physical medicine & rehabilitation&Rheumatology

or physiatry (rehabilitation medicine)

Medical specialty treating chronic disabilities through physical means to help Patients return to a comfortable, productive life despite a medical problem.

Rehabilitation includes

assisting the patient ***to***

compensate for deficits

that cannot be reversed medically

It is prescribed after many types of **injury, illness, or disease**, including

- **Amputations,**
- **orthopedic injuries**
- **arthritis**
- **neurological problems,**
- **spinal cord injuries,**
- **stroke, &**
- **traumatic brain injuries..**

cardiac disease, **cancer**

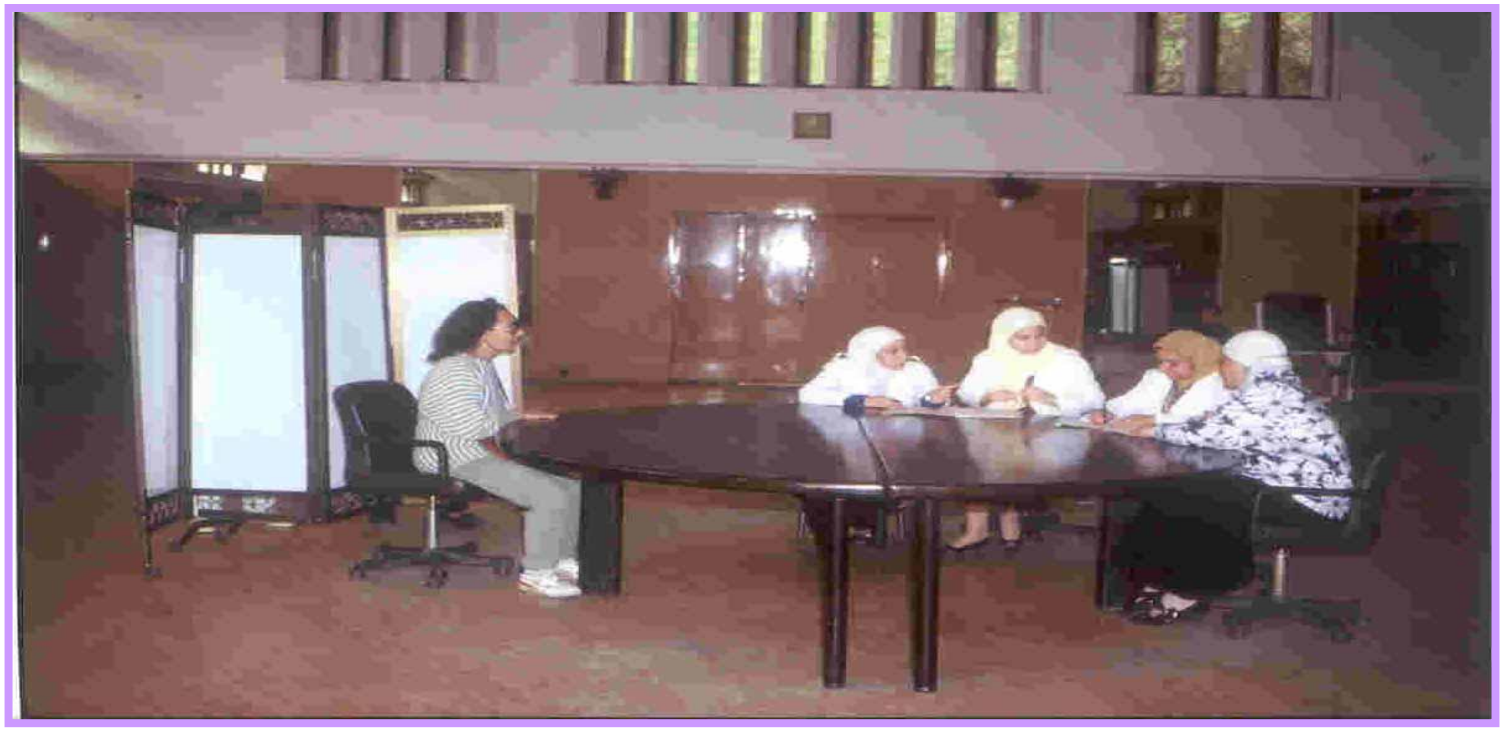
GOALS

Minimize functional deficits

Prevent complications

Use remaining function to maximum

The key to Good Rehabilitation



Team work

- ***Physician specialists head Rehabilitation teams including a***
- ***The physical therapist.***
- ***occupational therapist.***
- ***The social workers.***
- ***Rehabilitation nurse.***
- ***psychological counselor.***
- ***Speech& respiratory therapist .***
- ***Rehabilitation engineer.***
- ***Orthotist &Prosthetist.***

The physical therapist

***The physical therapist assists the patient in functional restoration.**

***Tasks may include the following**

ROM, Muscle Strength, Sitting , Standing , Balance, Coordination , Transfers, and Ambulation, Including wheelchair and Bipedal.

***Progressive Gait training.**

OCCUPATIONAL THERAPISTS

Are responsible for those therapeutic activities associated with patient's daily life, (ADL) from simple Household and Personal Activities to Work and Leisure.

Occupational therapy

helps the patient regain the ability to do normal everyday tasks.

This may be achieved

by restoring old skills *or*

teaching the patient new skills *to adjust to disabilities* ***through adaptive equipment, orthotics, and modification of the patient's home environment.***

Speech therapy

helps the patient

correct speech disorders or restore speech.

Speech therapy may be prescribed to rehabilitate a patient after a ***brain injury, cancer, neuromuscular diseases, stroke, and other injuries/illnesses***

Key terms

