Low Back Pain

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Case scenario

Haya is a 42 year old housewife who comes to the ER complaining of severe low back pain

- **What is Haya's presenting problem?**
- **Generate a list of possible causes for the problem?**

Differential diagnosis:

Spinal etiologies		Extra-spinal etiologies
Mechanical pain	Muscular strain	Peptic ulcer, pancreatitis
	Degenerative processes of disc and facet joint	
	Disc herniation and spinal stenosis	
	Spondylolisthesis	Dissecting abdominal aortic aneurysm
	Spondylolysis	
Inflammation	Ankylosing spondylitis	
	Psoriatic spondylitis	Pyelo-nephritis
Spinal infection	Tuberculosis	
	Osteomyelitis	
	Brucellosis	Pelvic inflammatory disease, endometriosis
Spinal tumor	Multiple myeloma	
	Metastatic carcinoma	
Vertebral fracture		

Spine fracture

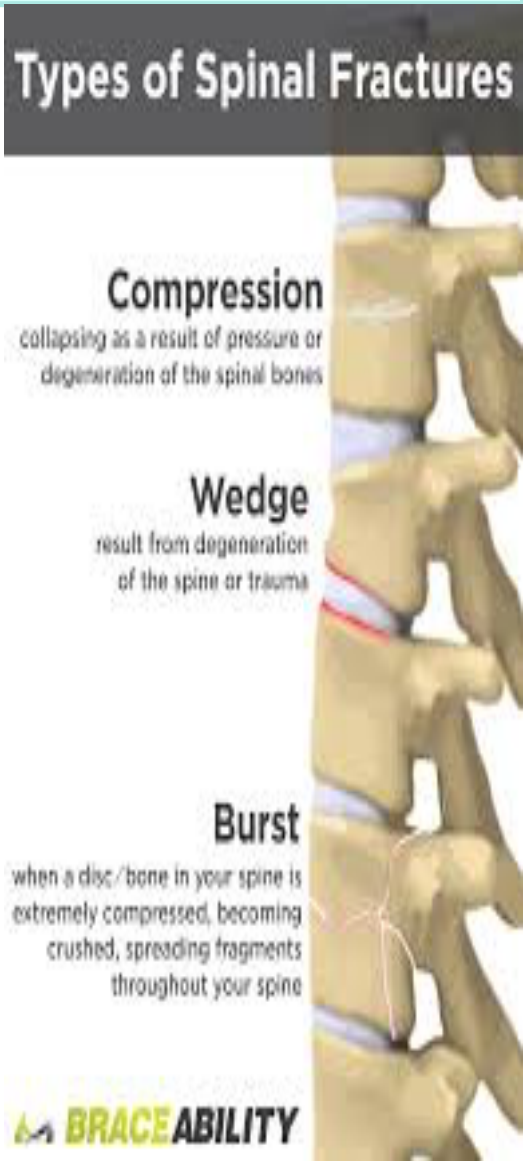
Etiology:
Trauma: Car accidents (45%), falls (20%), sports (15%), acts of violence (15%),

Symptoms:
- Pain, numbness, tingling, muscle spasm,
- Weakness, bowel/bladder changes,
- Paralysis

Investigations
1. History
2. Physical examination.
3. Imaging:

X-ray, CT, or MRI.

Treatment:
Brace, vertebroplasty..

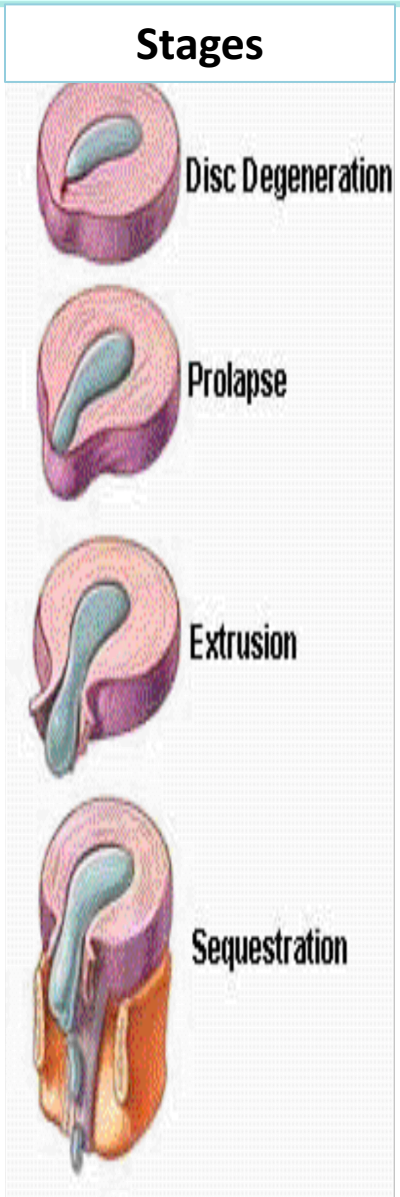


Lumber Disc Herniation

Definition:
a tear in the outer, fibrous ring of an intervertebral disc allows the soft, central portion to bulge out beyond the damaged outer rings.

Etiology:
1.Disc degeneration (mostly)
2.Injury

Risk factors:
- Age,
- Gender,
- Physically demanding work,
- obesity,
- smoking
- and family history.



Lumber Disc Herniation

Symptoms:

Investigations:

1. History
2. Physical examination.
3. Imaging:

X-ray, CT or MRI being the most accurate.

