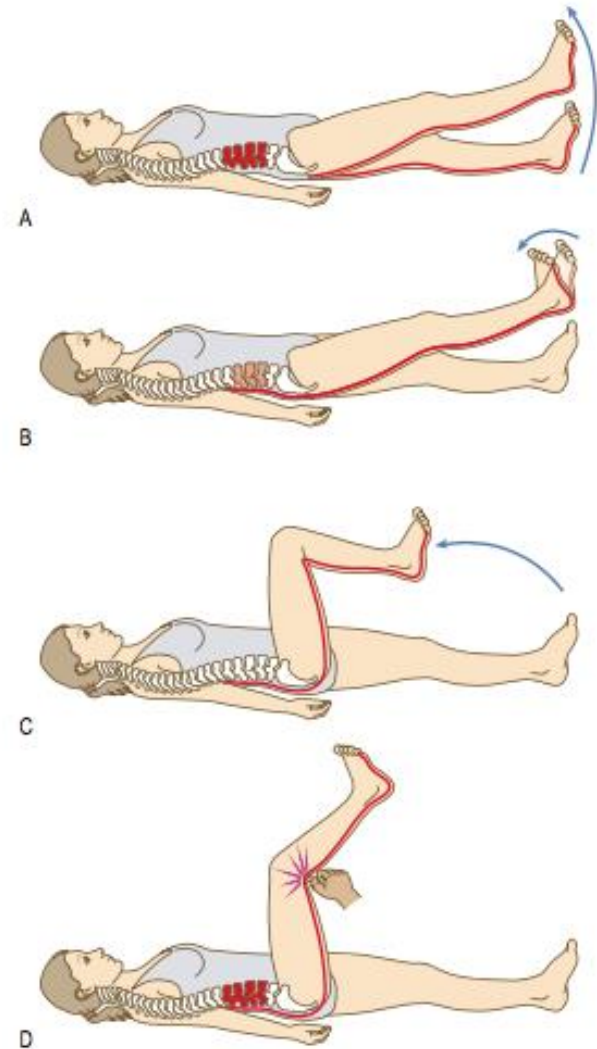
## SPECIAL TEST

- ★ 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

# SPECIAL TEST (SLR)

## ★ Straight leg raising (SLR) test

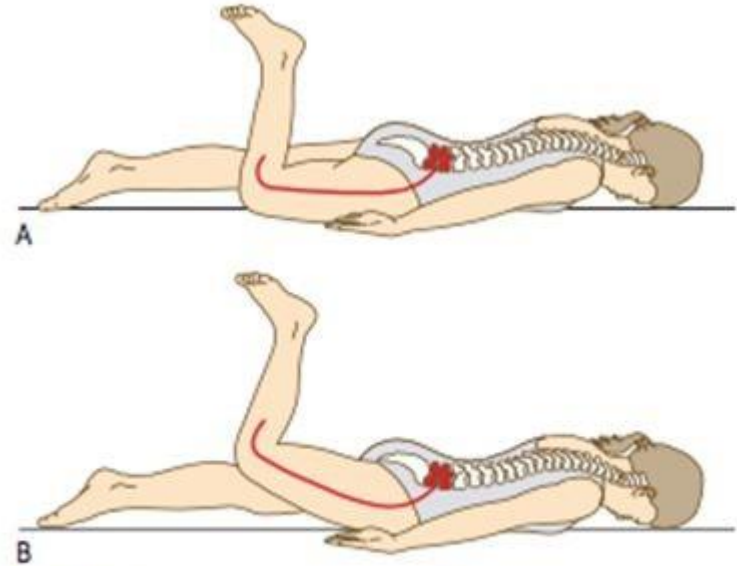
- Done while the patient lying in supine position.
- Tension increased by dorsiflexion of foot (Bragard's test). Root tension relieved by flexion at the knee.
- Pressure over the center of popliteal fossa causes pain locally and radiation into the back.
- Positive test mean that the L4, L5 and S1 nerve roots are involved. (7)(14)(15)
- 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.





