Approach to patient with Back pain

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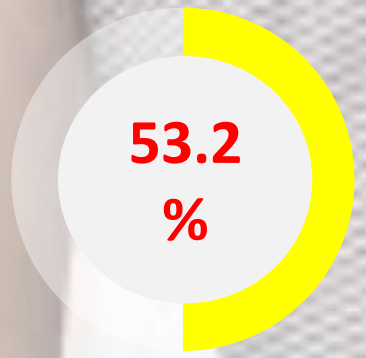
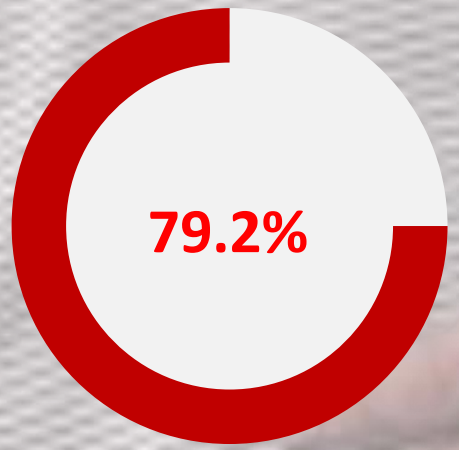
Objectives

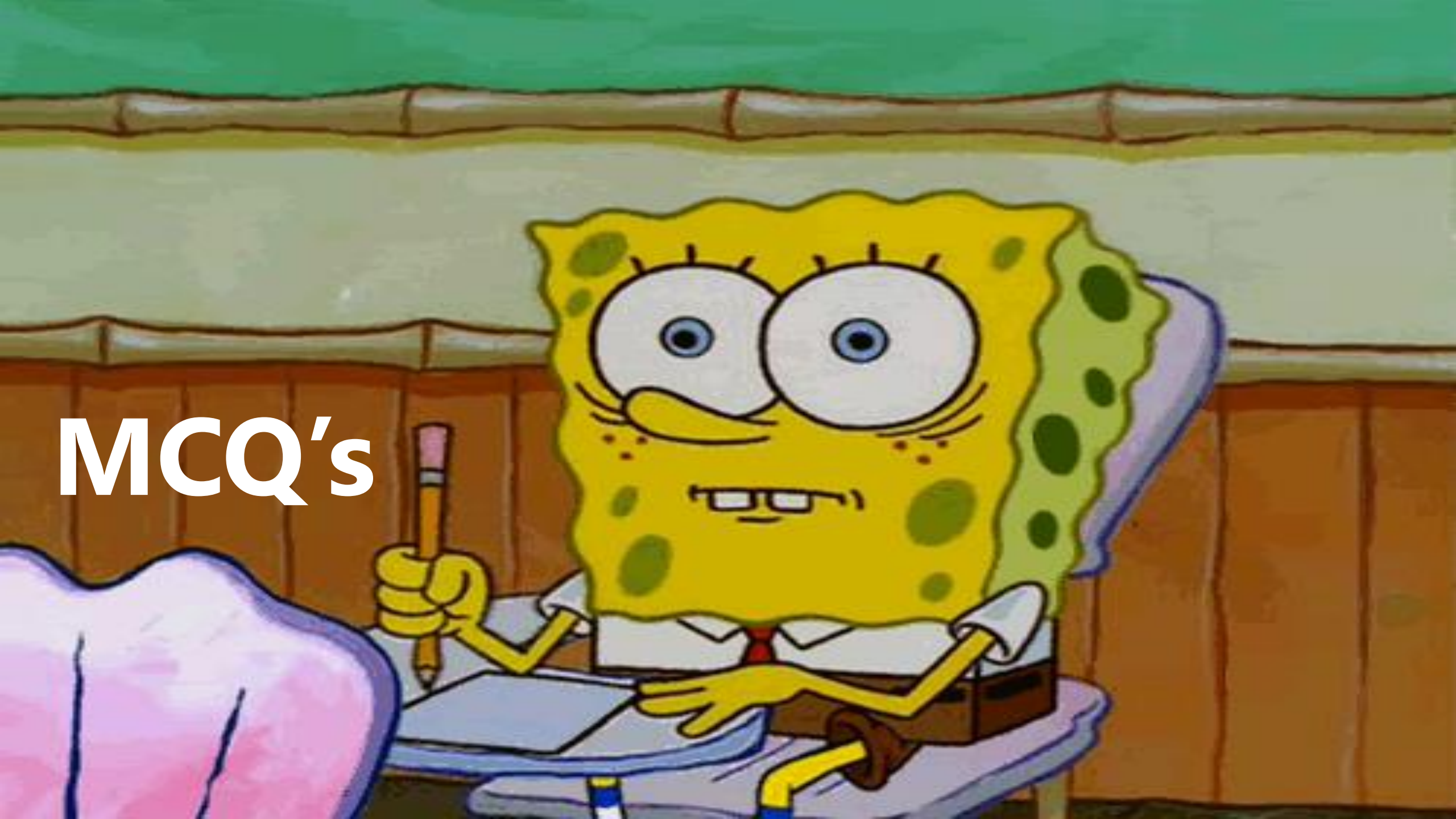
- Diagnosis including history, Red Flags, and Examination
- Brief comment on Mechanical, Inflammatory, Root nerve compression, and Malignancy.
- Common causes
- Role of primary health care in management
- When to refer to a specialist
- Prevention and Education

Back pain





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


MCQ’s

MCQ

1- Which of the following is the most common cause of Lower Back Pain ?

a. Metastatic bone disease

b. Inflammatory back pain

c. Lumbosacral sprain or strain

d. Herniation

MCQ

2- Which of the following is considered as Red flag in Lower Back Pain?

a. History of dysmenorrhea

b. Steroid use

c. Night pain

d. Age more than 40

MCQ

3- Which of the following is a feature of inflammatory process?

a. Usually acute in progression

b. Worse while exercise

c. 60 minutes of morning stiffness

d. Age more than 50

MCQ

4- Patient came to FM clinic complaining of intermittet LBP for 2 years that radiates to thigh and legs, it gets worse with prolonged standing and relived by forward flexion. No motor deficits or any other worrisome symptoms.
How would you manage this patient ?

a. Increase physical activity time

b. Bed rest

c. Analgesia (NSAIDS)

d. Refer to neurology

MCQ

5- Positive Adams Forward bending test indicates ……. ?

a.Lordosis

b. Kyphosis

c. Compression fracture

d. Scoliosis

How to approach LBP ?

History taking ?

Main types of back pain

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
- Prostatitis
- Endometriosis
- Stones
- Pyelonephritis
- Pancreatitis

HISTORY TAKING OF BACK PAIN

1-Personal History (Name - Age - Occupation)

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

- Site?
- Onset?
- Character?
- Radiation?
- Associated?
- Timing?
- Exacerbating?
- Severity?

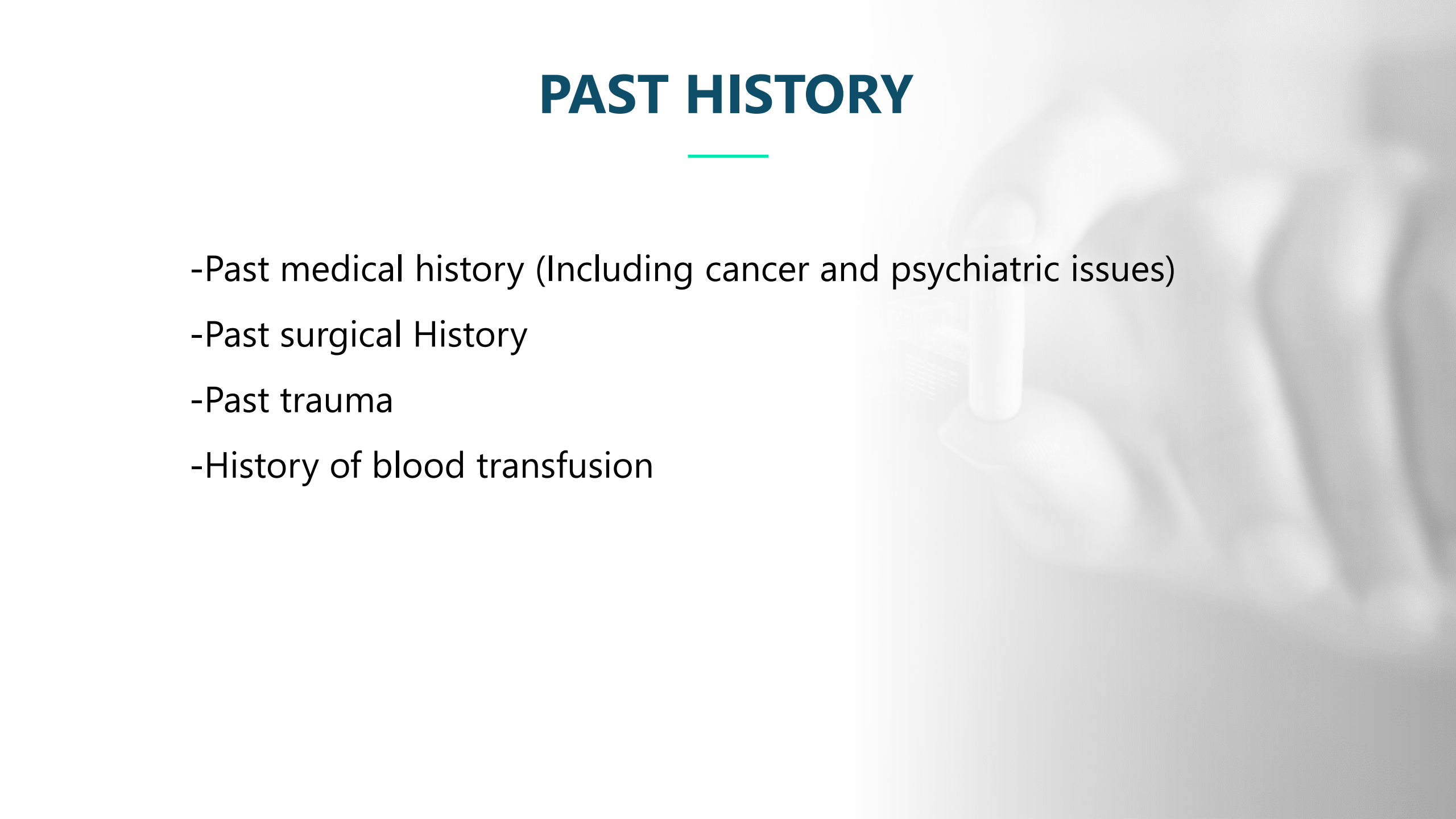
PAST HISTORY

-Past medical history (Including cancer and psychiatric issues)

-Past surgical History

-Past trauma

-History of blood transfusion



RED FLAGS & CONSTITUTIONAL SYMPTOMS

-Fever

-Weight loss

-nausea & vomiting

-Loss of appetite

-Night sweat

-Urinary retention or incontinence

-Fecal incontinence or urgency

-Impotence

FAMILY HISTORY

-Of similar condition

-Any inherited diseases that run in the family.