Treatment:

❖ **Non surgical: (1st line)**

Analgesics, muscle relaxants and physiotherapy.

❖ **Surgical:**

Indicated when: failure of conservative and in severe cases

Description	Stenosis	Disc Herniation
Age	Usually > 50 years	Usually < 50 years
Onset	Insidious	Sudden
Positional changes		
Sitting (Flexion)	Better	Worse
Extension	Worse	Better
Focal motor weakness	Less Common	Common
Dural tension signs	Less Common	Common
Focal muscle stretch reflex changes	Less Common	Common

Cauda equine syndrome

Definition:
is a rare disorder that usually is a surgical emergency. In patients with cauda equina syndrome, when there is compression on the spinal nerve roots.

Etiology:
Severe herniated disk in the lumbar area (the most common cause).
Spinal stenosis, Tumor, infection or Trauma.

Symptoms:
- Saddle anesthesia.
- Urinary or fecal incontinence.
- Sexual dysfunction.

Investigations
1. History
2. Physical examination.
3. Imaging:

X-ray, CT, myelogram or MRI.
Treatment: Surgical..

Spinal infection

Definition:

rare infections that can involve the intervertebral disc space, the vertebral bones, the spinal canal, or adjacent soft tissues.

Etiology:

Generally, infections are bacterial and spread to the spine through the bloodstream. The most common organism in spinal infection is from the bacteria *Staphylococcus aureus or TB* .

Symptoms:

- fevers,
- chills,
- night pain,
- unexplained weight loss

Investigations

1. History
2. Physical examination.
3. Labs: Blood cultures
4. Imaging: X-ray, CT, or MRI.

Treatment: intravenous antibiotic medications, bracing, and rest.

Spinal Tumor

Etiology:
Often they are metastatic

Symptoms:
Back pain along with constitutional symptoms, such as loss of appetite, unplanned weight loss, nausea, vomiting, or fever, chills or shakes.

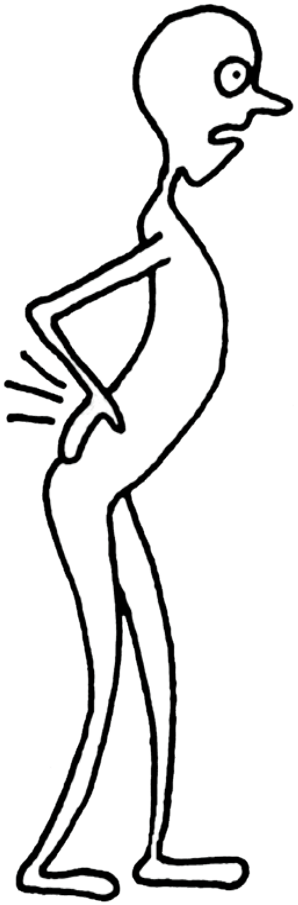
Investigations

1. History
2. Physical examination.
3. Imaging:

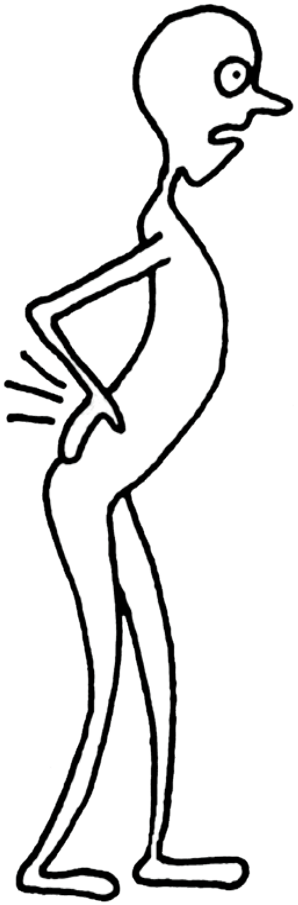
X-ray, CT, or MRI.

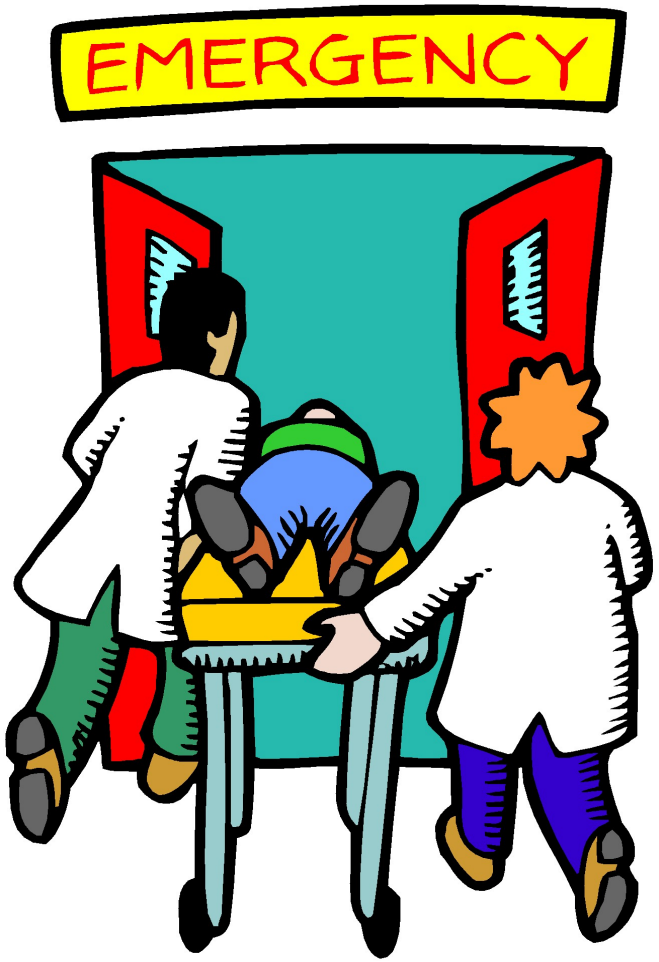
Treatment:
Surgical, Chemo and radiotherapy depending on the type..