# 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.

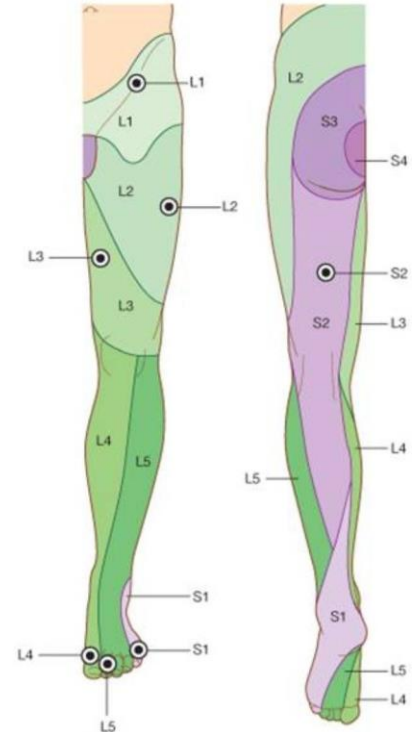


# NEUROVASCULAR ASSESSMENT OF THE LOWER LIMBS

# NEUROLOGICAL EXAMINATION

- ★ Motor: Hip flexion=L2, knee extension=L3, ankle dorsiflexion=L4, big toe extension=L5, Ankle plantar flexion=S.1
- ★ Sensory: dermatomes.
- ★ Tone: normal, flaccid or rigid.
- ★ Reflexes: knee & ankle jerks
- If there is nerve roots compression patient will have pain, paresthesia, anesthesia and weakness, extend into the leg. (7)(14)(15)

Dermatomes of the lower limb



# VASCULAR EXAMINATION

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

# X-RAY



Normal lumbar spine radiographs. A: AP projection. B: Lateral projection.



Metastatic prostate cancer

# CASE SCENARIO..

★ In Sara's case, the only notable finding during the examination was tenderness upon palpation over the lumbar region of the back, special tests were negative and no reduced range of motion.

You order a serum study. All are normal, except: **Alkaline phosphatase 234U/L.**

Importance of Alkaline phosphatase?

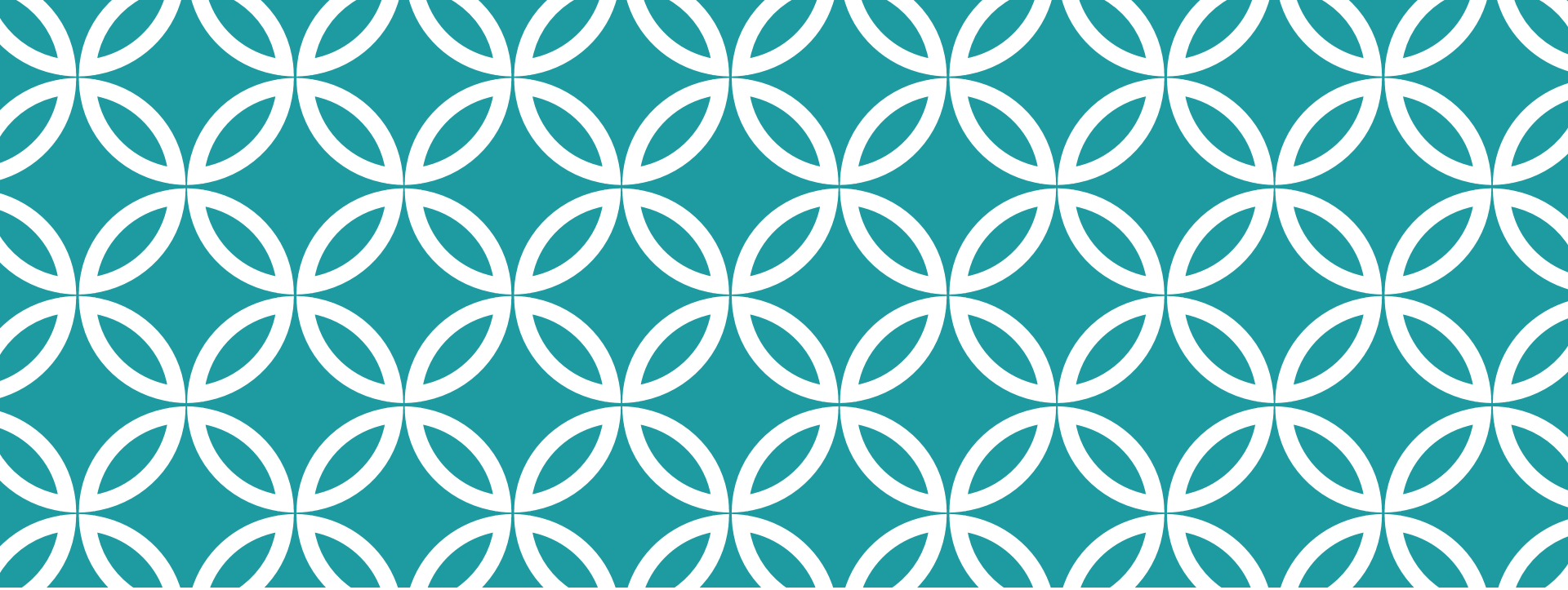
What is most likely the diagnosis?

What's the next step in the management?

# CASE SCENARIO..

**Alkaline phosphatase** is an important laboratory study for evaluating bone disease. If a patient with a history of breast cancer has an increased serum alkaline phosphatase concentration and back pain, vertebral bone metastasis must be considered.

**Contrast-enhanced MRI** of the spine is the imaging modality of choice for suspected vertebral metastases, even in patients without neurologic findings (e.g., bowel or bladder incontinence, weakness, or sensory loss).