Orthotist *— A health care professional who* ***is skilled*** ***in making and fitting orthopedic appliances****.*

Prosthetist *— A health care professional who* ***is skilled*** ***I n making and fitting artificial parts (prosthetics) for the human body.***

social worker

A social worker help to Communicate the patient and family with the outside world.

Evaluation of the patient's

total Living Situation,

Including

Lifestyle,

Family Finances, &

Community resources.

Therapeutic Recreation

Therapeutic Recreation implements various interventions as a form of treatment

- ***to increase physical, cognitive, emotional and social abilities which may have been altered due to personal trauma or disease.***
- ***SPORTS ACTIVITIES***

Vocational Rehabilitation

The Vocational rehabilitation program will assist in training and placing disabled persons in new jobs.

What diagnostic tools are used in physiatry

- medical history, physical examinations,
- X-rays.
- .Electromyography (EMG), nerve conduction studies, and somatosensory and motor – evoked potentials.
- Musculoskeletal ultrasound

is a rapidly developing technique that is also performed by many physiatrists

- ***Physiatrists* utilize**
- ***Medications***
- ***Injections.***
- ***Physical modalities.***
- ***Exercise.***
- ***Education individualized to the patient`s needs.***
- ***Assistive Devices***

الاجهزه What Are Assistive Devices? المساعده

Assistive devices can **help a person function better and be more independent**.

Assistive devices can make daily tasks easier.

Many devices are available to help with activities of daily living (ADLs).

ADLs *are the normal everyday tasks that people do.*

These include:

cooking, eating&house cleaning*.*

also include personal care tasks like

bathing *and* ***using the bathroom****.*

Grip Drink Holder

Hand Held Reacher

Grip Drink Holder

Flexible Sock Aid

Bathroom Wheelchair

Bath Lift

Raised Toilet Seats

Makes for an Easy On and Off the Toilet

Uplift Commode Assist

What Are the Different ?Types of Mobility Aids

Mobility aids help with ***walking or moving*** *from place to place.*

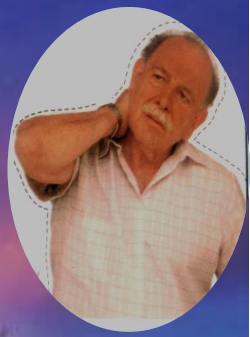
They can help ***prevent falls and improve independence*****.**