Diagnosis



History




EMERGENCY

Differential diagnosis:

Spinal etiologies		Extra-spinal etiologies
Mechanical pain	Muscular strain	Peptic ulcer, pancreatitis
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	Osteomyelitis	
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	Metastatic carcinoma	
Vertebral fracture		

History

- **Patient identification:** name, age, occupation
- **Chief complain**
- **History of presenting illness:**
  - **<u>SOCRATES:</u>**
    - **Site**
    - **Onset and progression:** How did it start? First time? Awake you from sleep? Affect your daily life?
    - **Character**
    - **Radiation**
    - **Aggravating and Relieving factors**
    - **Timing**
    - **Severity**

History

Associated symptoms

- Pain in other joints
- Joints swelling
- Is it activity induced
- Morning stiffness
- Numbness
- Paresthesia
- Systemic manifestations

Constitutional symptoms

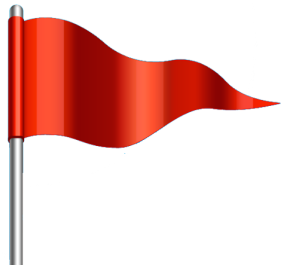
- Nausea
- Vomiting
- Fever
- Night swats
- Fatigue
- Loss of appetite
- Loss of weight

Any risk factor?

- Smoking
- Obesity
- Age
- Female gender
- Physically/Psychologically strenuous work
- Sedentary work
- Low educational attainment
- Psychologic factors such as somatization disorder, anxiety, and depression

History

Any red flags?



- **Cauda Equina Syndrome** (Urinary retention with overflow – fecal incontinence – saddle anesthesia).
- **Tumor** (previous history of cancer and presence of constitutional symptoms).
- **Infection** (previous history of infection, family history of infection, Drug abuse, Travel history and constitutional symptoms).
- **Spine fracture** (History of recent trauma and history for other fracture).
- **Red flag symptoms or history:**
  - New pain aged <10 or >60
  - History of cancer
  - Immunosuppressed
  - Night pain or thoracic pain
  - Rapid onset of neurological symptoms
  - Bladder or bowel disturbance

History

- **Past medical and surgical history**
- **Drugs and allergies**
- **Family history**
- **Social history:** (Smoking – Allergy – Alcohol – IV drug abuse –Travel)
- **Systemic review**

Differential diagnosis:

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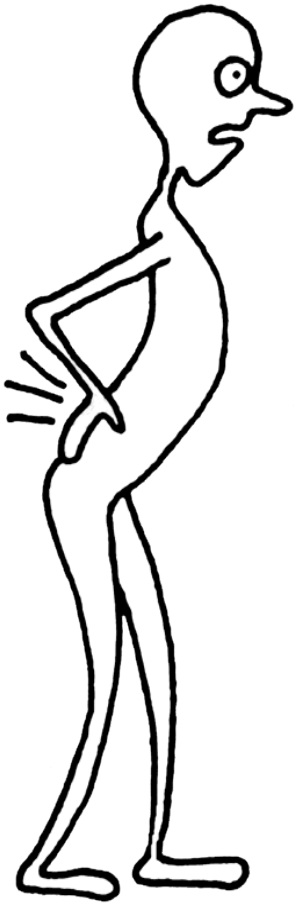
Vertebral fracture		