**BRIEF COMMENT ON MECHANICAL,  
INFLAMMATORY, ROOT NERVE  
COMPRESSION, AND MALIGNANCY.**





# 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.

# 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.

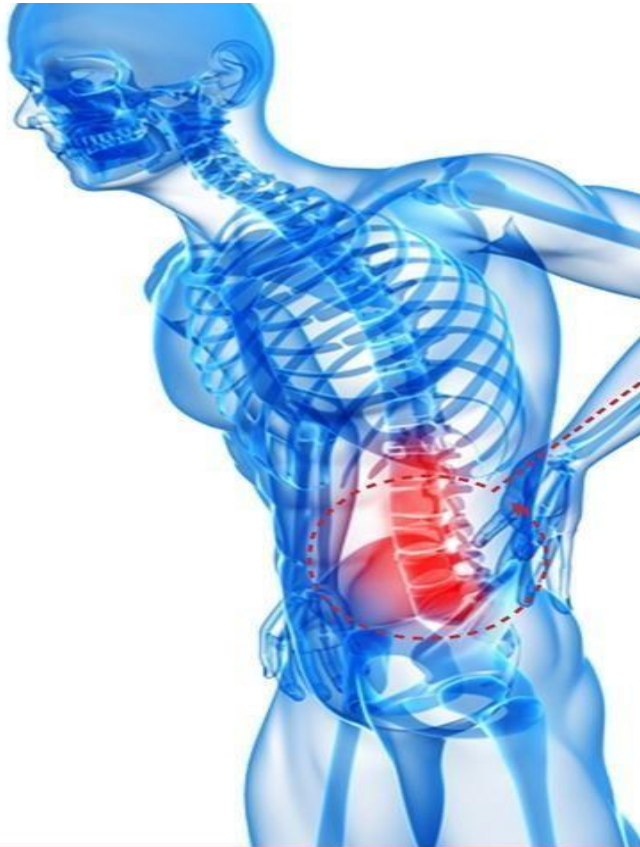
## Causes of lumbar disc herniation:

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..



## DISC HERNIA

What are the symptoms?



Leg pain is the most common symptom of a herniated disc

Pain can be mild, severe, dull, or sharp - even completely unnoticeable at all



Arm and hand weakness, but not necessarily tingling sensations

Depending on the location, a herniated disc can cause shoulder pain

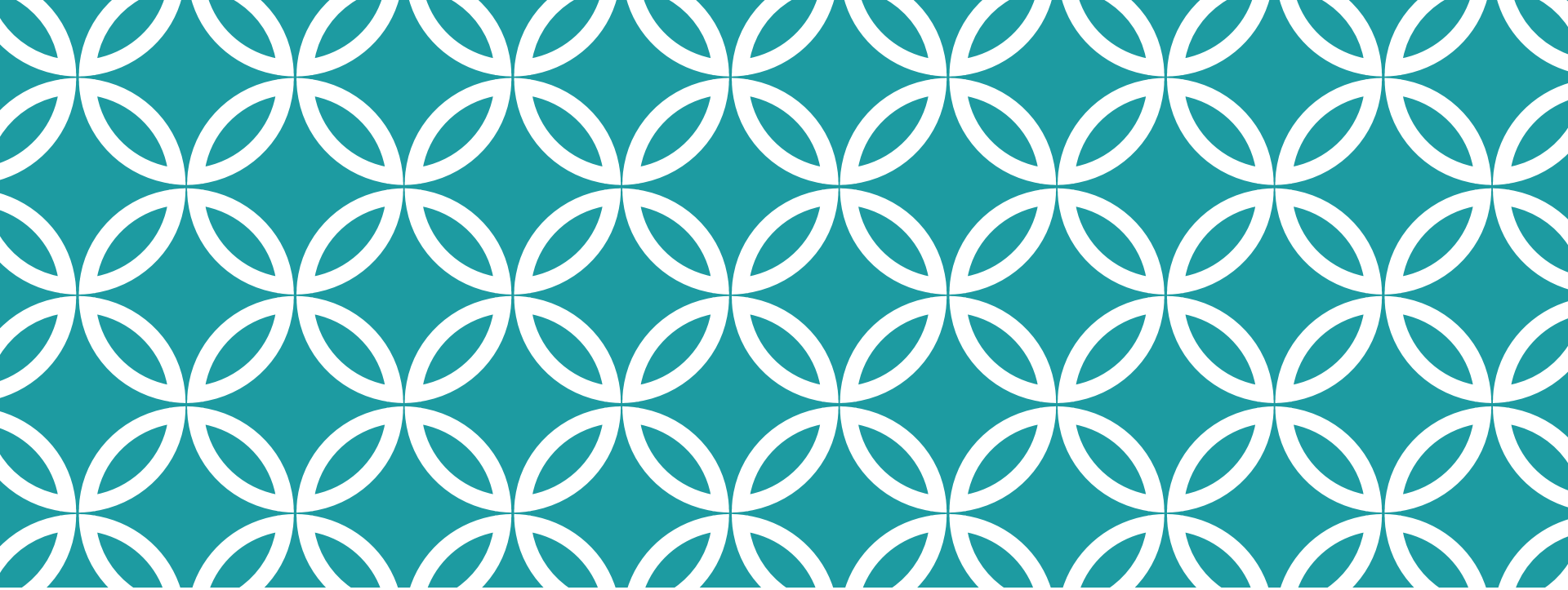


Nerve pain in the leg, commonly described as "electric"

