

# PBL TEAM

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First case

“ the trouble with my back ”

\*We recommend you to have a look at the Anatomy and pharmacology lectures related.

\***Red** is for important things.

\* The videos may contain music.



# Case scenario:

- A 38-year-old construction builder
- He's complaining of a back pain localized in the lower part of his back for the last 5-6 days, **after carrying heavy subjects.**
- He grades his **pain severity** as 5-6 out of 10.
- He describes his pain as a constant dull ache pain, which is **increased by sudden movement of his trunk**
- Coughing and sneezing make his back pain worse.
- Two days ago he noticed pain in his left buttock, back of thigh, and calf muscle.
- The pain is associated with **numbness** in the outer area below the left knee, and the outer toes.
- After taking 2 **paracetamole** tablets the pain goes and he become able to sleep, but in the morning the pain back again.
- He has some stress at work.



## Diagnosis:

After taking some tests (discussed later). The doctor explained that it's possible that **the heavy load** Salem carried has caused sever **pressure on the discs** located between the bones of the back (the vertebrae) → the pressure caused a part of one of the discs between the vertebrae to protrude from its place → causing a little pressure (touch) on one of the spinal nerve and that explains the tingling and numbness he had on his left leg and also explains the back pain which precipitated by coughing, sneezing or moving his trunk forward.

**So the diagnosis is Prolapse disc ( herniated nucleus pulposus ). Or slipped disc.**

**Plain X-Ray of the lumbar spine:** nothing was found.

**CT scan:** Sagittal section shows mild bulge of the disc at L5\S1.

**MRI scan:** Sagittal section shows prolapse of the disc at L5\S1

## Management:

1. The doctor explains that there is no need for surgery.
2. He **prescribes NSAIDs** for 3 weeks, 3 times a day, after meals.
3. Muscle relaxant.
4. He asked him to keep active and walking.

\* Over the next 4 weeks Salem's pain gradually disappear and he was able to resume his daily activities.

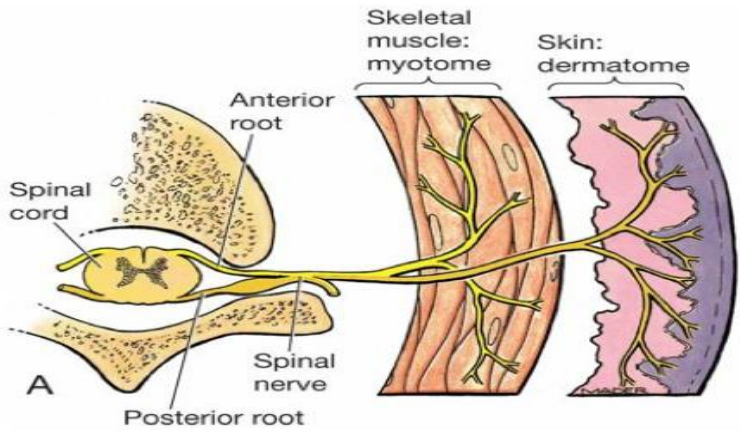
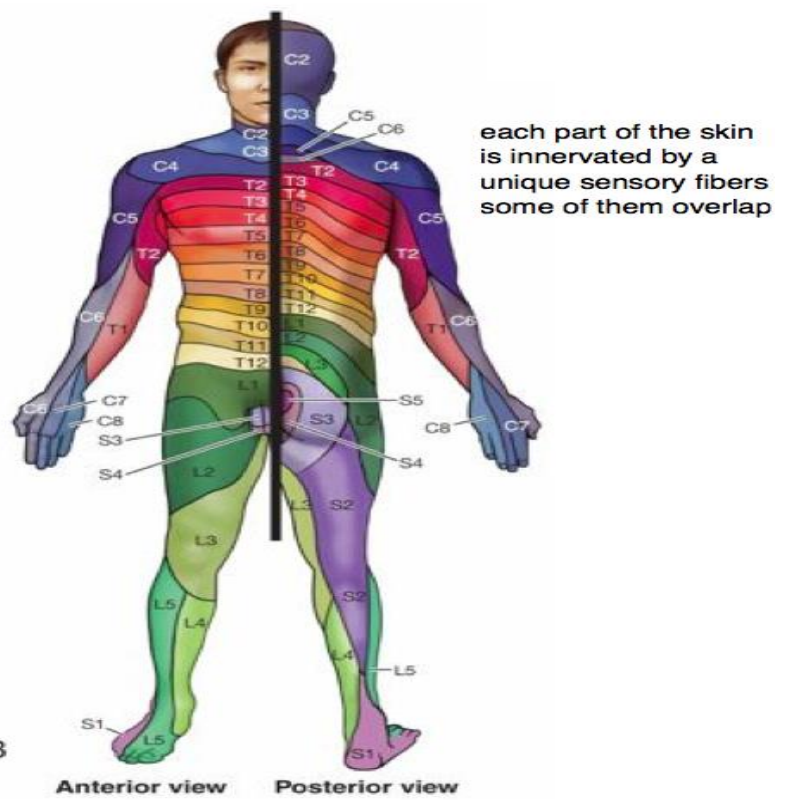
# Dermatomes & Myotomes muscle get multiple spinal cord innervations.