-History of Cancer

MEDICATIONS HISTORY

-INCLUDING ALLERGY OR STEROIDS

SOCIAL HISTORY

-Smoking

-Alcohol

-Illicit drug usage

-Recent Travel

-Contact with infected people

-Immunization history

Don’t forget ICE

IDEAS Concerns Expectations

How does it affect the patient functionally and mentally?

What is our next step?

Physical examination

Physical examination has 4 parts

- inspection
- palpation
- Movements
- Special tests

Inspection

Inspection:

Expose the trunk and lower limbs properly.

Examine front and back.

Alignment, Deformity (Kyphosis, Scoliosis, Hyperlordosis…), Muscle wasting, skin changes, swelling, scars, Hairy tuft, “cafe au lait” spots.

Are shoulders and pelvis level symmetrical?

Gait:

Abnormal gait types: Antalgic, Trendelenburg, Waddling.

Heel and toe walking: For nerve roots.

Heel walk = Examining L4.

Toe walk = Examining S1.

Palpation

- Palpate spinous processes for tenderness, steps or gaps. (Check for the spinous processes alignment if it is central).

- Soft tissues: Temperature, tenderness

Movement

Start with Active ROM in all 6-directions:

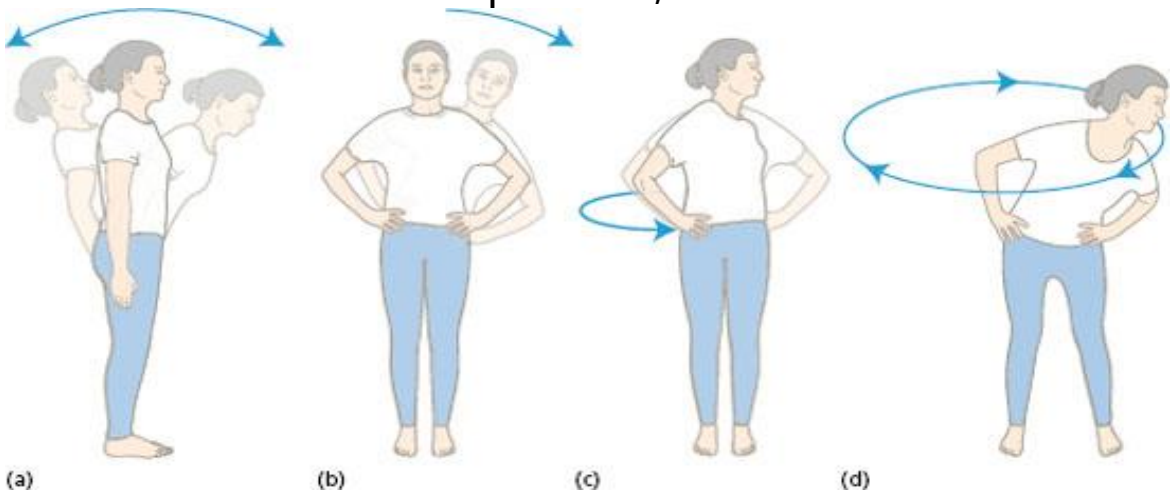
Flexion: Record as such (able to touch toes/shins/knee/thighs…) (Make sure the leg is straight/ knee extended)

Extension: Normal around 30°.

Lateral bending: Normal around 30°.

Rotation: Normal around 40°. (When assessing rotation, it's mandatory to put your hands on each side of the patient's pelvis !!)

Note if Painful/Painless. Attempt passive ROM if Active is limited and painless, record.



Special tests

Adams forward bending test:
(The examiner stands behind the patient to assess)

Full forward flexion until back is horizontal to the floor. (with complete knee extension and hands in the air not touching the knee).

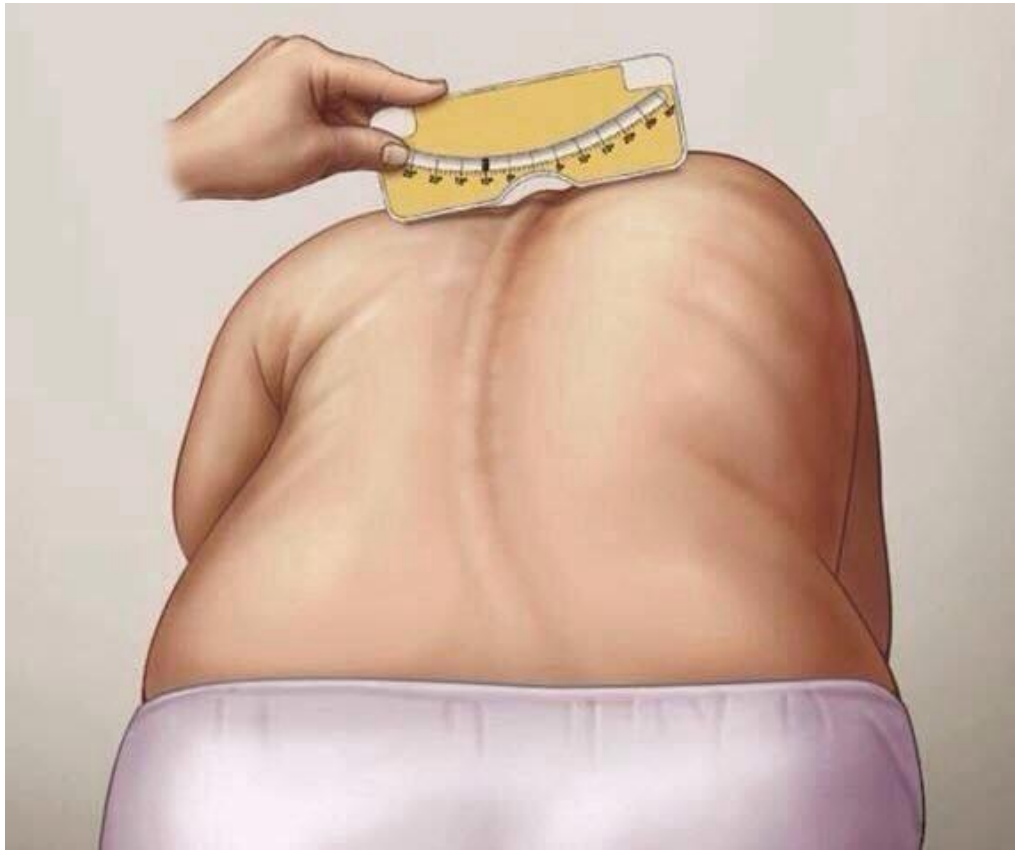
If thoracic Scoliosis is present, then rib hump will become visible

Straight raise leg test:
With the patient supine, passively elevate the leg, the examiner's hand behind the heel-with knee extended while observing the patient's face for any signs of discomfort.

A positive test is reproduction of sciatica (Sharp shooting pain radiating below knees- between 30° and 70° of hip flexion.

The pain is aggravated with ankle dorsiflexion and relieved with knee flexion

Special tests



Adams Forward bending Test
https://www.youtube.com/watch?v=JmvGHszR_X4

Straight leg raise test
https://www.youtube.com/watch?v=1EPii3Pz6V0

Neurological examination

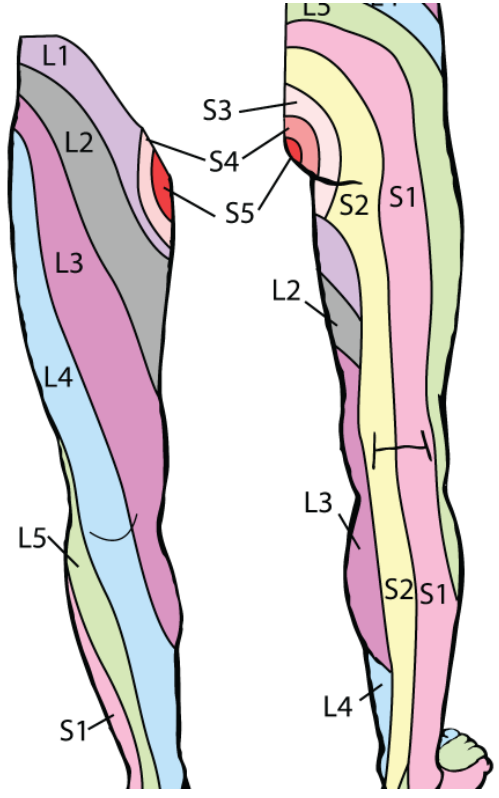
1.Motor:

- Hip flexion=L2
- Knee extension=L3
- Ankle dorsiflexion=L4
- EHL (great toe extension-Extensor Hallucis Longus)=L5
- Ankle plantar flexion=S1

2.Sensory: Dermatomes.

3.Tone: Normal, Flaccid or rigid.

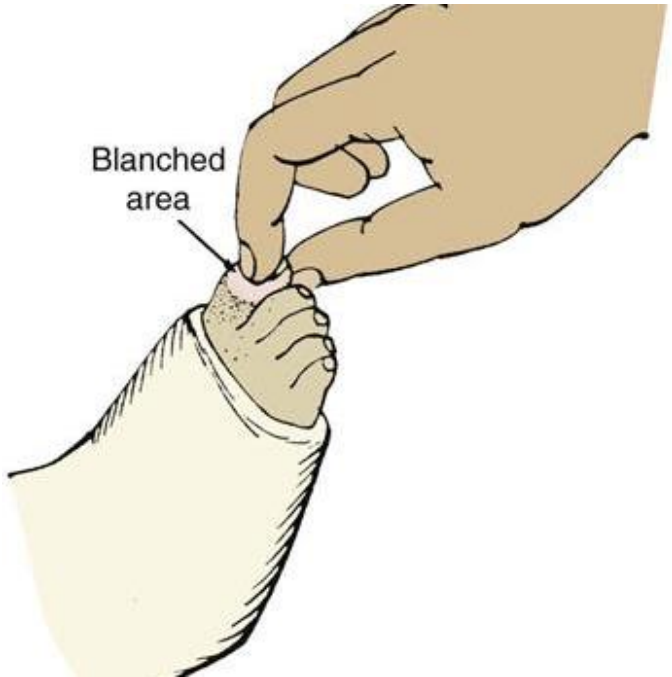
4.Reflexes: Knee & ankle jerks.



pulses

Pedal pulses: Dorsalis Pedis , posterior Tibial arteries

Capillary refill time: Normal < 2 seconds



After completing History and Physical examination we move to our next step .....

investigations

What are the available investigations

- **X-ray.** These images show the alignment of your bones and whether you have arthritis or broken bones. These images alone won't show problems with your spinal cord, muscles, nerves or disks.
- **MRI or CT scans.** These scans generate images that can reveal herniated disks or problems with bones, muscles, tissue, tendons, nerves, ligaments and blood vessels.
- **Blood tests.** These can help determine whether you have an infection or other condition that might be causing your pain.
- **Bone scan.** In rare cases, your doctor might use a bone scan to look for bone tumors or compression fractures caused by osteoporosis.
- **Nerve studies.** Electromyography (EMG) measures the electrical impulses produced by the nerves and the responses of your muscles. This test can confirm nerve compression caused by herniated disks or narrowing of your spinal canal (spinal stenosis).