Quick onset of pain, rather than pain appearing gradually



In extremely rare cases, loss of bladder or bowel control



# **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.

# 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?

# MANAGEMENT OPTIONS

## **A Clinical Practice Guideline From the American College of Physicians.**

2017 Apr 4

### **Recommendation 1:**

Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal muscle relaxants (moderate-quality evidence). (Grade: strong recommendation).

### **Recommendation 2:**

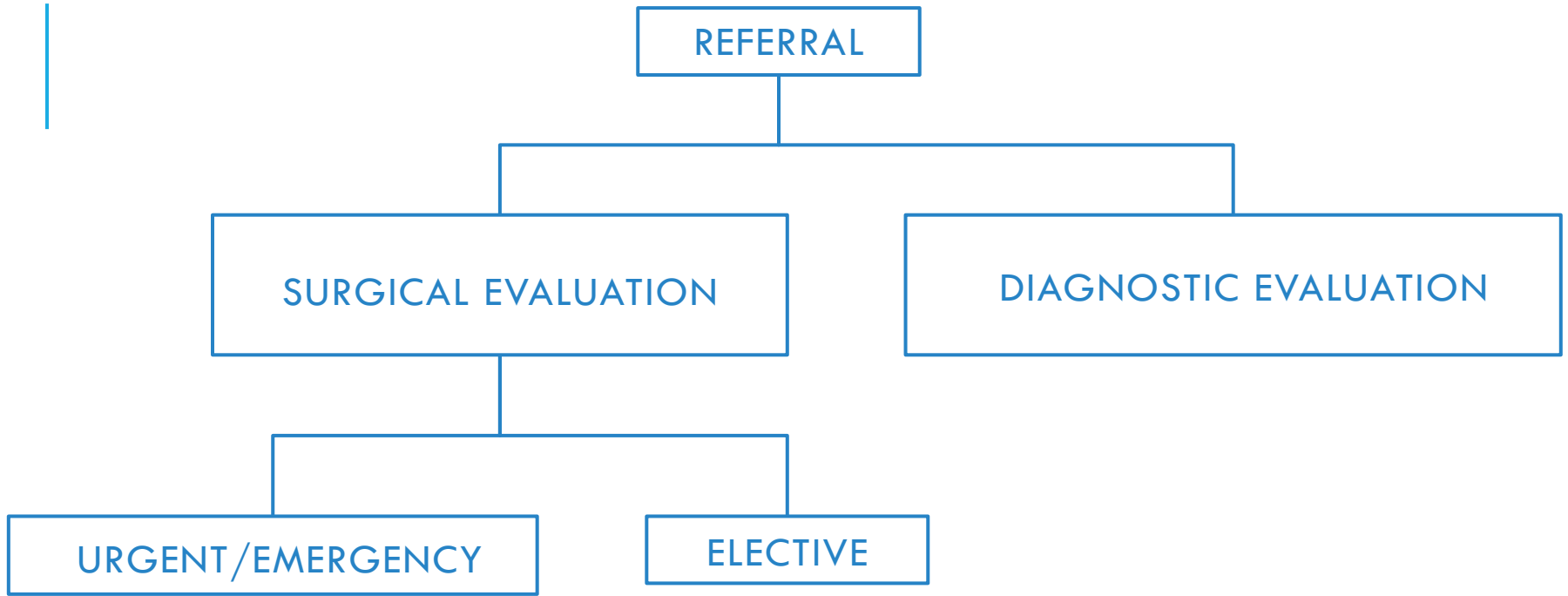
For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), tai chi, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation).