•The unilateral area of skin innervated by the general sensory fibers of a single spinal nerve is called a **dermatome**.

•There is generally overlap from the one dermatome above & below a selected dermatome.

•The unilateral muscle mass receiving innervation from the somatic motor fibers conveyed by a single spinal nerve is a **myotome**.

•Each skeletal muscle is generally innervated by the somatic motor fibers of several spinal nerves; therefore, the muscle myotome will consist of several components.



Dermatome & Myotome

B  
Anterior view      Posterior view  
Dermatome Map

## \* Musculoskeletal Examination:

- He puts his weight on the right leg.
- He is unable to flex his trunk forward. Lateral flexion is fine.

## \* Neurological examination:

- Straight leg-raising is restricted to only 30 degree on the left side. ( the normal is up to 90)
- Sensation: impaired sensation on the outer aspect of the left leg below the knee, lateral side of the dorsum of foot, and lateral 3 toes.
- left ankle reflex is lost. ( the ankle supplied by S1)

## Plain X-Ray

- Electromagnetic radiation to view a non-uniformly composed density.
- Great care needed to avoid unnecessary exposure.
- The disc appears black so we can't actually see it.

## CT-scan

(Computed tomography scan)

- A type of x-ray in which the x-ray source and source detector rotate (slices), high dose of x-ray.
- It provides more information than x-ray, it's useful for diagnosis

## MRI-scan

(Magnetic resonance imaging)

- No risk of x-ray exposure or radiation. Because it uses strong magnetic fields and radio waves.
- **It can give images of soft tissues and organs.**

- **Pain severity:** Degree of illness.
- **Numbness (تنميل):** inability to feel anything or react normally in a particular part of the body due to anesthesia or injury ...etc.
- **Muscle tear:** partial or complete ruptures of the muscle tissue.
- **Calf muscles:** It is a group of muscle that made up of three muscles superficial in the posterior compartment of the lower leg, with Gastrocnemius and Soleus being the main ones.
  - Gastrocnemius
  - Soleus
  - Plantar.
- **Analgesic:** to reduce or relieve pain.
- **dull pain:** a mildly throbbing acute or chronic pain, which may not deter the patient from expected or desired activity.
- **Antipyretic:** to reduce temperature in patient with fever.
- **COX:** Cyclooxygenase.
- **Bulge:** rounded swelling or protuberance that distorts the flat surface.

# Back pain

## ✓ Symptoms:

- Muscle ache. (pain)
- Shooting or stabbing pain.
- Pain that radiates down your leg.
- Limited flexibility or range of motion of the back.
- Inability to stand up straight.