Laboratory investigations

- FBC – suspected infection, malignancy, non-spinal cause of back pain.
- ESR – suspected infection, malignancy, ankylosing spondylitis.
- Bloods cultures – febrile and suspected infection.
- Coagulation studies – neurosurgery anticipated.
- Other pathology tests including UECs, LFTs, lipase, urinalysis etc. should be considered when suspecting a non-spinal cause of back pain.

Indications of different modalities

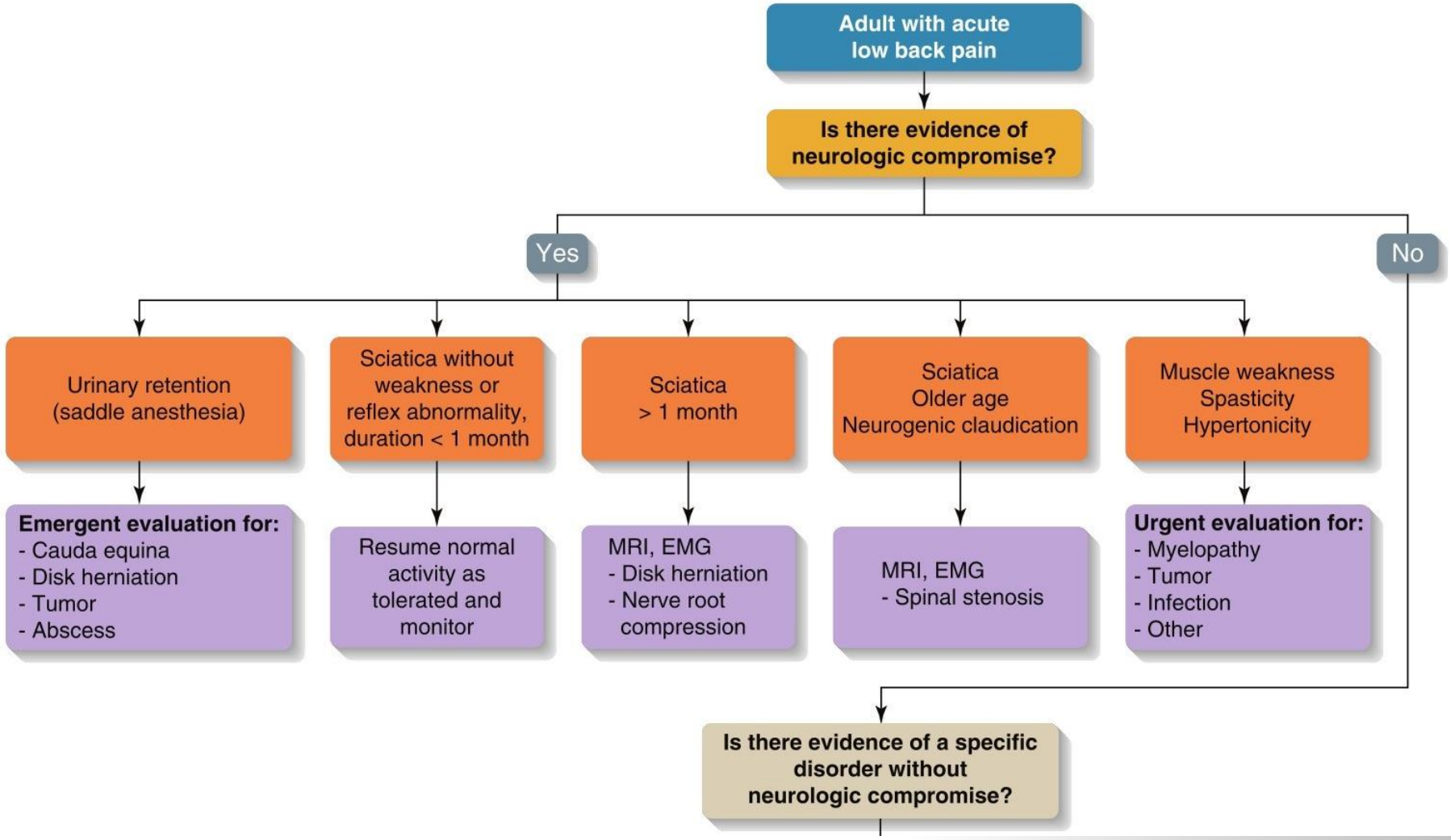
MRI:

- Major risk factors for cancer
- signs of cauda equina syndrome(Urinary retention, faecal incontinence, saddle anaesthesia.)
- Risk factors for spinal infection
- Severe neurological deficits
- Progressive motor weakness, motor deficits at multiple neurological levels.

- **CT:**
- If an MRI is contra-indicated or unavailable and the above diagnoses are suspected a CT lumbar spine may be indicated after discussion with a neurosurgeon and radiologist.
- Vertebral fracture suspected with significant trauma.

X-RAY

- Vertebral fracture suspected in:
  Osteoporotic bone (elderly, corticosteroid use) with minimal or no trauma


Adult with acute low back pain
Is there evidence of neurologic compromise?
Yes
No
Urinary retention (saddle anesthesia)
Sciatica without weakness or reflex abnormality, duration < 1 month
Sciatica > 1 month
Sciatica Older age Neurogenic claudication
Muscle weakness Spasticity Hypertonicity
Emergent evaluation for:
- Cauda equina
- Disk herniation
- Tumor
- Abscess
Resume normal activity as tolerated and monitor
MRI, EMG
- Disk herniation
- Nerve root compression
MRI, EMG
- Spinal stenosis
Urgent evaluation for:
- Myelopathy
- Tumor
- Infection
- Other
Is there evidence of a specific disorder without neurologic compromise?

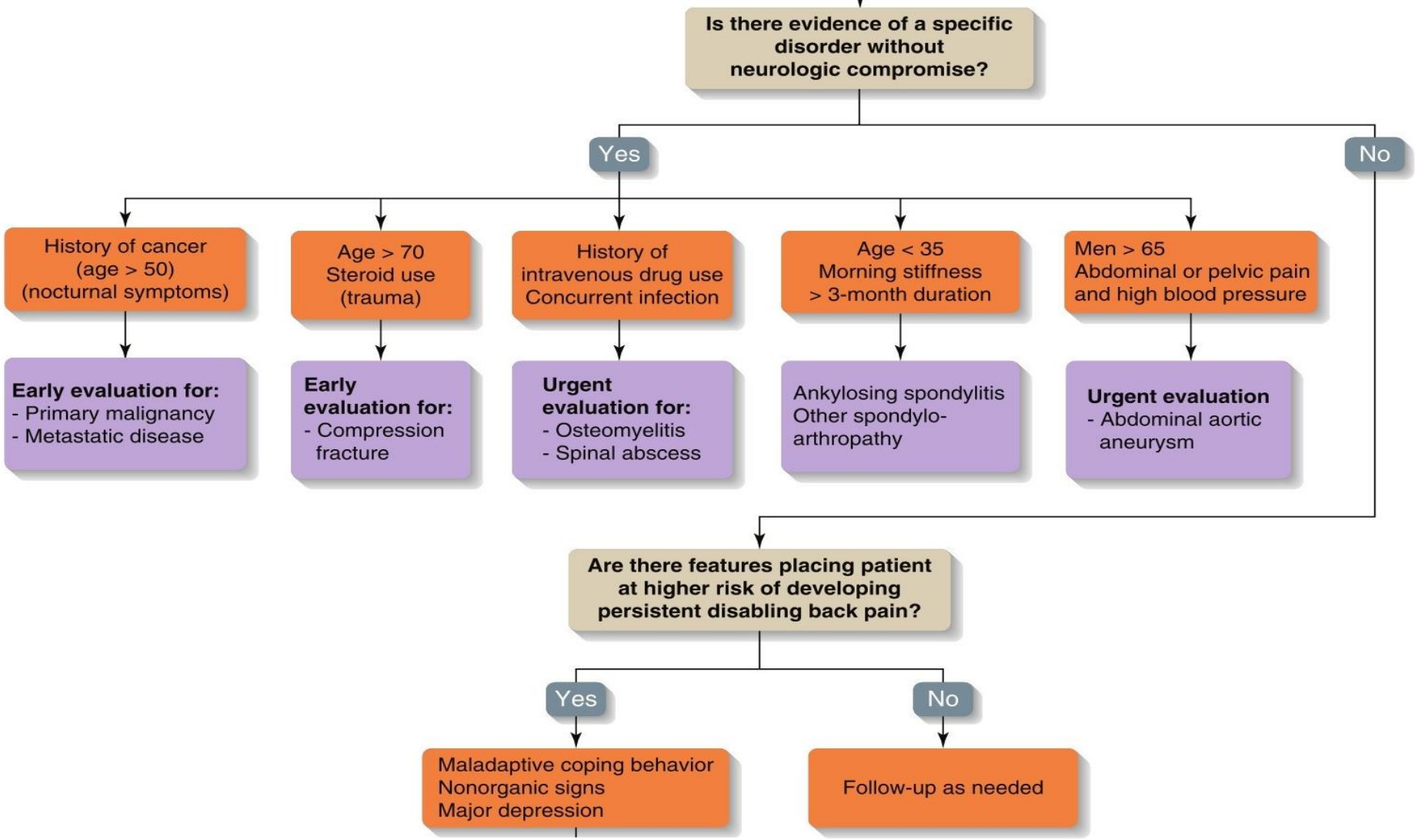


FIGURE 54–1 Diagnostic approach: Low back pain. EMG, electromyography; MRI, magnetic resonance imaging.

Cases

A 50-year-old man comes to the emergency department because of urinary incontinence for the past 5 hours. His past medical history is noncontributory. He says the onset was sudden and accompanied by worsening back pain. He now cannot feel anything as he wipes after voiding his bowel or bladder. He also feels "pins and needles," along both medial thighs. Which of the following is the most likely diagnosis?

A.cauda equina
B.conus medullaris
c.lumbar disc herniation

ANSWER:A

What is the best investigation to confirm the diagnosis?

A.CT
B.MRI
C.X-RAY

ANSWER:B

Role play

Brief comment on:

- Mechanical.
- inflammatory.
- Malignancy
- root nerve compression. .