### **Recommendation 3:**

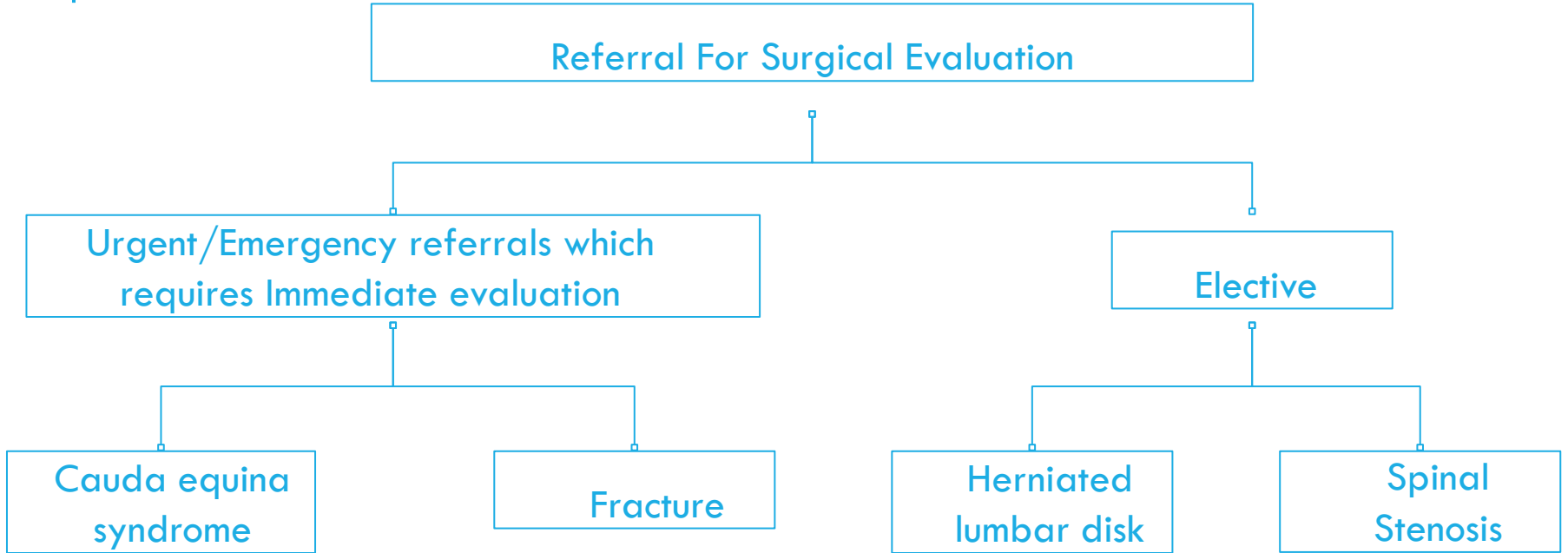
In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence).



# **WHEN TO REFER TO A SPECIALIST.**



# 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 such as :

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

# WHEN TO REFER FOR DIAGNOSTIC EVALUATION

Patients with

- Sciatica
- Abnormal nerve root findings (abnormal strength, sensation, reflex)

PHC

- Conservative therapy

Referral

- Neurologist
- Orthopedic
- Neurological surgeon



# WHEN TO REFER FOR DIAGNOSTIC EVALUATION

## Acute Lower Back Pain

PHC

- ❖ For acute lower back pain that is not improving, initial referral is usually for physical treatments.

Persistent

- ❖ Patients with persistent symptoms despite physical treatments

Referral

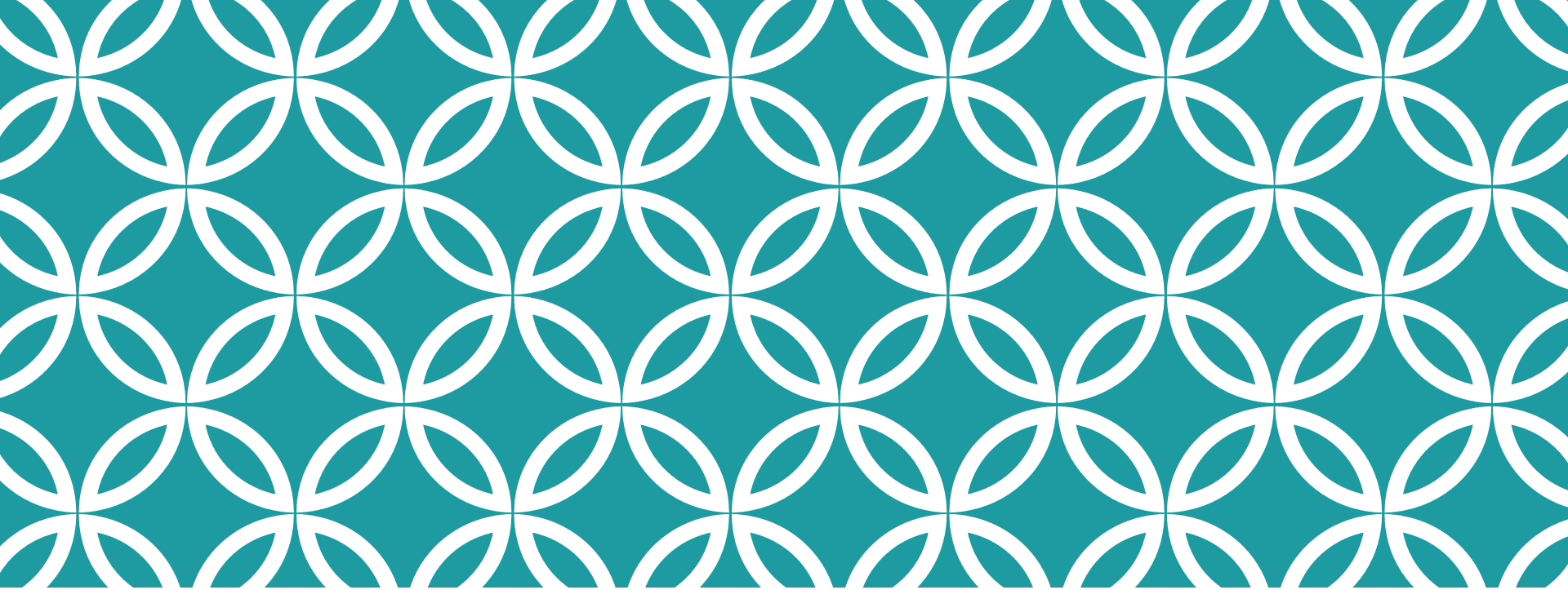
- ❖ Orthopedists
- ❖ Rheumatologists for diagnostic evaluation.