## ✓ Causes:

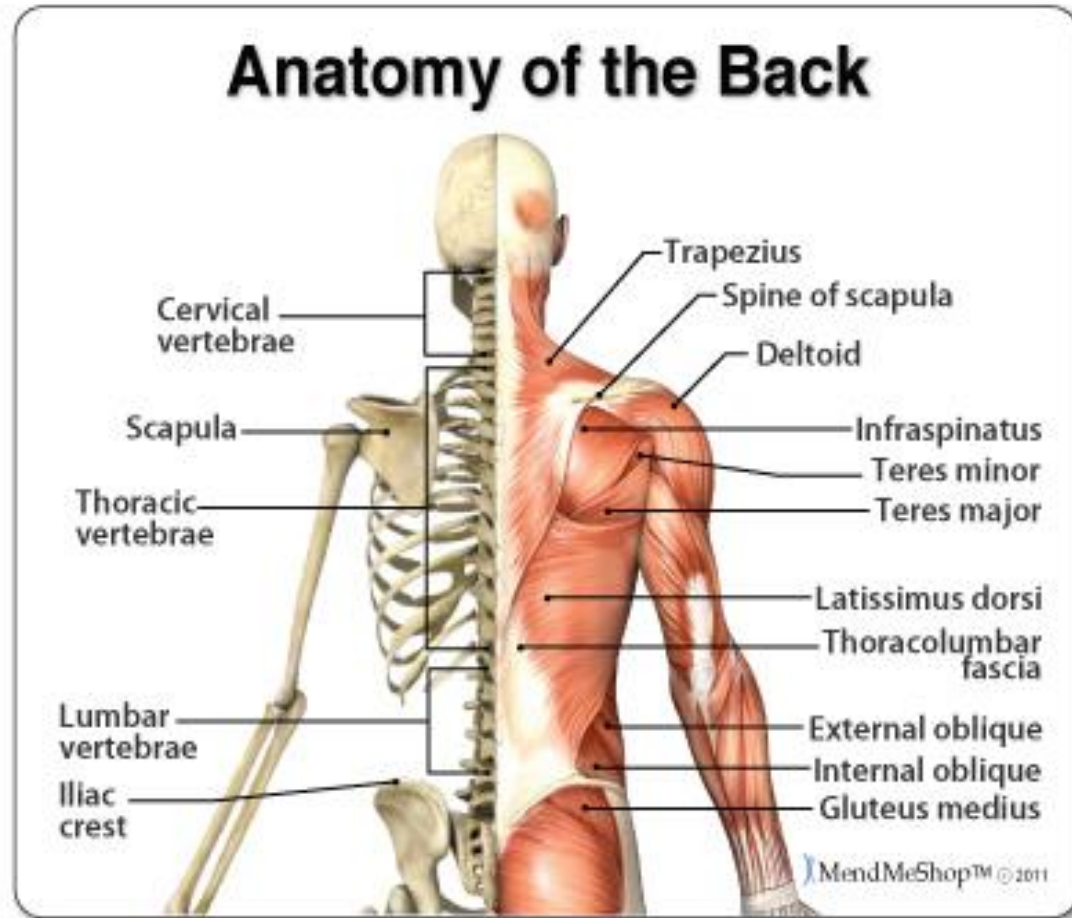
- Muscle or ligament strain. (because of Repeated heavy lifting or a sudden awkward movement)
- ruptured disks.
- Skeletal irregularities (as in scoliosis)
- Osteoporosis.

## ✓ Risk factors:

lack of exercise and improper lifting are often blamed for back pain.

## ✓ Management:

NSAIDs, Muscle relaxants , Physical therapy, Surgery (in few cases)



The function of the lower back

# Prolapse disc

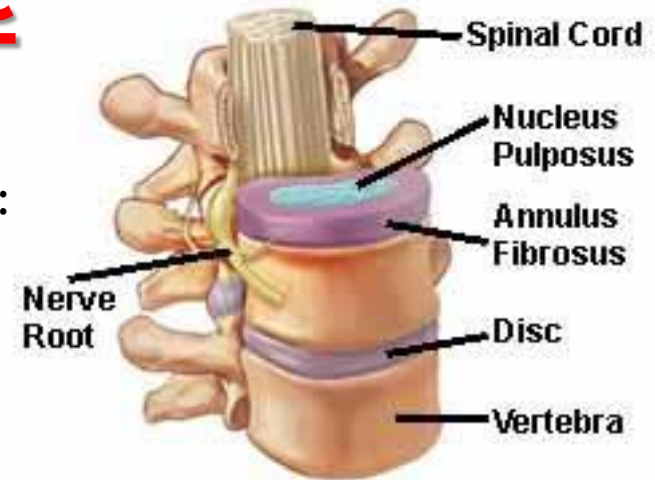
The disks are protective shock-absorbing pads between the bones of the spine ( vertebrae ), Each disc consists of:

I. **Peripheral part:** the annulus fibrosus, composed of fibrocartilage.

I. **Central part:** the nucleus pulposus, a mass of gelatinous material.

❑ Various things may trigger the inner softer central part of the disc to prolapse out such as lifting heavy load and if the slipped disk compress one of the spinal nerves, the patient may experience numbness and pain along the affected nerve.

❑ The fifth lumbar vertebra is by far the most common site. And it could be in any part of the spine.



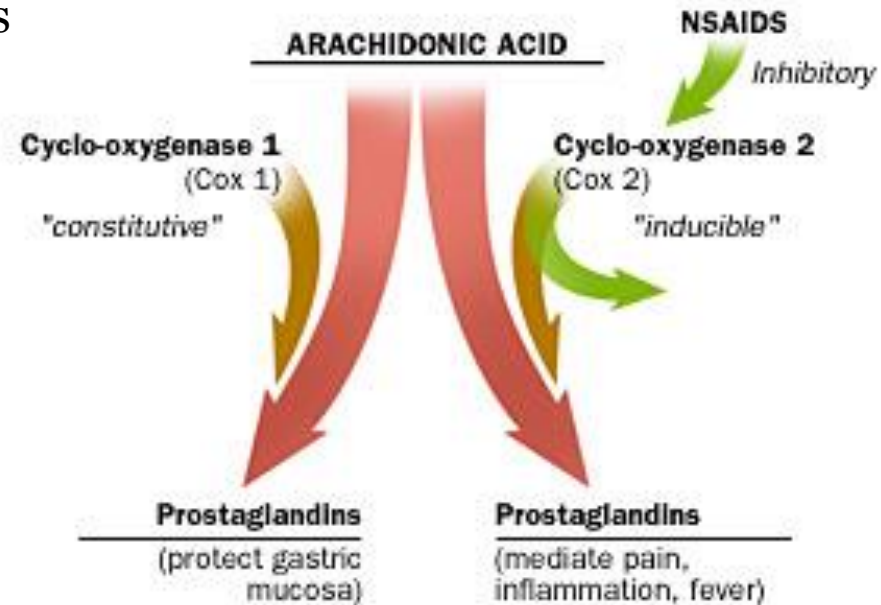
You must check out this lovely video!