Examination



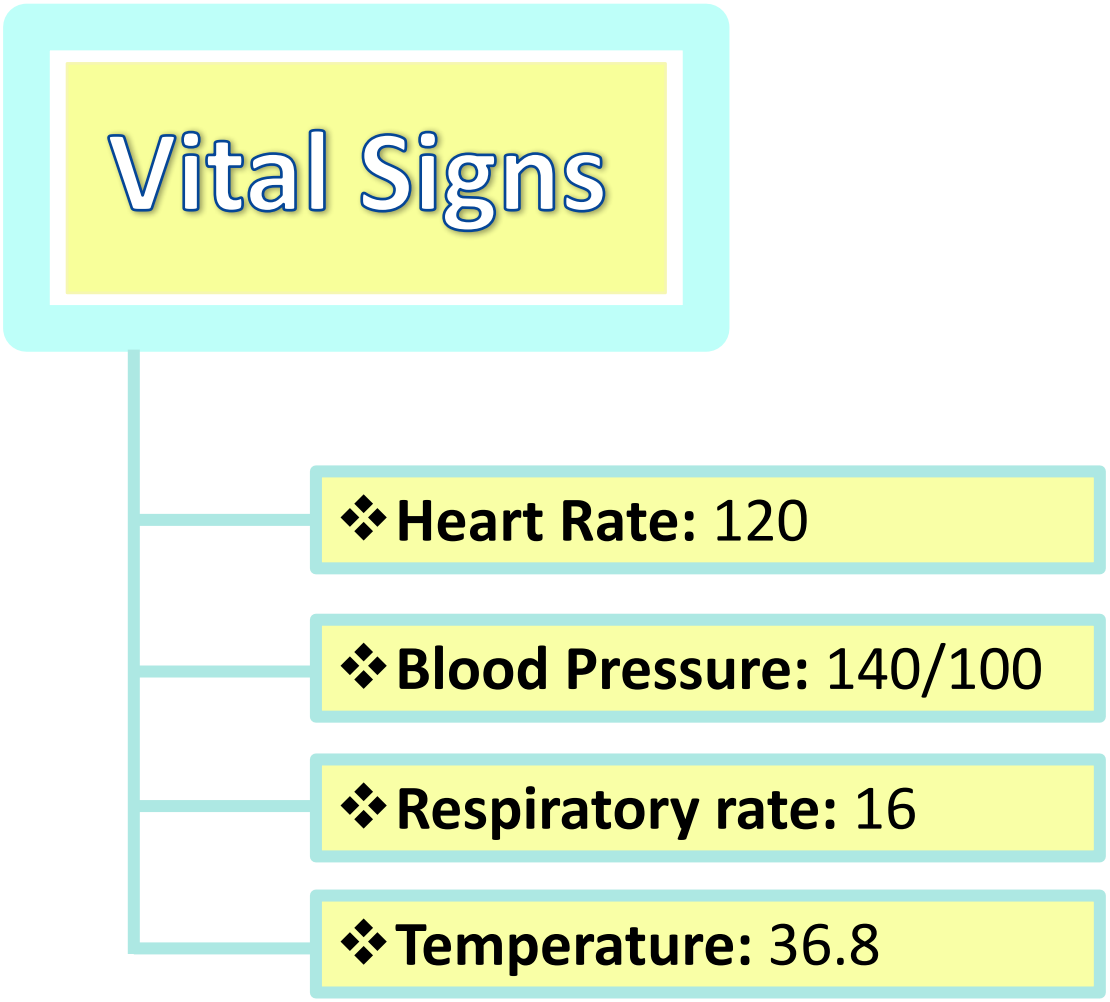
Vital Signs

General Examination

Spine Examination

Neurovascular Examination

Rectal exam


Vital Signs
❖ Heart Rate: 120
❖ Blood Pressure: 140/100
❖ Respiratory rate: 16
❖ Temperature: 36.8

General Examination

- Unable to sit still, in severe pain
- Normal general examination, abdomen is soft, no masses or pulsations felt, costo-veterbral angle is non-tender, pelvic examination is normal

Spine Examination

- **Standing position:**
- **Look:**
  - Expose the trunk and lower limbs properly.
  - Examine front and back.
  - Any deformity, swelling, or skin changes
  - Shoulders & pelvis level.
  - Gait

- **Patient finding:** reduced lumbar lordosis

Spine Examination

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

- **Patient finding:** no bone tenderness, skin is normal temperature, no deformity was observed, paraspinal muscle spasm

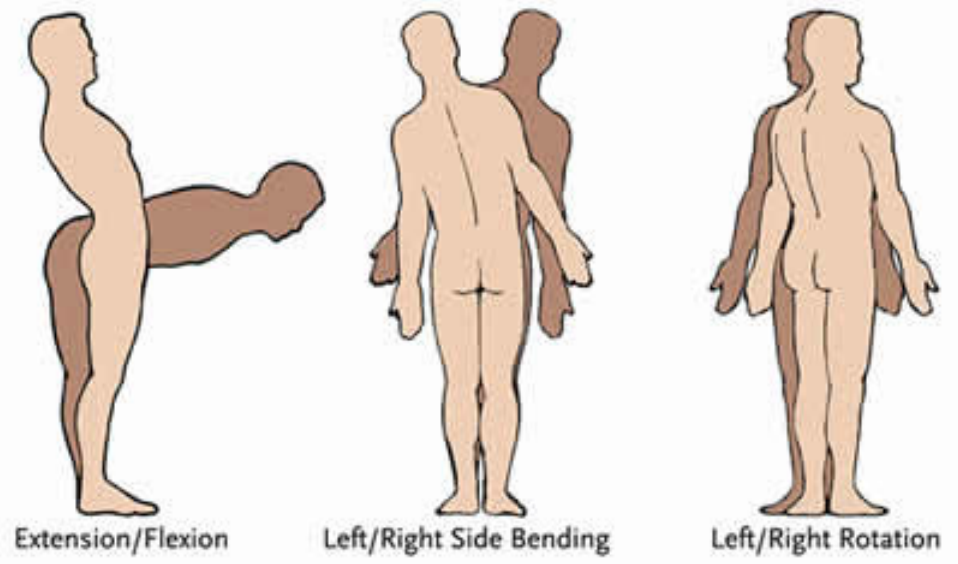
Spine Examination

❖ **Move:**

✧ Active ROM in all 6-directions:
- ✧ Flexion.
- ✧ Extension
- ✧ Lateral bending
- ✧ Rotation

✧ Note if painful/painless.

✧ Attempt passive ROM if active ROM is limited and painless, record.