# RED FLAG SYMPTOMS OF BACK PAIN

**TUNA  
FISH**

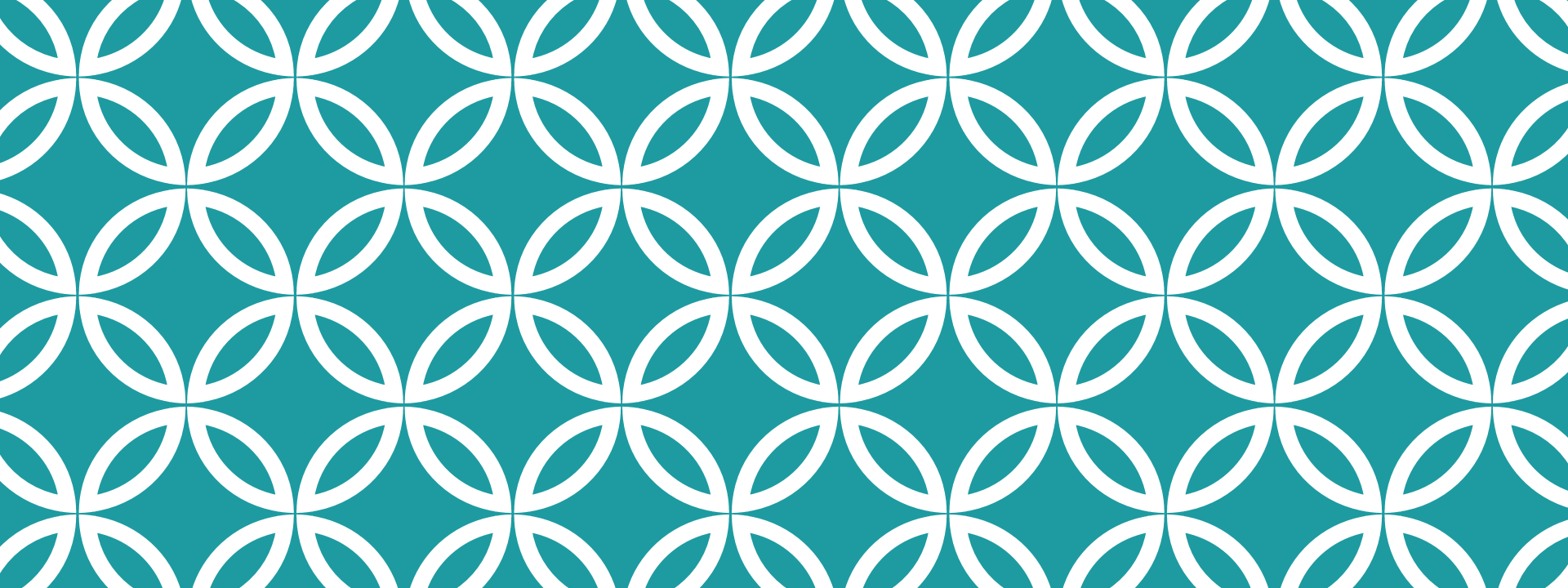
- T** TRAUMA
- U** UNEXPLAINED WEIGHT LOSS
- N** NEUROLOGIC SYMPTOMS
- A** AGE >50
- F** FEVER
- I** INTRAVENOUS DRUG USE
- S** STEROID USE
- H** HISTORY OF CANCER