Mechanical pain Sx

1- better or worse depending on position

2-worse during activity and movement

3-can be sudden or gradual

4-poor posture or lifting something heavy with bad posture

5-minor injury

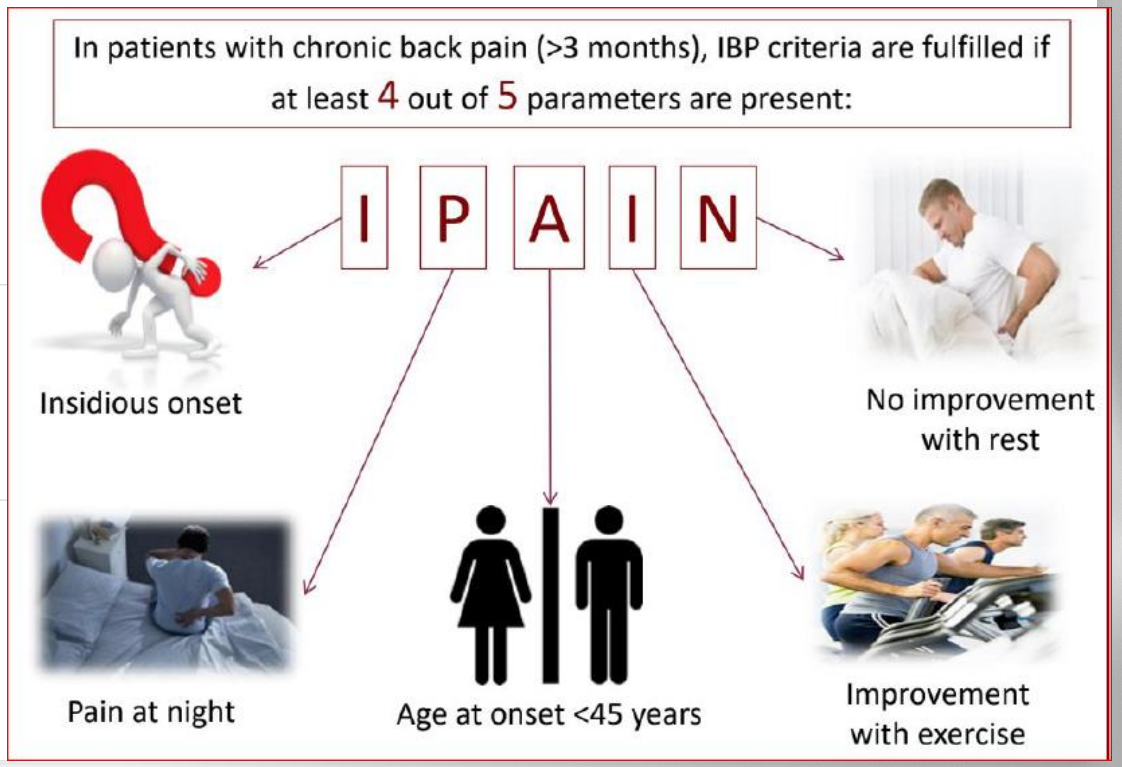
Mechanical pain DDx

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

Inflammatory pain Sx

"I'm pain"

1. Back pain >3months
2. Early morning pain &
Stiffness.
4. Tenderness over the joint



Inflammatory pain DDx

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

Malignancy pain Sx

1. History of malignancy is important (male/female).
2. Patient presents with pain at night and rest, fever, weight loss, loss of appetite and N/V.
3. Neurological deficits if the tumor destruction is extensive or causing compression.

Malignancy pain DDx

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

Nerve root Compression Sx

- 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.

Nerve root innervation

Nerve root	Motor deficit	Reflex affected	Sensory area affected
L4	Dorsiflexion of the foot	Knee jerk	Inner calf
L5	Dorsiflexion of the toe	None	Inner forefoot
S1	Eversion of foot	Ankle jerk	Outer foot

Nerve root compression DDx

Causes

1. Trauma /injury to the disc
2. Degeneration
3. Congenital

Risk factors

1. Age
2. Smoking
3. Obesity
4. Trauma
5. Work

Common causes of back pain

Case scenario

A 51-year-old woman presents to your clinic with a complaint of low back pain, which began acutely 2 weeks earlier, 1 day after a 10-km run. The pain is described as achy, intermittent, and located in the central region of her low back. It is associated with an occasional electrical sensation shooting down her left leg. The pain is aggravated by rolling over in bed, prolonged sitting, and running; it is relieved by rest, changing positions, and ibuprofen

Lumbar muscle strain/sprain

Clinical presentation, Risk factors, Investigations and Management

- **The most common source of back pain**

- **Clinical presentation**

-Sharp intense pain for 1 to 2 days; muscle spasm; most patients recover within 3 months
-Stiffness, and/or soreness of the lumbosacral region (underneath the twelfth rib and above the gluteal folds) persisting for <12 weeks.

- **Risk factors**

1. Lifting a heavy object, or twisting the spine while lifting
2. Sudden movements that place too much stress on the low back, such as a fall
3. Poor posture over time
4. Sports injuries, especially in sports that involve twisting or large forces of impact

❖ **What is the difference between strain and sprain?**

Clinical presentation, Risk factors, Investigations Management

- **Investigations:**

<4 Weeks ..... Clinical diagnosis

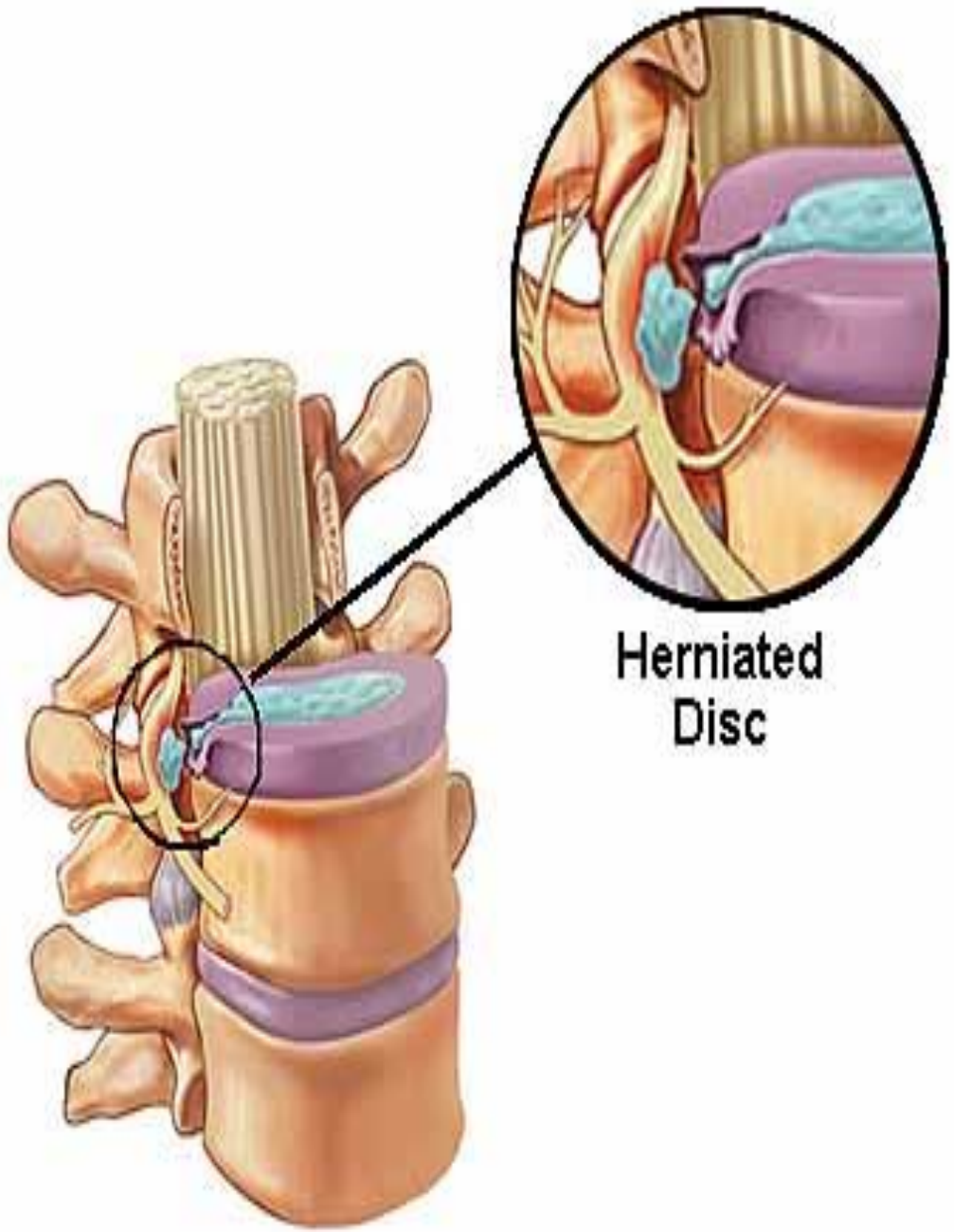
>6 Weeks .... Lumbar Spine X-Ray, MRI, CT and Labs.

- **Management:**

Acute (< 4 Weeks)	Subacute (4-12 Weeks)	Chronic (> 12 Week)
1st Line: Patient Education + Normal Activity.	**1st Line: Patient Education + Normal Activity.**	**1st Line: CBT**
+: Self care temp. treatment Heat ,Ice	**Adjunctive: Active physiotherapy and exercise therapy.**	**Adjunctive: Rehabilitation/TCA/Opioid/ Surgery.**
Adjunctive: Analgesics/Muscle relaxant.		

Case scenario

A 45-year-old man without significant past medical history presents with severe back pain after lifting boxes at work two days ago. Other than his back pain his review of symptoms is negative, the pain radiates from his lower back down his posterior thigh to his great toe, when you perform both a straight leg raise test and a contralateral leg raise are positives. His strength sensation, and reflexes are preserved



Herniated nucleus pulposus (herniated disc)

Clinical presentation, Risk factors, Investigations Management

- **Clinical presentation:**

-Low back pain with or without the concurrence of radicular lower limb symptoms in the presence of radiologically-confirmed degenerative disc disease.