❖ **Patient finding:** Range of motion: extension free, flexion limited significantly

Spine Examination

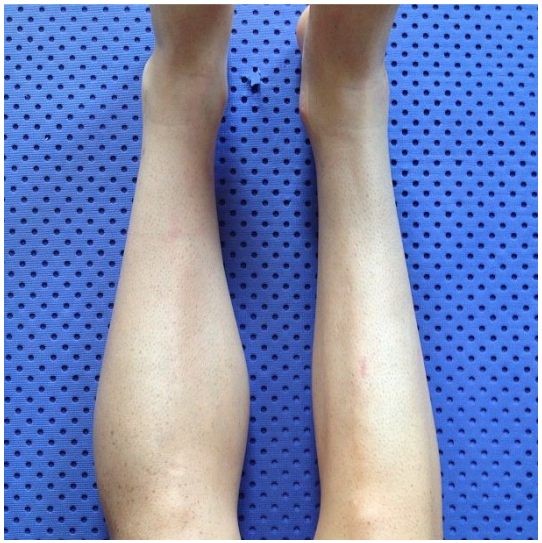
❖ **Special tests:**

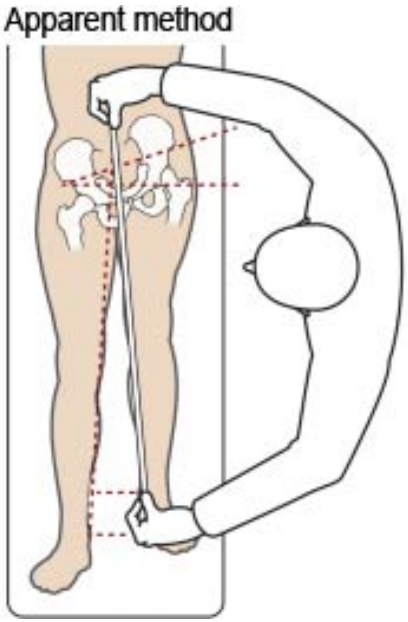
Adams Forward bending test:

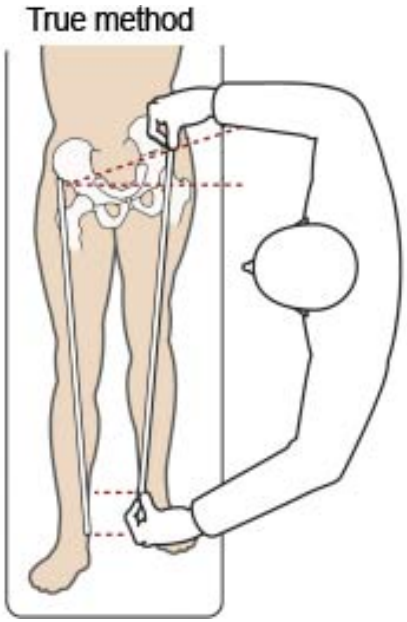
full forward flexion until back is horizontal to the floor. If thoracic scoliosis is present, then rib hump will become visible

Spine Examination

- **Supine position:**
- **Look:** Note any muscle wasting in the lower limbs
- **Feel:** Check for Leg length discrepancy (ASIS to medial malleolus).





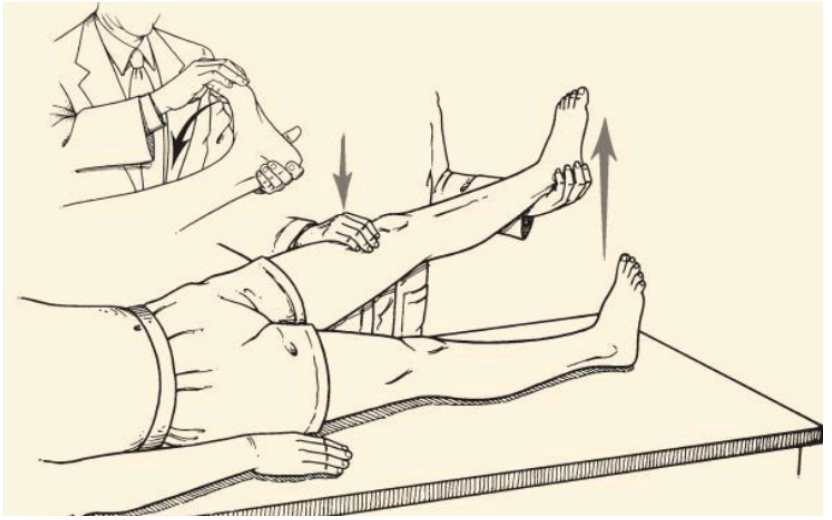


Spine Examination

❖ **Special tests:**

<u>Straight leg raising test (SLRT):</u>

- ✧ 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 sign of discomfort.
- ✧ positive test is reproduction of sciatica-i.e. sharp shooting pain that radiates below the knee- between 30° and 70°of hip flexion.



Patient finding: Positive right SLRT at 45°

Neurovascular Examination

❖ **Neurologic examination:**

✧ Motor: Hip flexion=L2, knee extension=L3, Ankle dorsiflexion=L4, EHL=L5, Ankle plantar flexion=S1.

✧ Sensory: dermatomes.

✧ Tone: normal, flaccid or rigid.

✧ Reflexes: knee & ankle jerks.

❖ **Vascular examination:**

✧ Pedal pulses (DP & PT).