**ROLE PLAY**





**PREVENTION AND EDUCATION.**



# -1 LOSING WEIGHT

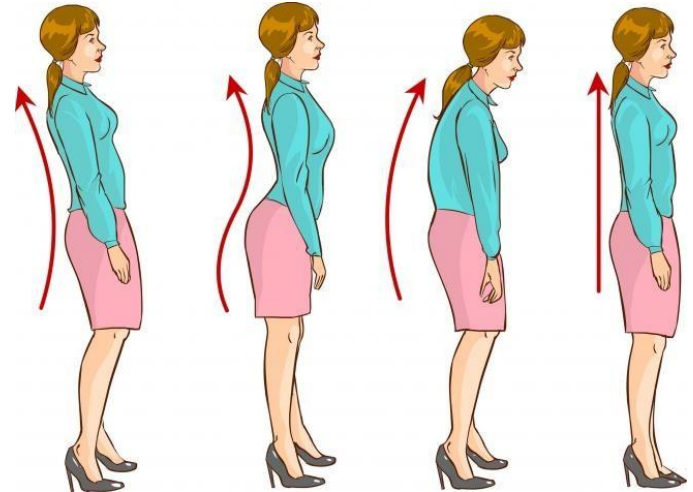
Too much upper body weight can strain the lower back.



# -2POSTURE

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:

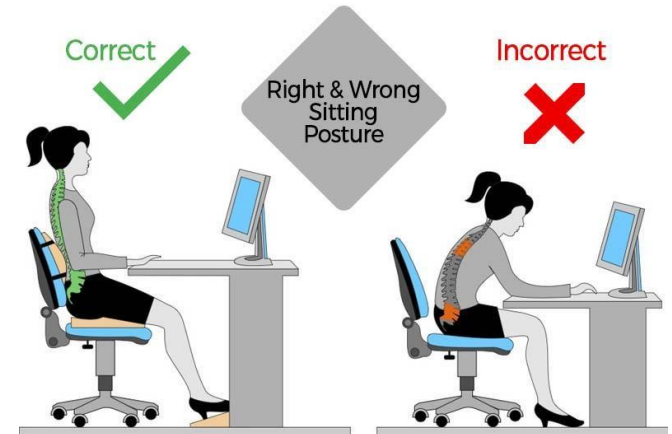
- **Standing:** Stand upright, with your head facing forward and your back straight. Balance your weight evenly on both feet and keep your legs straight.



# -2POSTURE

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:

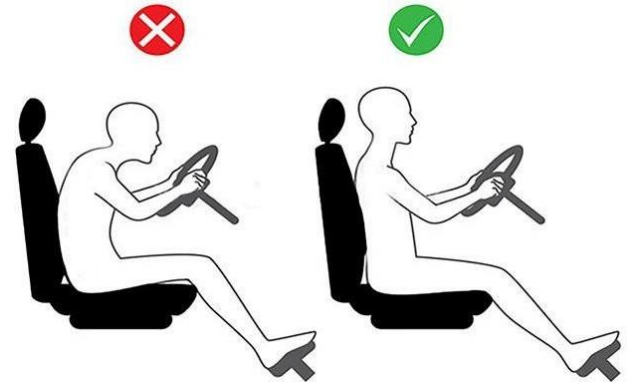
- **Sitting:** Sit up with your back straight and your shoulders back. Your knees and hips should be level and your feet should be flat on the floor.



## 2- POSTURE

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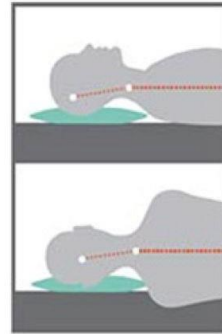
- **Driving:** Correctly positioning your wing mirrors will prevent you from having to twist around. If driving long distances, take regular breaks so that you can stretch your legs.



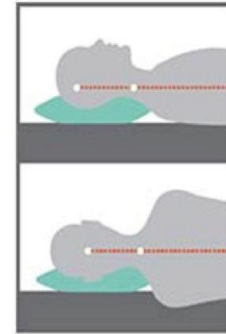


# -3SLEEPING

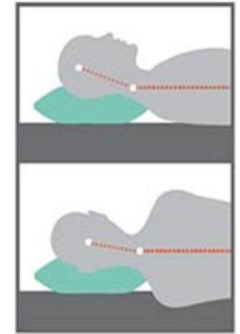
- Your mattress should be firm enough to support your body while supporting the weight of your shoulders and buttocks, keeping your spine straight.
- Support your head with a pillow, but make sure that your neck is not forced up at a steep angle.