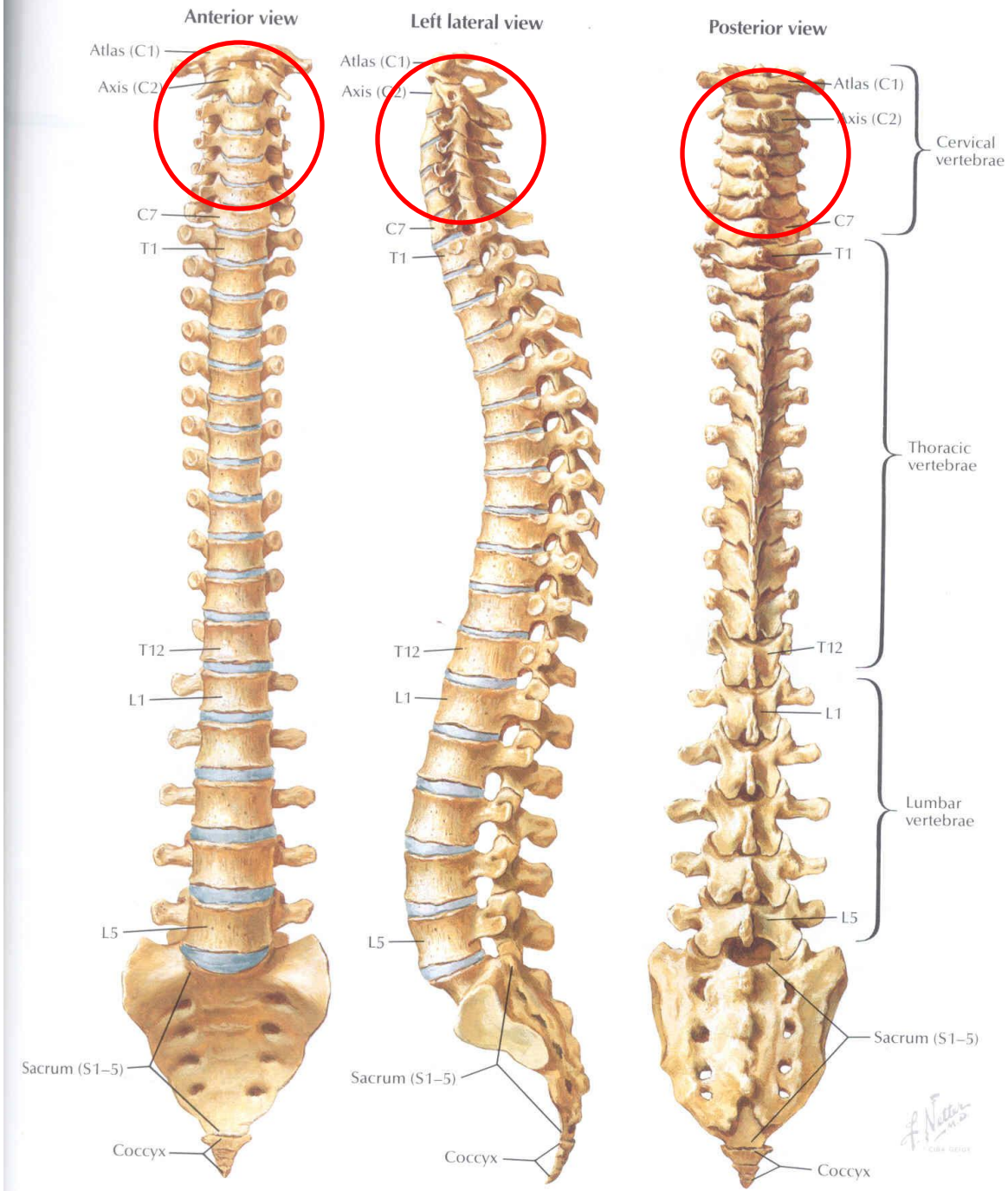
Walkers