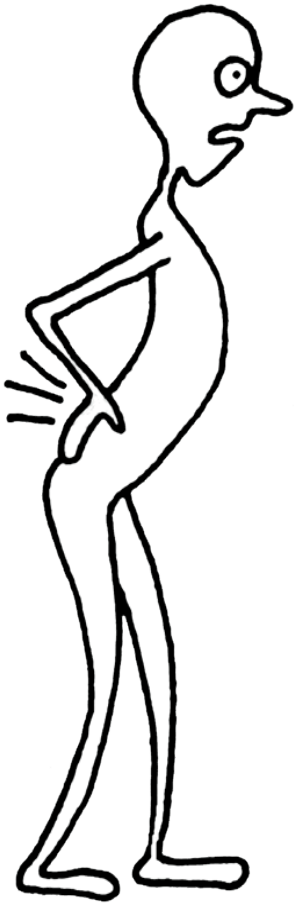
✧ Capillary refill (normal < 2 seconds).

Patient finding: palpable pulses in feet, reduced sensation over the saddle area, reduced ankle and knee jerk.

Rectal Examination

Patient finding: bladder dysfunction, poor anal sphincter tone

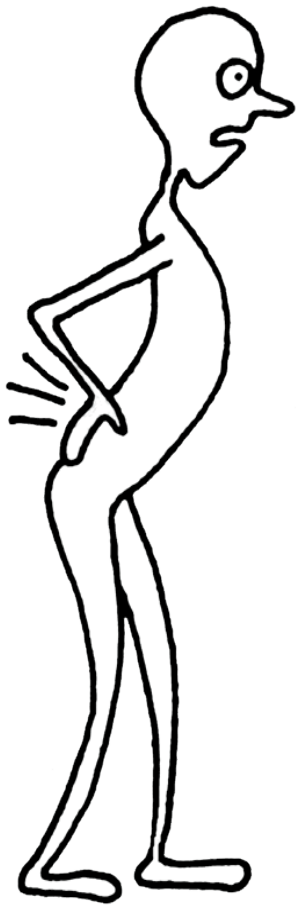
Investigation



Investigation

Imaging:

- Do not routinely offer imaging in a non-specialist setting for people with low back pain with or without sciatica.
- Explain to people with low back pain with or without sciatica that if they are being referred for specialist opinion, they may not need imaging.
- Consider imaging in specialist settings of care (for example, a musculoskeletal interface clinic or hospital) for people with low back pain with or without sciatica only if the result is likely to change management.



What's the most likely diagnosis?

Differential diagnosis:

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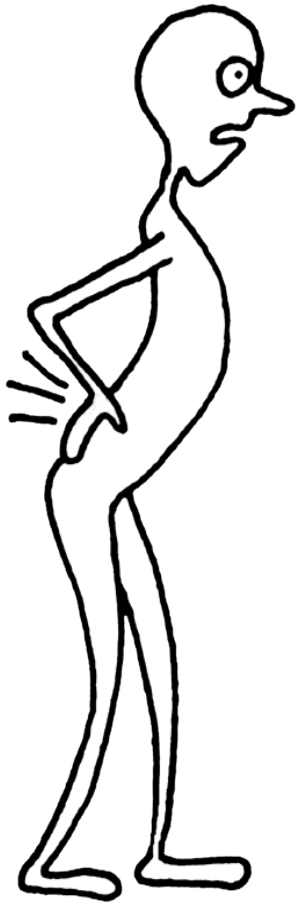
Cauda Equina Syndrome



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

Mechanical & Inflammatory Back Pain

Character	Inflammatory back pain	Mechanical back pain
Age of onset	< 40 Years	Any Age
Type of onset	gradual	Acute
Symptoms duration	> 3 Months	< 4 Weeks
Morning stiffness	> 30 Minuets	< 30 Minuets
Timing	Night, early morning	End of day, following activity
Effect of exercise	Improvement	Exacerbation
Sacroiliac joint tenderness	Frequent	Absent
Back mobility	Loss in all planes	Abnormal flexion
Radiation	More localized, bilateral	Tends to be diffuse, unilateral
Nature of the pain	Aching, throbbing	Deep dull ache, sharp if root compression

Root nerve compression

Direct Nerve Root Compression		
Character	**Spinal Stenosis**	**Root Compression**
Pain Dominance	Leg	Leg
Aggravation	Exercise, extension, walking, standing	Flexion
Onset	Congenital or acquired	Acute leg ± back pain
Duration	Acute or chronic history (weeks to months)	Short episodes Attacks (minutes)
Pain Dominance Onset Treatment Treatment	Relief of strain, exercise	Relief of strain, exercise + surgical decompression if progressive or severe deficit

Malignancy

- ✧ Important to identify malignant disease as early as possible because of the effect of a delayed diagnosis on treatment and prognosis.
- ✧ More than one nerve root may be involved
- ✧ The neurological signs will be progressive.
- ✧ Age >50 years.
- ✧ Patient usually has constitutional symptoms.

❖ **Primary Spinal tumors:**

- Rare.
- Benign (e.g. osteoid osteoma) or malignant (e.g. chordoma).
- Management depends on pathology.

❖ **Spinal metastasis:**

- Very common.
- Biopsy required if primary unknown.
- Six main primary malignancies that metastasize to the spine from (prostate, breast, lung, thyroid, kidney and melanoma).

Role of PHC in Back Pain

- **Educate** patient about the natural history of back pain.
- **Ask** about and address the patient's concerns and goals.
- **Maximize** functional status.
- **Relief** the pain.
- **Improve** associated symptoms, such as sleep or mood disturbances or fatigue.
- **Referral** of complicated cases.
- **Preventio**

When to refer?