# NSAIDS

They inhibit cyclooxygenase 1 and 2 which gives prostaglandins causing pain, fever and inflammation as shown in the figure.

They are classified according to their action on COX-enzymes into non-selective that inhibit both COX-1 & COX-2 & selective that inhibit only COX-2 enzymes.

They have analgesic, antipyretic, anti-platelet & anti-inflammatory effects.



## Paracetamol :

It known also as acetaminophen.

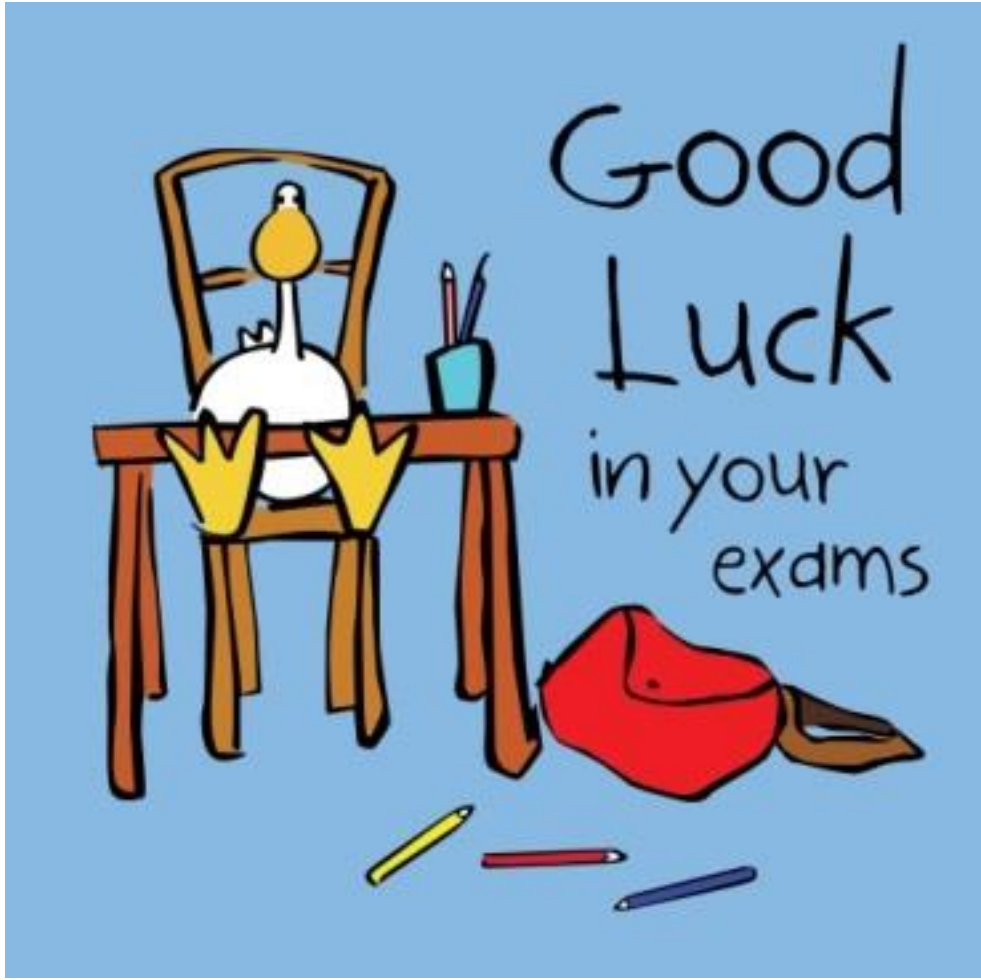
non-selective. it is used as a pain reliever (pain of back, joints and headache) and antipyretic.

It is suitable for patients with:

Peptic or gastric ulcers, bleeding tendency, allergy to aspirin, viral infections especially in children, and During Pregnancy.

Its main adverse effect is raising liver enzymes.





**We hope you enjoyed..**