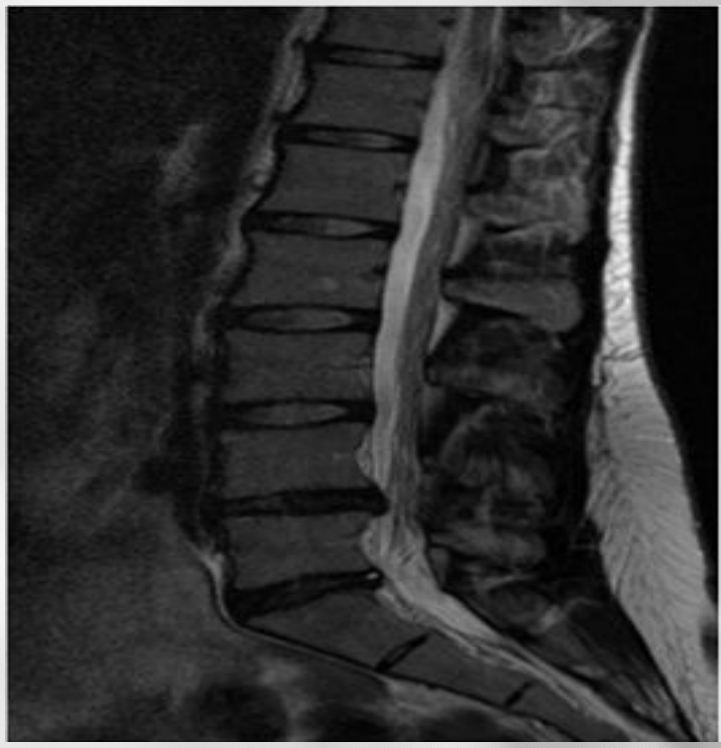
-The pain is exacerbated by activity, but may be present in certain positions, such as sitting.

-It is associated with radiating lower extremity pain in a dermatomal distribution

-History of bowel or bladder dysfunction, bilateral sciatica, and saddle anesthesia may be symptoms of **severe** compression of the cauda equine.

-Positive straight-leg raise or contralateral straight leg (reproduced below 60° of hip flexion); positive femoral stretch test may suggest upper lumbar disc herniation.

Clinical presentation, Risk factors, Investigations Management



- **Investigations**:

MRI: herniated disc

- **Management**:

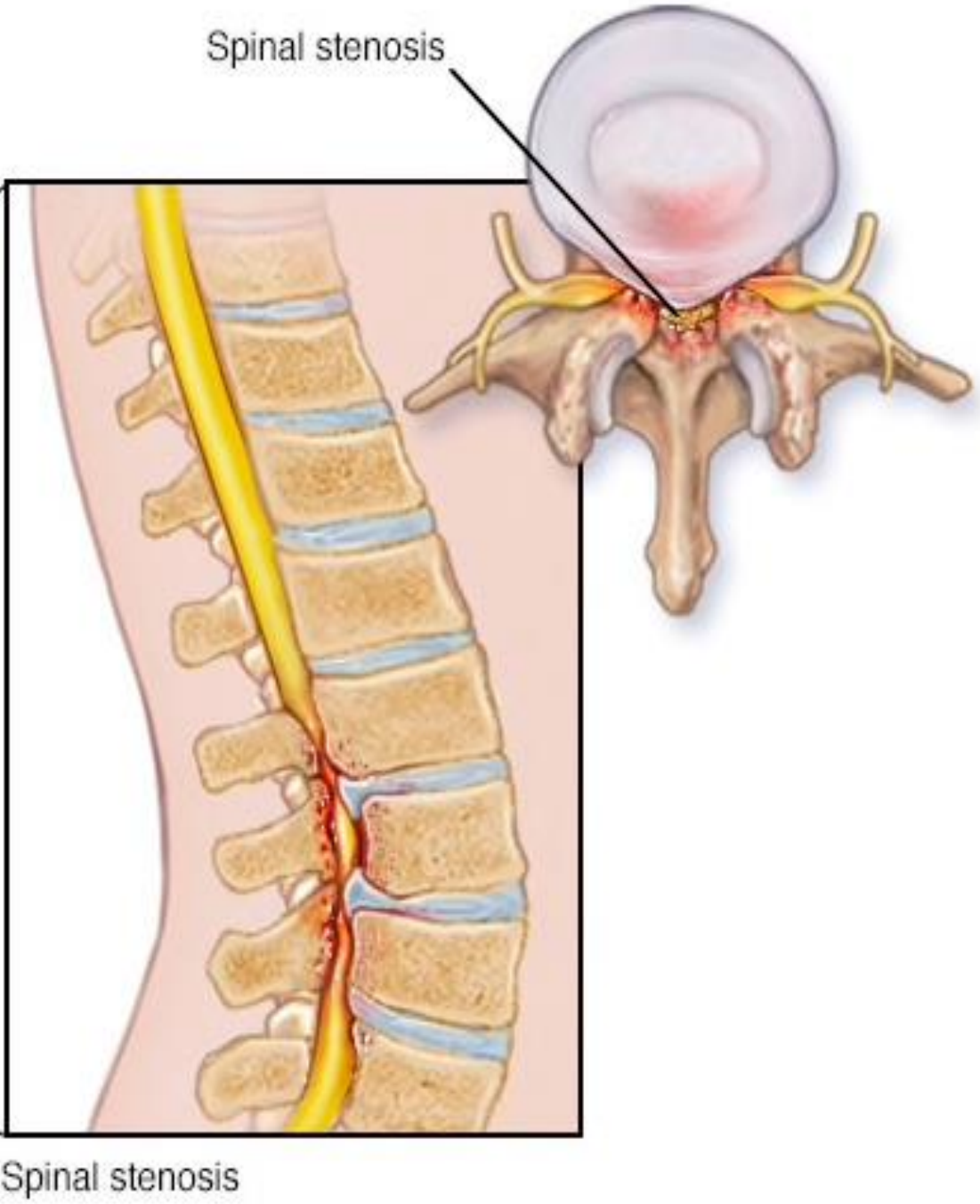
Saddle anesthesia, sphincter dysfunction, bladder retention, and leg weakness = Cauda Equina Syndrome (CES)
Urgent referral to the hospital with emergency decompression of the spinal canal within 48 hours after the onset of symptoms

< 3 Months	> 3 Months
1st Line: Paracetamol	1st Line: Continue pain management
Adjunctive: Topical analgesics/Opioid/Muscle Relaxant	Refer to pain clinic. If with Axial back pain: +Physiotherapy.

Case scenario

A 63-year-old woman presents with low back pain and cramping in both posterior thighs and numb- ness radiating into the feet with ambulation. It worsens with standing and walking and improves with sit- ting and bending forward. She has no bowel or bladder complaints.

On examination, she has full strength, normal sensation, reflexes are symmetric, and she has 2+ peripheral pulses. Straight leg raise is negative.



Spinal stenosis

Clinical presentation, Risk factors, Investigations Management

Clinical presentation: symptoms result from neural compression of the cauda equina, exiting nerve roots, or both.

Intermittent pain radiating to the thigh or legs, **Worse with prolonged standing**, activity, or lumbar extension.

Pain is typically **relieved by sitting, lying down**, and/or lumbar flexion; patient may describe intermittent burning, numbness, heaviness, or weakness in their legs, unilateral or bilateral radicular pain, motor deficits, bowel and bladder dysfunction, and back and buttock pain with standing and ambulation.

Patients walk with a forward flexed gait; patients with vascular claudication have diminished pulses and typical skin changes, such as mottled discoloration, thinning and shiny skin

Clinical presentation, Risk factors, Investigations Management

- **Investigations: MRI**

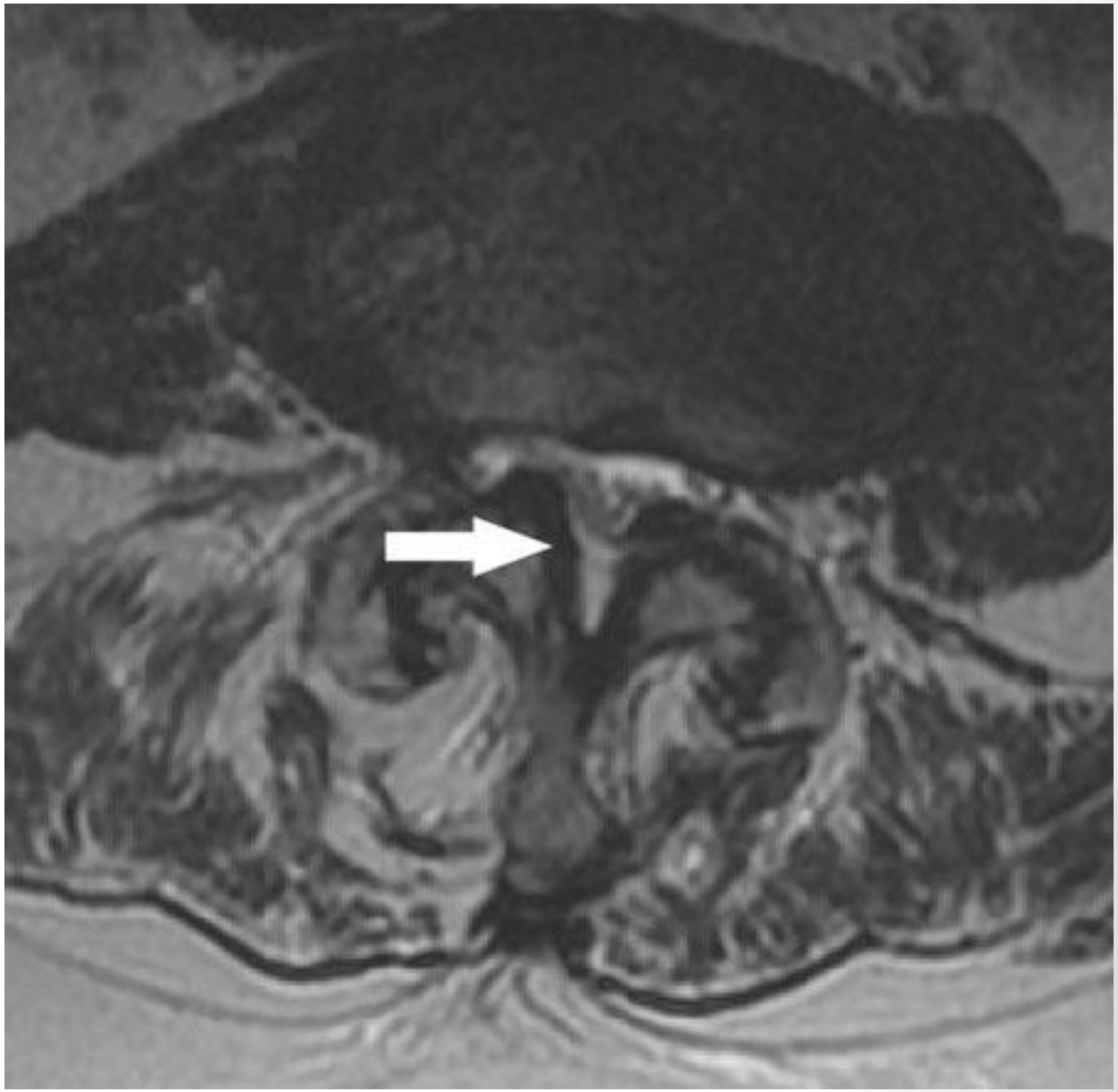
- **Management:**

significant acute neurological deficit	No significant acute neurological deficit: pain affecting quality of life and/or functional activities	Chronic symptoms
1st Line: surgical decompression	1st Line: analgesics (NSAIDs)	1st analgesics
	Adjunct: non-pharmaceutical measures*/Oral corticosteroids	Adjunct: Non-pharmaceutical measures* / Chronic pain agents / Surgery
	2nd Line: epidural corticosteroid injection	

**Non-Pharmaceutical measures:

-Temporary reduction in physical activity is recommended; patients should be careful to avoid bending, lifting, or twisting movements until the pain subsides.