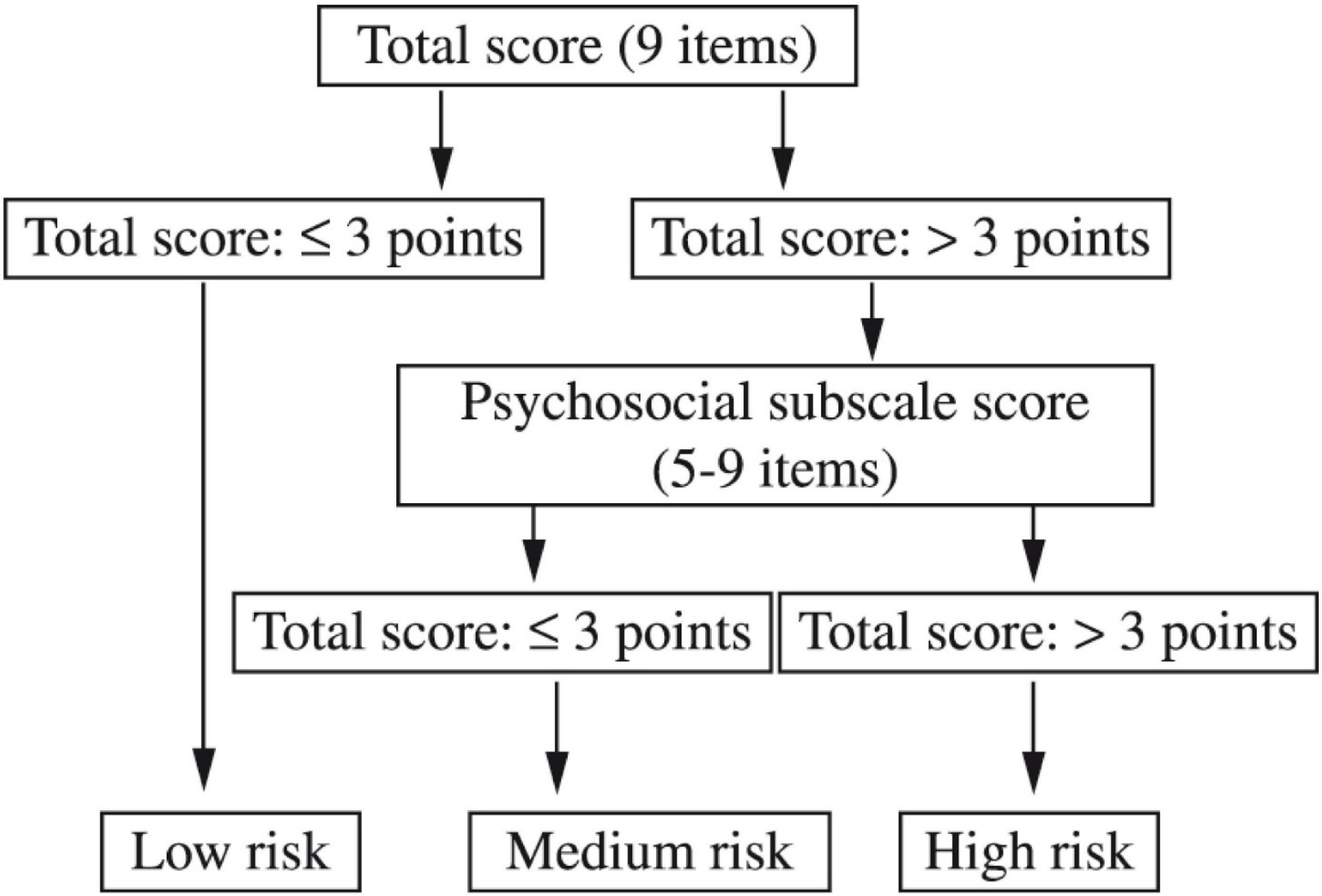
Urgent/Emergency referrals :

1. Cauda equina
2. Sever radiculopathy (sciatica).
3. Fractures.

Other referrals

1. Recalcitrant spinal canal stenosis
2. Neoplasia or infection
3. Undiagnosed back pain
4. Paget disease
5. Continuing pain of 3 months' duration without a clearly definable cause

STarT Back Screening Tool



The Keele STarT Back Screening Tool

Patient name: _____ Date: _____

Thinking about your back pain the **last 2 weeks** tick your response to the following questions:

		Yes 1	No 0
1	Has your back pain spread down your leg(s) at some time in the last 2 weeks?	☐	☐
2	Have you had pain in the shoulder or neck at some time in the last 2 weeks?	☐	☐
3	Have you only walked short distances because of your back pain?	☐	☐
4	In the last 2 weeks, have you dressed more slowly than usual because of back pain?	☐	☐
5	Do you think it's **not** really safe for a person with a condition like yours to be physically active?	☐	☐
6	Have worrying thoughts been going through your mind a lot of the time?	☐	☐
7	Do you feel that your back pain is terrible and it's never going to get any better?	☐	☐
8	In general have you stopped enjoying all the things you usually enjoy?	☐	☐

9. Overall, how **bothersome** has your back pain been in the **last 2 weeks**?

Not at all	Slightly	Moderately	Very much	Extremely
☐	☐	☐	☐	☐
0	0	0	1	1

Total score (all 9): _____ **Sub Score (Q5-9):_____**

Self-management

1.2.1 Provide people with advice and information, tailored to their needs and capabilities, to help them self-manage their low back pain with or without sciatica, at all steps of the treatment pathway. Include:

•information on the nature of low back pain and sciatica

•encouragement to continue with normal activities.