WRONG



RIGHT

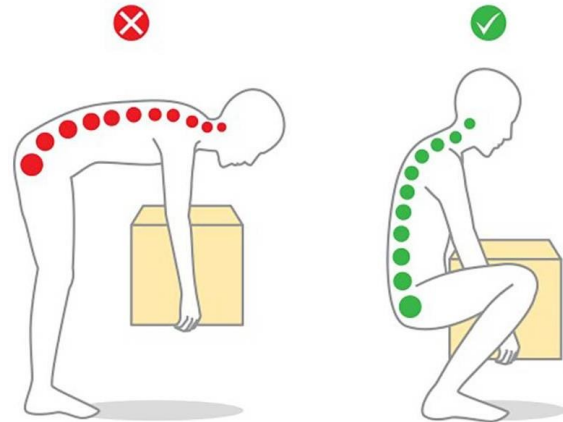


WRONG

# 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



# -5EXERCISING

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.

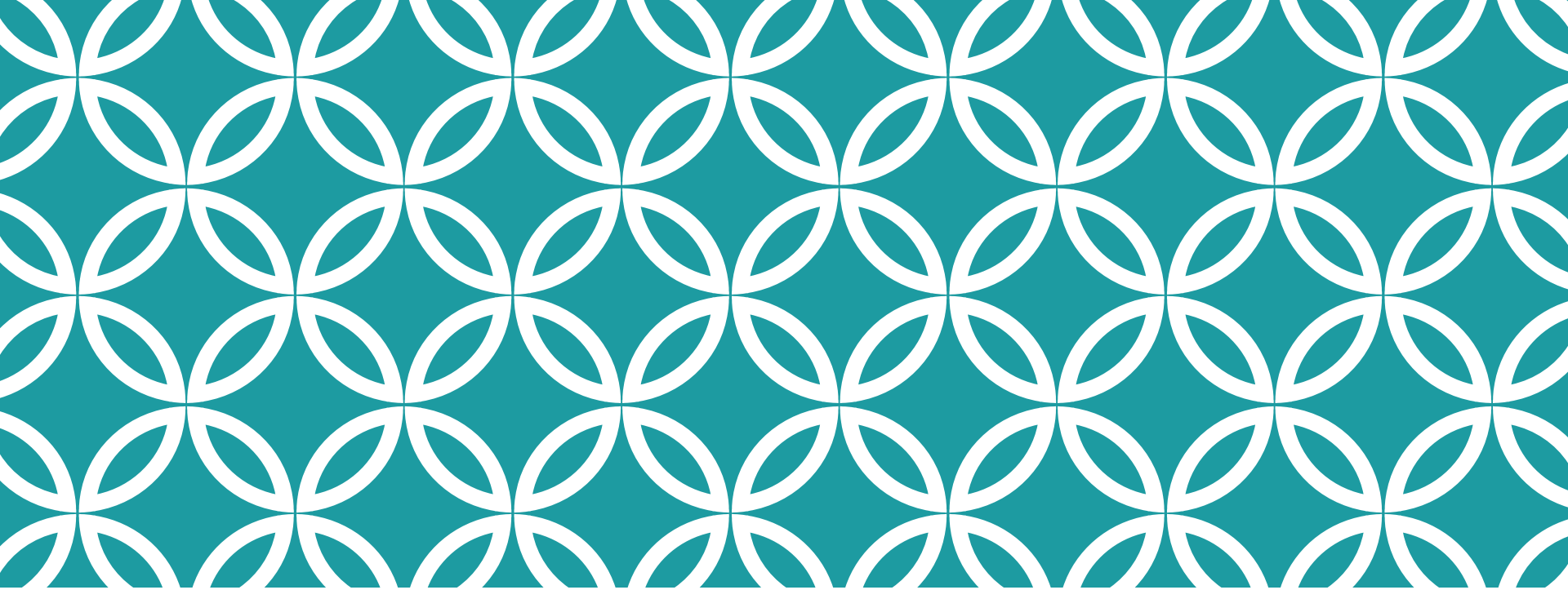
Exercises such as walking or swimming strengthen the muscles that support your back or activities such as yoga.



## -6 WEARING PROPER SHOES

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





**MCQS PLEASE VISIT :**

**[HTTPS://KAHOOT.IT](https://kahoot.it)**



# MCQS

- Which one of the following is the leading cause of sciatica?
  - A. Piriformis syndrome
  - B. Spinal stenosis
  - C. Spinal disc herniation
  - D. **Spondylolisthesis**

## MCQS

- 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

## MCQS

▪ Which one of the following is the most common site for disc herniations?

A. L5-S1

B. L4-L5

C. T1-T2

D. T10-T11



## MCQS

- Which one of the following is the most common cause for lower back pain?
  - A. Ankylosing spondylitis
  - B. Muscle strain**
  - C. Vertebral fracture
  - D. Spinal stenosis

# MCQS

- A 44 years old women came to the physician because several months history of low back pain that started gradually. Pain is worst in the morning and associated with stiffness which become better throughout the day.

Which one of the following is most likely the cause of her pain?

- A. Muscle strain
- B. Vertebral fracture
- C. Spinal disc herniation
- D. Ankylosing spondylitis

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# **Thank you!**

**Any questions?**