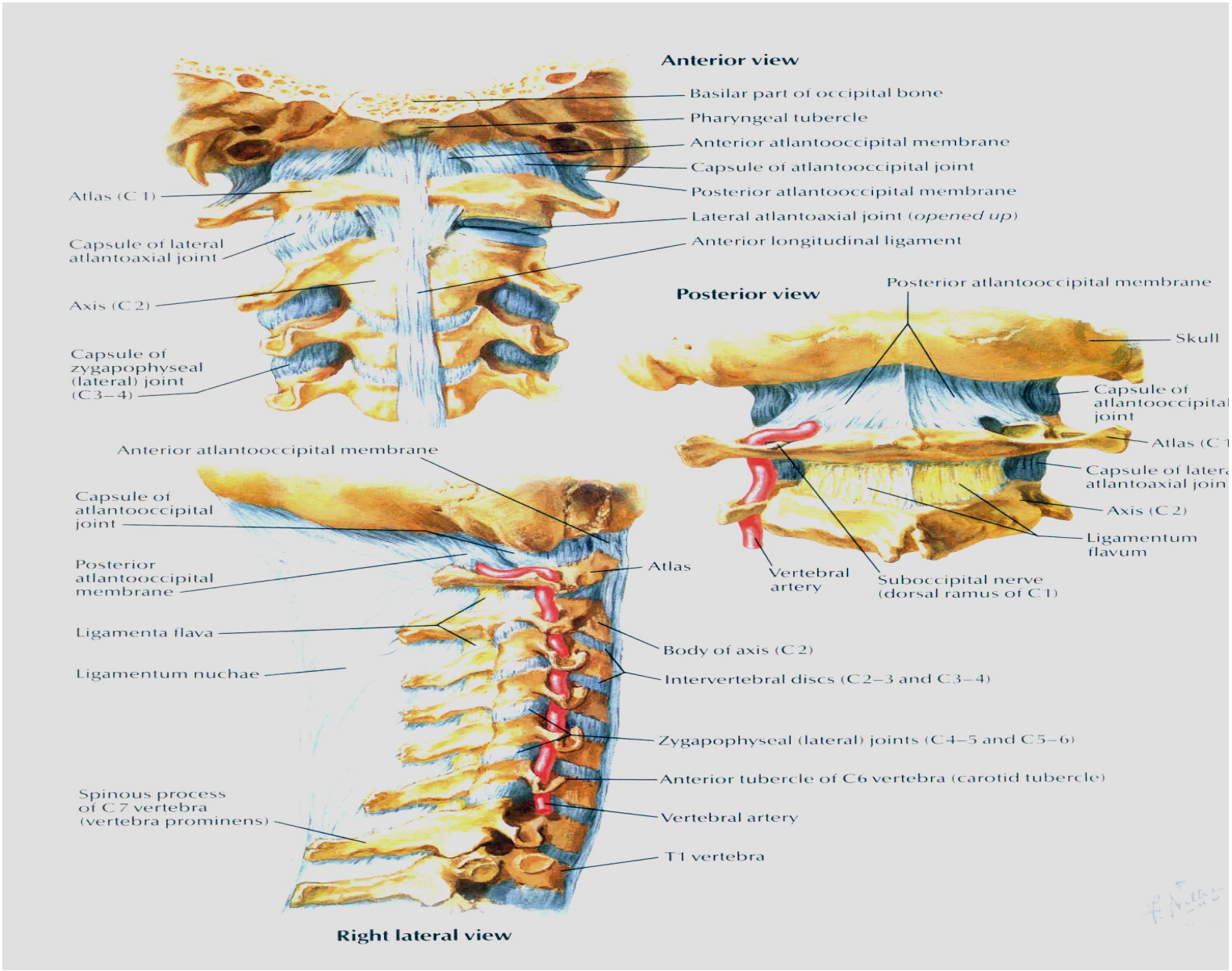
Pediatric