Exercise

1.2.2 Consider a group exercise programme (biomechanical, aerobic, mind–body or a combination of approaches) within the NHS for people with a specific episode or flare-up of low back pain with or without sciatica. Take people's specific needs, preferences and capabilities into account when choosing the type of exercise.

Orthotics

1.2.3 Do not offer belts or corsets for managing low back pain with or without sciatica.

1.2.4 Do not offer foot orthotics for managing low back pain with or without sciatica.

1.2.5 Do not offer rocker sole shoes for managing low back pain with or without sciatica.

Manual therapies

1.2.6 Do not offer traction for managing low back pain with or without sciatica.

1.2.7 Consider manual therapy (spinal manipulation, mobilisation or soft tissue techniques such as massage) for managing low back pain with or without sciatica, but only as part of a treatment package including exercise, with or without psychological therapy.

Acupuncture

1.2.8 Do not offer acupuncture for managing low back pain with or without sciatica.

Electrotherapies

1.2.9 Do not offer ultrasound for managing low back pain with or without sciatica.

1.2.10 Do not offer percutaneous electrical nerve simulation (PENS) for managing low back pain with or without sciatica.

1.2.11 Do not offer transcutaneous electrical nerve simulation (TENS) for managing low back pain with or without sciatica.

1.2.12 Do not offer interferential therapy for managing low back pain with or without sciatica.

Psychological therapy

1.2.13 Consider psychological therapies using a cognitive behavioural approach for managing low back pain with or without sciatica but only as part of a treatment package including exercise, with or without manual therapy (spinal manipulation, mobilisation or soft tissue techniques such as massage).

Combined physical and psychological programmes

1.2.14 Consider a combined physical and psychological programme, incorporating a cognitive behavioural approach (preferably in a group context that takes into account a person's specific needs and capabilities), for people with persistent low back pain or sciatica:

•when they have significant psychosocial obstacles to recovery (for example, avoiding normal activities based on inappropriate beliefs about their condition) **or**

•when previous treatments have not been effective.

Return-to-work programmes

1.2.15 Promote and facilitate return to work or normal activities of daily living for people with low back pain with or without sciatica.

Role Play

Prevention

Prevention of cauda equina syndrome is focused on early diagnosis by identifying the symptoms described previously. While low back pain with leg pain or weakness is a common complaint that affects many people, cauda equina syndrome is a rare complication. Patients should be educated on signs and symptoms that could suggest possible cauda equina syndrome, including change in bowel or bladder function and loss of sensation in the groin.

Prevention

The surgery should be done within 24 or 48 hours of the onset of serious symptoms, such as:
serious lower back pain
sudden loss of feeling, weakness, or pain in one or both legs
recent onset of rectal or urinary incontinence
loss of reflexes in your lower extremities
This can help prevent irreversible nerve damage and disability. If the condition is left untreated, patient could become paralyzed and develop permanent incontinence.

Education (counselling)

What are low back pain?

Low back pain is soreness or stiffness in the back, between the bottom of your rib cage and the top of your legs. Most people's low back pain is described as 'non-specific'. That means the pain is unlikely to be caused by an infection, a fracture or a disease like cancer.

Making decisions together

The patient should be part of all decisions about their care so they can agree which approaches that are likely to suit them the best. The healthcare team should involve them by:

•talking and listening to them so that they understand what matters to them

•giving them all the information they need so that they can make their mind up

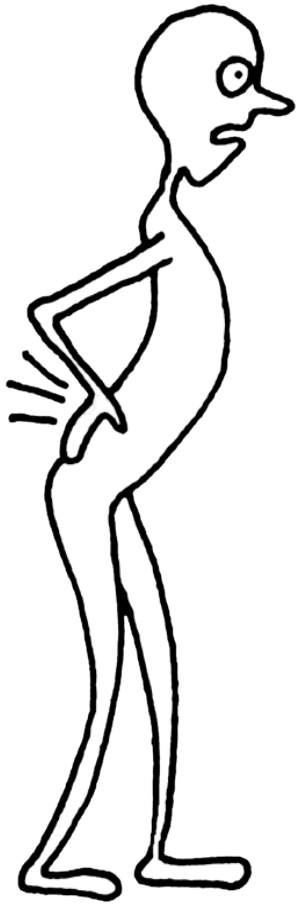
•explaining if they think something that is mentioned won't work for them and why, and discussing other options they could try instead

•giving details for someone in the care team that they can contact if you have any questions.

Questions patient could ask

- What caused my low back pain to come on? Was it something physical, like lifting a heavy weight?
- What can I do to manage my low back pain?
- How can I reduce the effects of the pain on my daily life?
- I'm not being referred for tests. But if I'm still in pain, doesn't this mean there's something seriously wrong?
- Is there anything my family or colleagues could do to help me?
- Why is exercise so important, and how should I do this?
- Is there anyone who can advise me on home and workplace adaptations?
- Why isn't it a good idea to just stay in bed and rest?
- Should I carry on working?
- Is it likely I might have low back pain again? Will it be caused by the same thing?
- Can you give me any leaflets or other information that I can take away

References



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- Browse's introduction to the symptoms and signs of surgical disease
- Lecture notes on orthopedics and fractures.
- NICE guildelines