-Bed rest is **not recommended**. Prolonged bed rest (>4 days) is contra-indicated, especially in older patients as it may lead to rapid de-conditioning and increased risk of DVT.



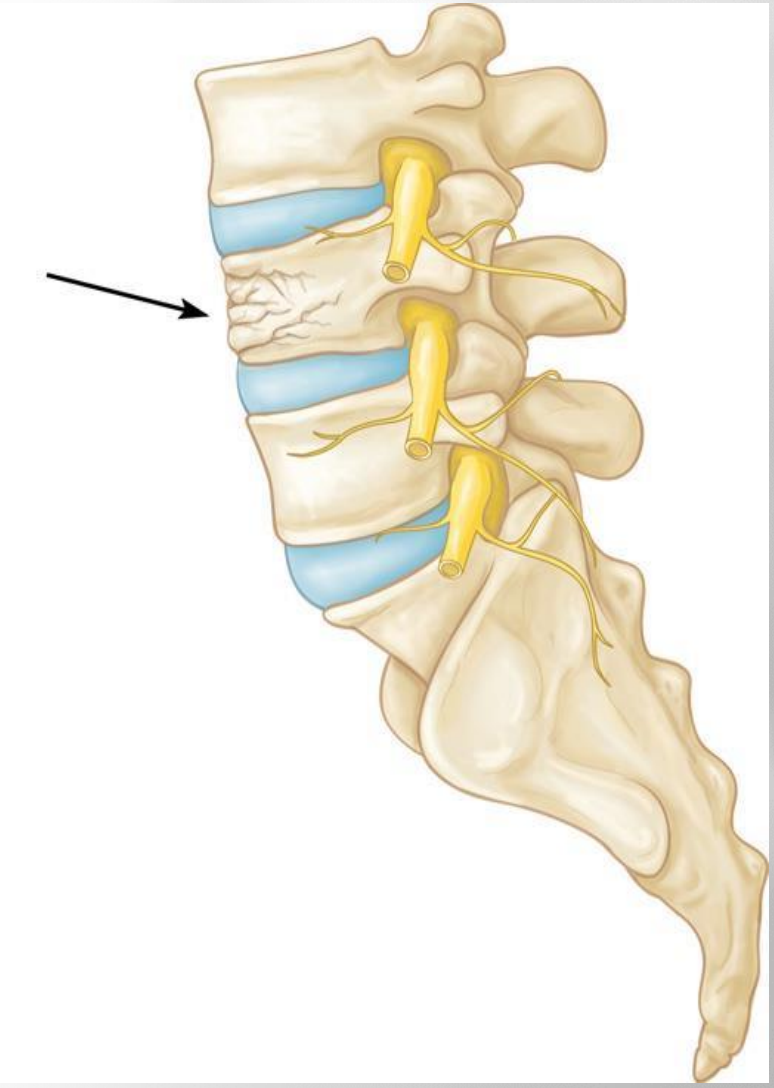
A 72-year-old male smoker with chronic obstructive pulmonary disease presents to your clinic with severe low back pain. The pain began acutely yesterday after moving furniture in his living room. It is located in the central aspect of the upper lumbar spine and is described as sharp and intermittent. It is aggravated by walking, standing, and moving from a sitting to a standing position. It is relieved with rest. He used the clinic wheelchair to come to your office because the pain is limiting ambulation. On examination, he is a thin male having sharp bursts of pain with movement, although he is comfortable while sitting still between these episodes. He has severe tenderness to palpation over the L1 spinal process with milder pain to palpation over the paraspinous muscles.

What is your leading diagnosis?

Vertebral Compression fracture

- Most osteoporotic spinal compression fractures represent an isolated failure of the **anterior spinal column** due to a combination of flexion and axial compression loading.

- The stability of the spine is not compromised with this type of fracture. **These fractures are traditionally considered benign injuries that heal without complications.**



Vertebral Compression fracture

Epidemiology incidence:

- vertebral compression fractures (VCF) are the most common fragility fracture
- 700,000 VCF per year in US
- 70,000 hospitalizations annually
- 15 billion in annual costs

Demographics:

affects up to:

- 25% people over 70 years
- 50% people over 80 years

Continue..

Risk factors:

1. Previous history of 2 compression fractures the strongest predictor.
2. Osteoporosis.
3. Age.
4. Trauma.
5. Female

Symptoms and signs of compression fracture

Symptoms:

- Pain usually at area of fracture,25% of patients with VCF seek medical attention due to pain.
- From the kyphosis can affect the pulmonary condition.

Signs:

- focal tenderness
- Local kyphosis
- Spinal cord injury
- Nerve root deficits

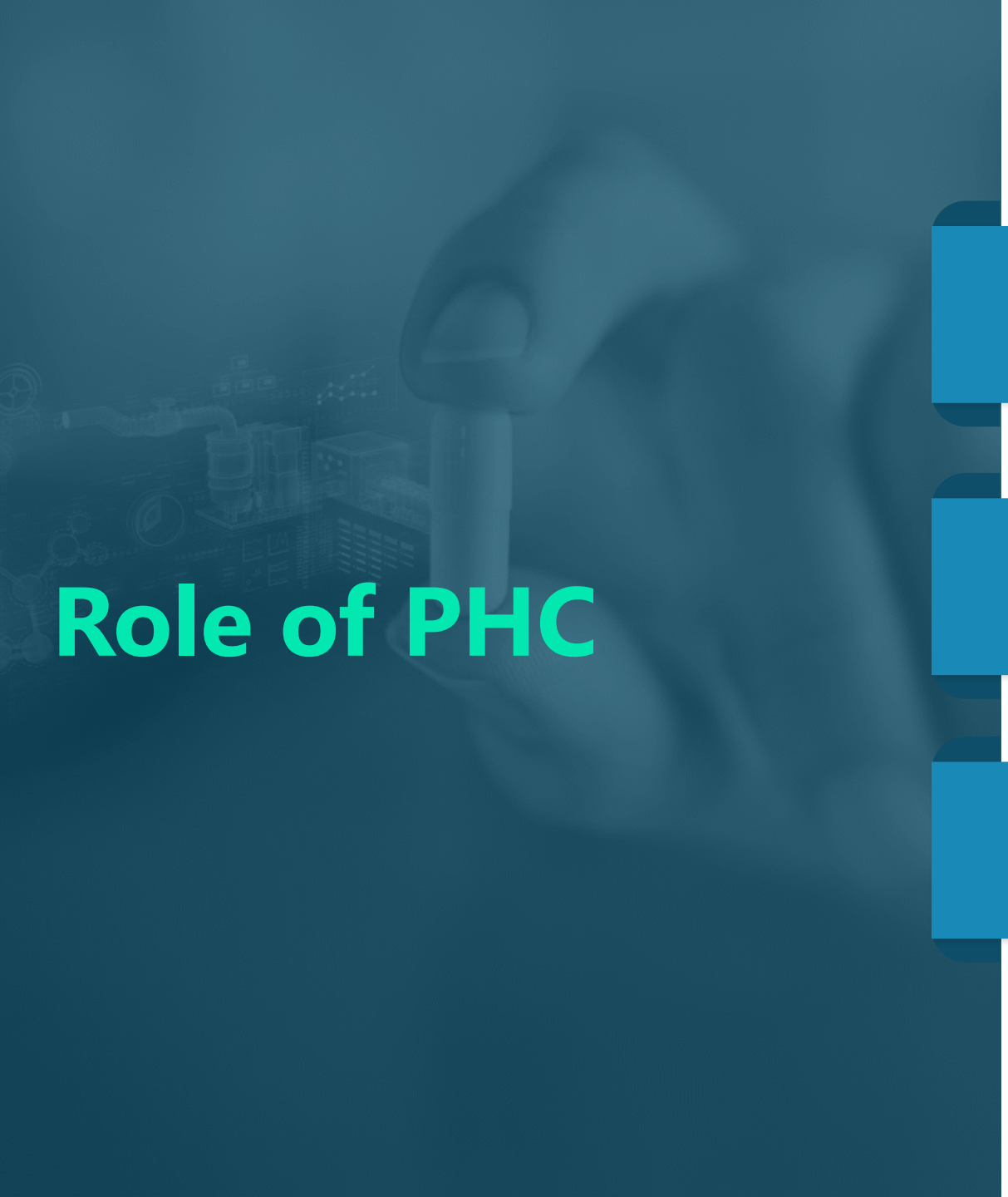
Management:

Non operative:

- Observation
- Bracing
- Medical management:
  calcitonin (<5days)
  Bisphosphonates
  Extension orthosis.(compliance)

Operative:

- Vertebroplasty
- Kyphoplasty
- Surgical decompression and stabilization.



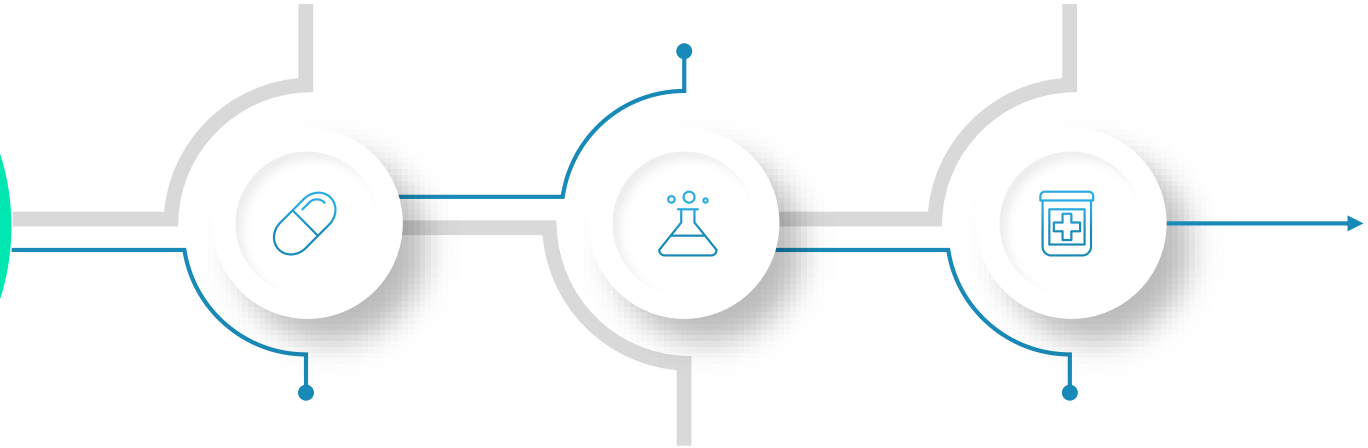
Role of PHC

Low back pain (LBP) is a common clinical problem with major socioeconomic importance.

Approximately 70% to 85% of adults are affected by LBP at some point during their lifetime.

90% of patients recover without sequelae.

Role of PHC



Ask
about and address the patient's concerns and goals. (patient centered care)

Relief pain

Referral

Prevention

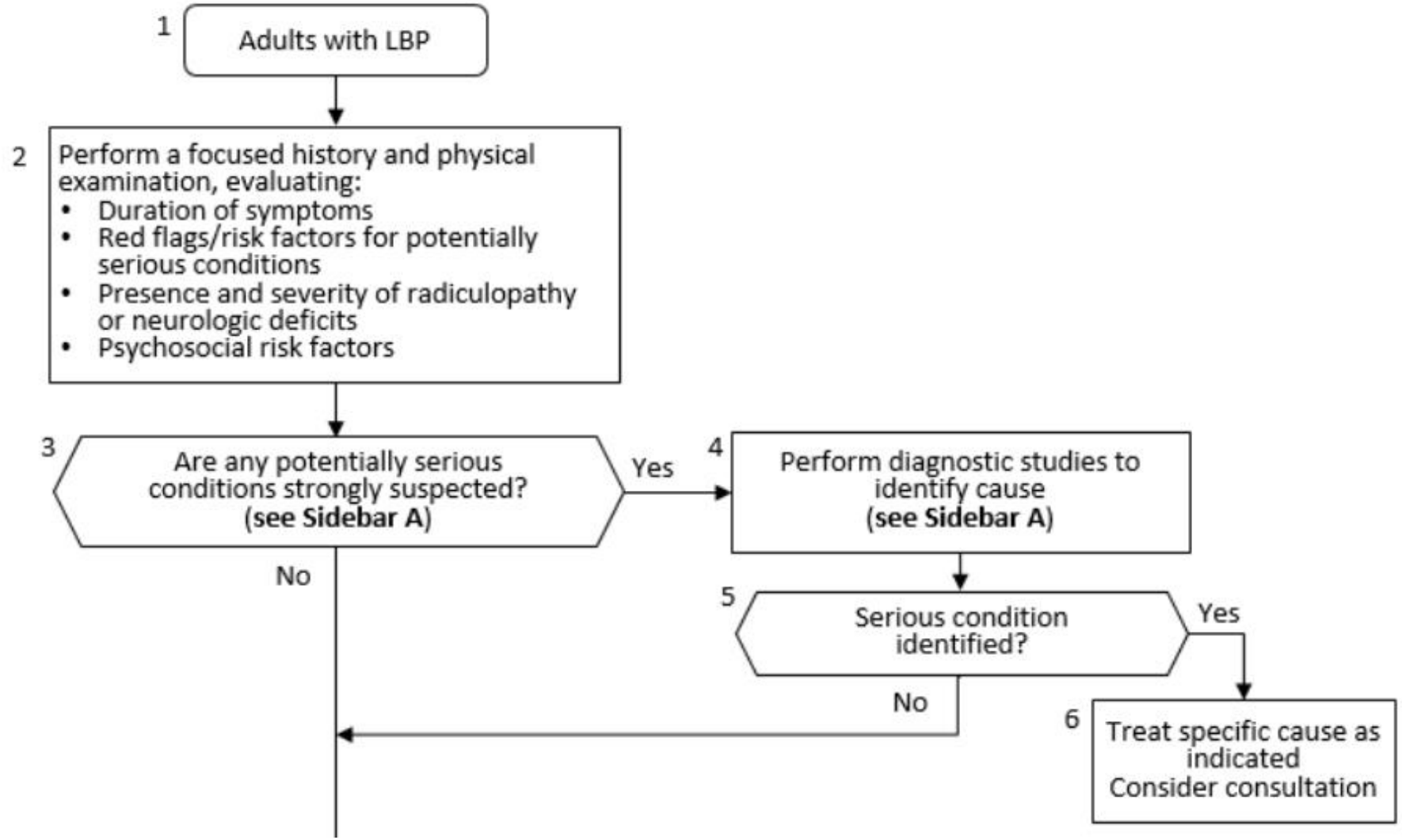
Educate
patient about the natural history of back pain.

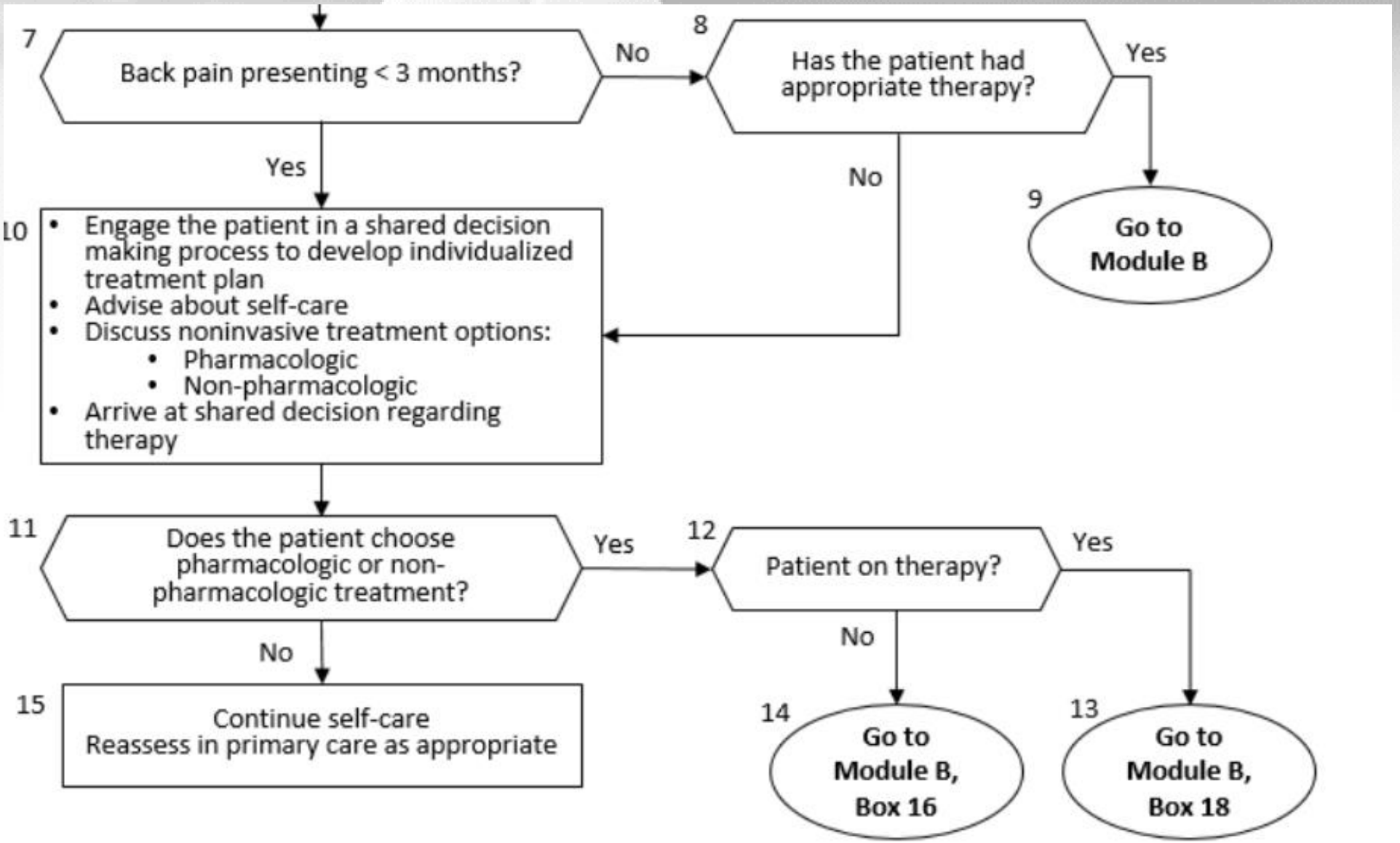
Maximize
functional status.

Improve
associated symptoms, such as sleep or mood disturbances or fatigue.

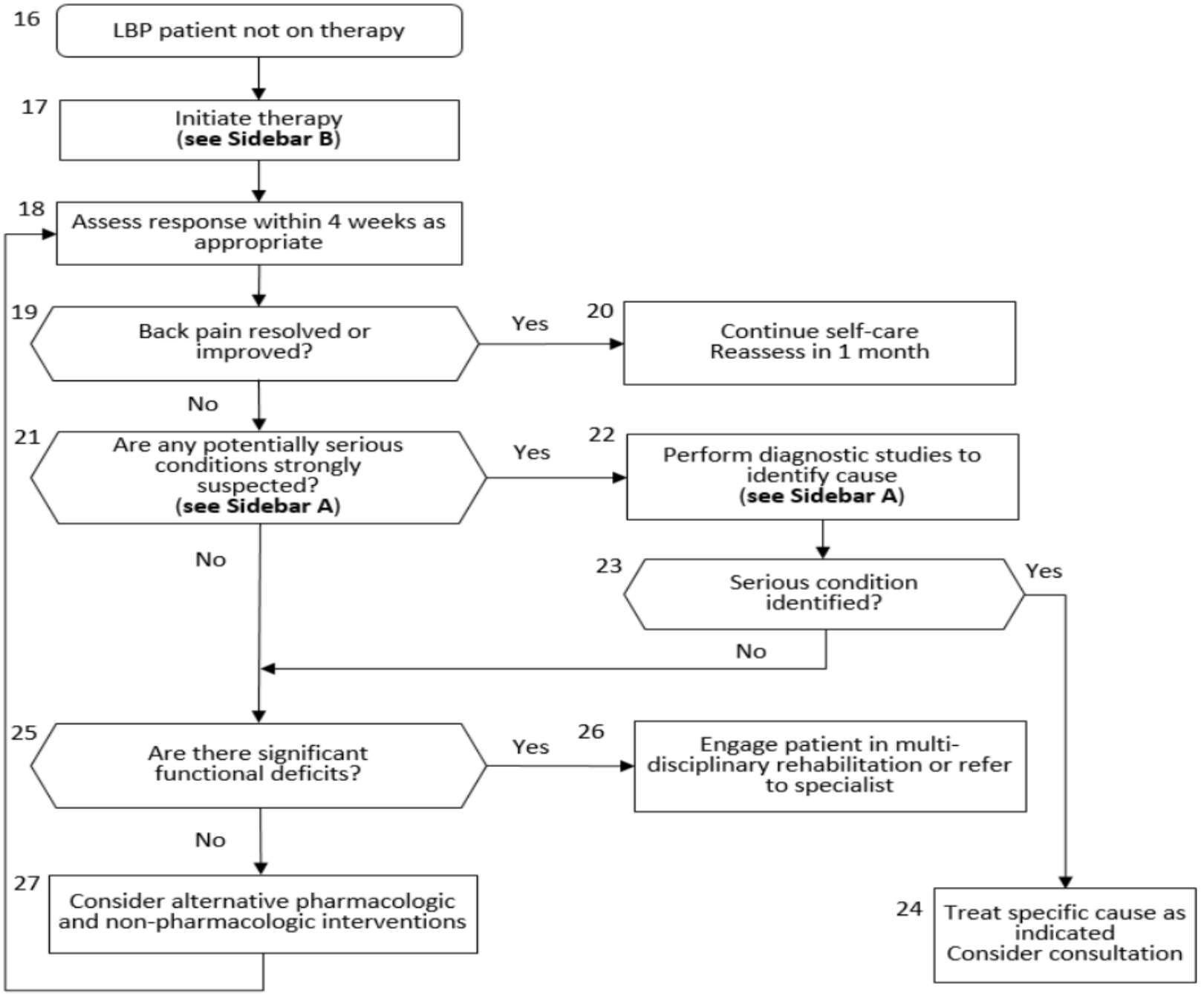
Patients in CORE group had a two-fold sustained improvement in pain and function status. And had used 3x less specialized imaging tests at 3 months.

A. Module A: Initial Evaluation of Low Back Pain




7
Back pain presenting < 3 months?
No
8
Has the patient had appropriate therapy?
Yes
9
Go to Module B
No
Yes
10
Engage the patient in a shared decision making process to develop individualized treatment plan
Advise about self-care
Discuss noninvasive treatment options:
Pharmacologic
Non-pharmacologic
Arrive at shared decision regarding therapy
11
Does the patient choose pharmacologic or non-pharmacologic treatment?
Yes
12
Patient on therapy?
Yes
No
14
Go to Module B, Box 16
13
Go to Module B, Box 18
No
15
Continue self-care
Reassess in primary care as appropriate

B. Module B: Management of Low Back Pain



Sidebar B: Interventions			
		Low Back Pain Duration	
Category	Intervention	Acute < 4 Weeks	Subacute or Chronic > 4 Weeks
Self-care	Advice to remain active	X	X
	Books, handout	X	X
	Application of superficial heat	X	
Non-pharmacologic therapy	Spinal manipulation		X
	Clinician-guided exercise		X
	Acupuncture		X
	CBT and/or mindfulness-based stress reduction		X
	Exercise which may include Pilates, tai chi, and/or yoga		X
Pharmacologic therapy	NSAIDs	X	X
	Non-benzodiazepine skeletal muscle relaxants	X	
	Antidepressants (duloxetine)		X
Other therapies	Intensive interdisciplinary rehabilitation		X

Abbreviations: CBT: cognitive behavioral therapy; NSAIDs: nonsteroidal anti-inflammatory drugs

When to refer surgical?

Cauda equina.

Severe or progressive neurological defect.

Meets 4 of the criteria :
1- Leg pain is equal to or worse than back pain.
2- +SLRT.
3- No response to conservative therapy for 4 to 6 weeks in disc herniation.
4- Imaging shows lesion corresponding to symptoms.

When to refer diagnostic?

No improvement with conservative therapy in sciatica patients.

Suspicion of fracture, infection and tumors.

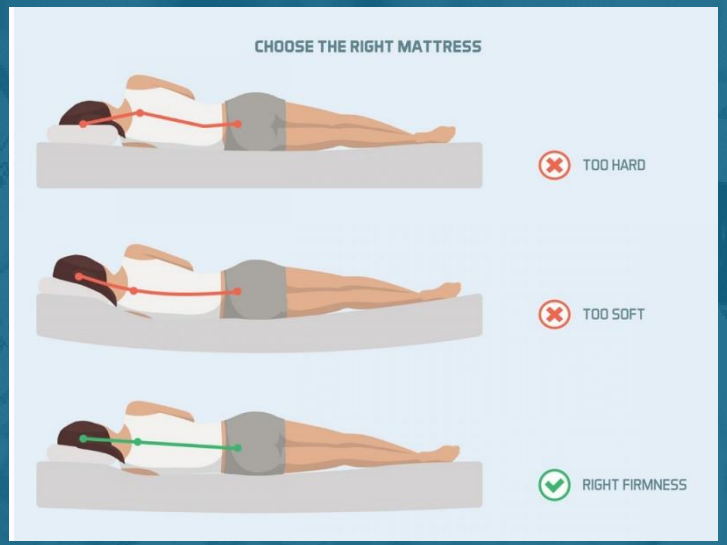
Sometimes referral is simply to provide reassurance.

Prevention and education

Weight loss + exercise

Obese women and men had an approximately 20% increased risk of chronic pain in both the low back and the neck/shoulders. Exercising for 1 or more hours per week compensated, to some extent, for the adverse effect of high BMI on risk of chronic pain.

Sleep



Footwear

Flat foot and hyper-pronation/ Hyper-supination can lead to back pain so proper footwear/orthotics can help in these cases.

Lifting and carrying

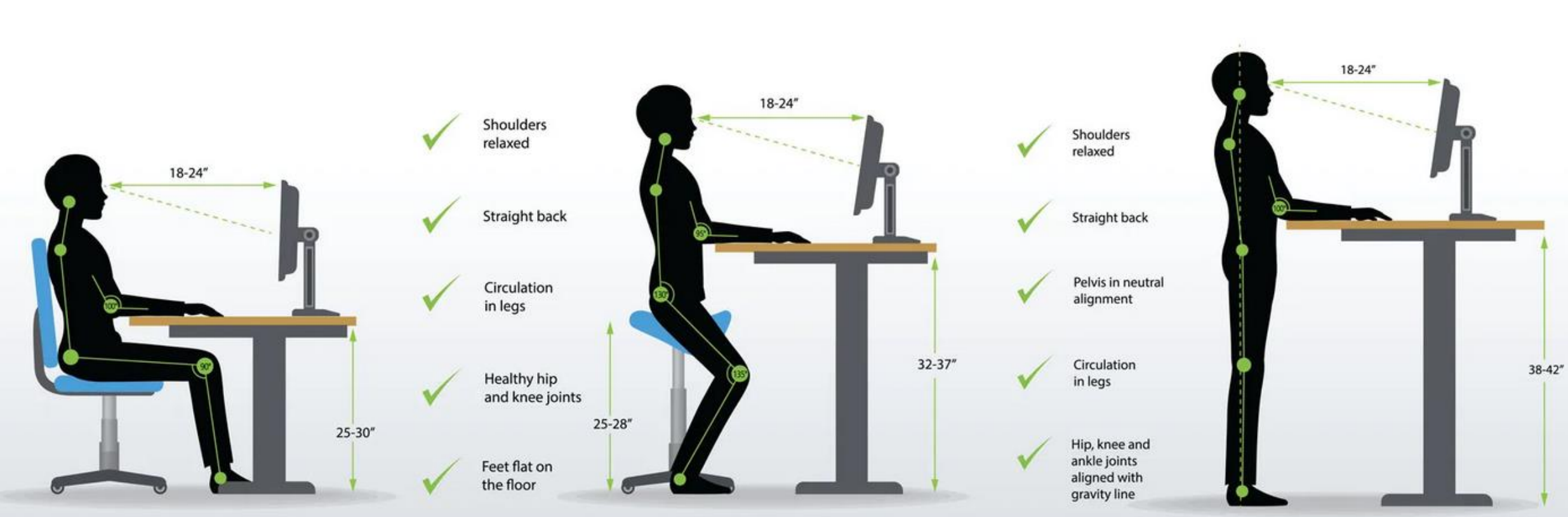
One of the biggest causes of back injury is lifting or handling objects incorrectly.

Repeated heavy lifting or a sudden awkward movement can strain back muscles and spinal ligaments.

Push rather than pull – if you must move a heavy object across the floor, it is better to push it rather than pull it.

constant strain on the back can cause painful muscle spasms.

Posture


18-24"
25-30"
Shoulders relaxed
Straight back
Circulation in legs
Healthy hip and knee joints
Feet flat on the floor
18-24"
25-28"
32-37"
Shoulders relaxed
Straight back
Pelvis in neutral alignment
Circulation in legs
Hip, knee and ankle joints aligned with gravity line
18-24"
38-42"

MCQ

1- Which of the following is the most common cause of Lower Back Pain ?

a. Metastatic bone disease

b. Inflammatory back pain

c. Lumbosacral sprain or strain

d. Herniation

MCQ

2- Which of the following is considered as Red flag in Lower Back Pain?

a. History of dysmenorrhea

b. Steroid use

c. Night pain

d. Age more than 40

MCQ

3- Which of the following is a feature of inflammatory process?

a. Usually acute in progression

b. Worse while exercise

c. 60 minutes of morning stiffness

d. Age more than 50

MCQ

4- Patient came to FM clinic complaining of intermittet LBP for 2 years that radiates to thigh and legs, it gets worse with prolonged standing and relived by forward flexion. No motor deficits or any other worrisome symptoms.
How would you manage this patient ?

a. Increase physical activity time

b. Bed rest

c. Analgesia (NSAIDS)

d. Refer to neurology

MCQ

5- Positive Adams Forward bending test indicates ……. ?

a.Lordosis

b. Kyphosis

c. Compression fracture

d. Scoliosis

THANK YOU

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Demographic: Name, Age and Occupation

- HPI
  - Pain (SOCRATES) Pain radiating to legs? Does pain respond to pain killers? Pain at night?
  - Aggravating: Movement? Flexion or extension?
  - Relieving: Rest? Flexing or extension?
  - Associated symptoms: Limping? Loss of function? Weakness and altered sensation(profound or progressive)? Stiffness?
  - Cauda Equina: Sphincter disturbances and saddle anesthesia.
  - Previous episodes of back pain? Lifting heavy objects?
  - Menstrual cycle changes in females for PID
  - GI Symptoms
- Constitutional symptoms: Fever, Chills, Night sweats, Unexplained Weight loss, loss of appetite.
- PMH: History of cancer? History of infections?
- PSH: Surgery to the spine? Transfusion?
- Trauma history -> High energy?
- Medications: Corticosteroids? Immunosuppressive medications?
- Allergies
- Family Histo of cancer or chronic diseases
- Social history (Smoking–Occupation –Alcohol –IV drug abuse -Travel)