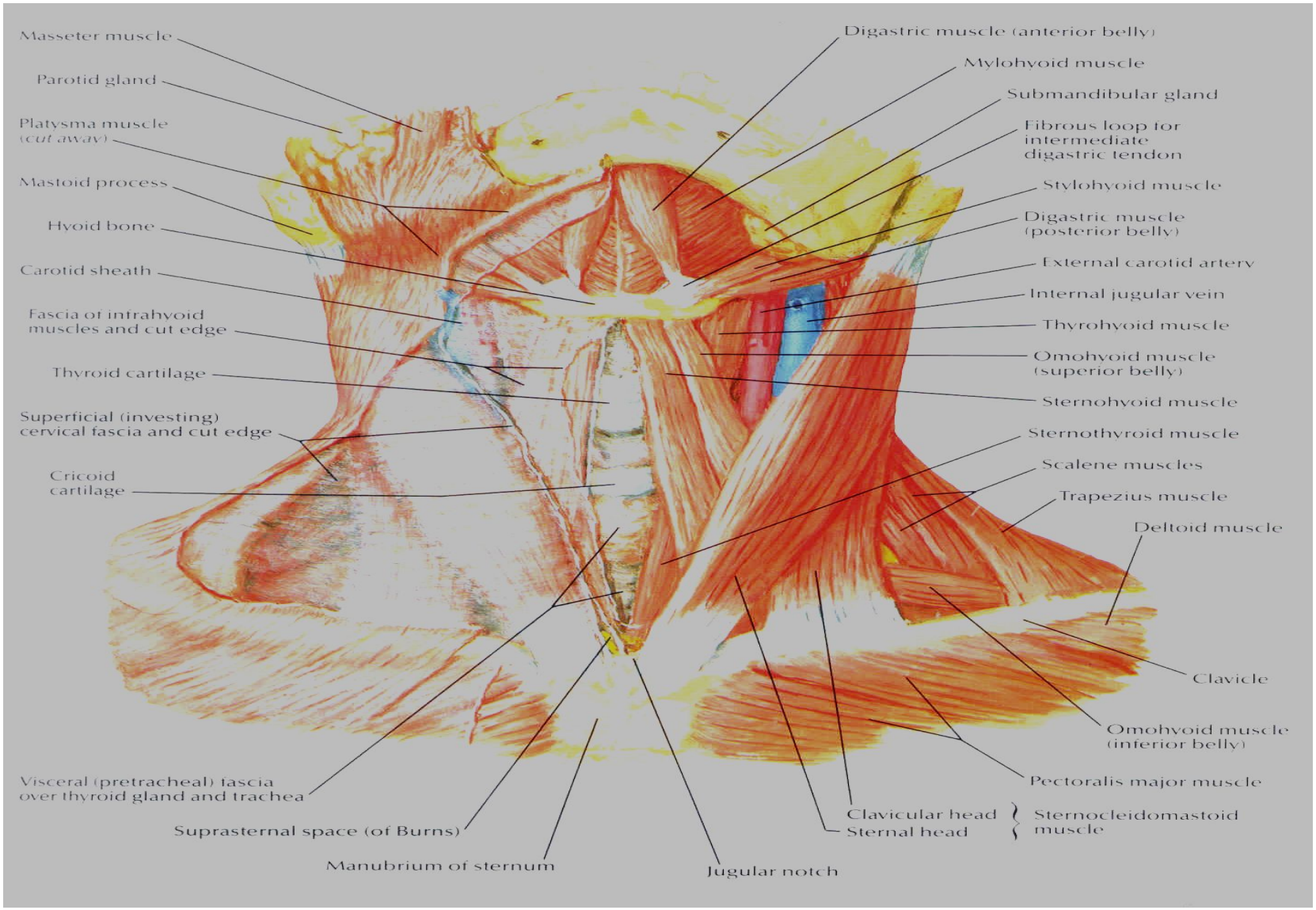
NECK PAIN

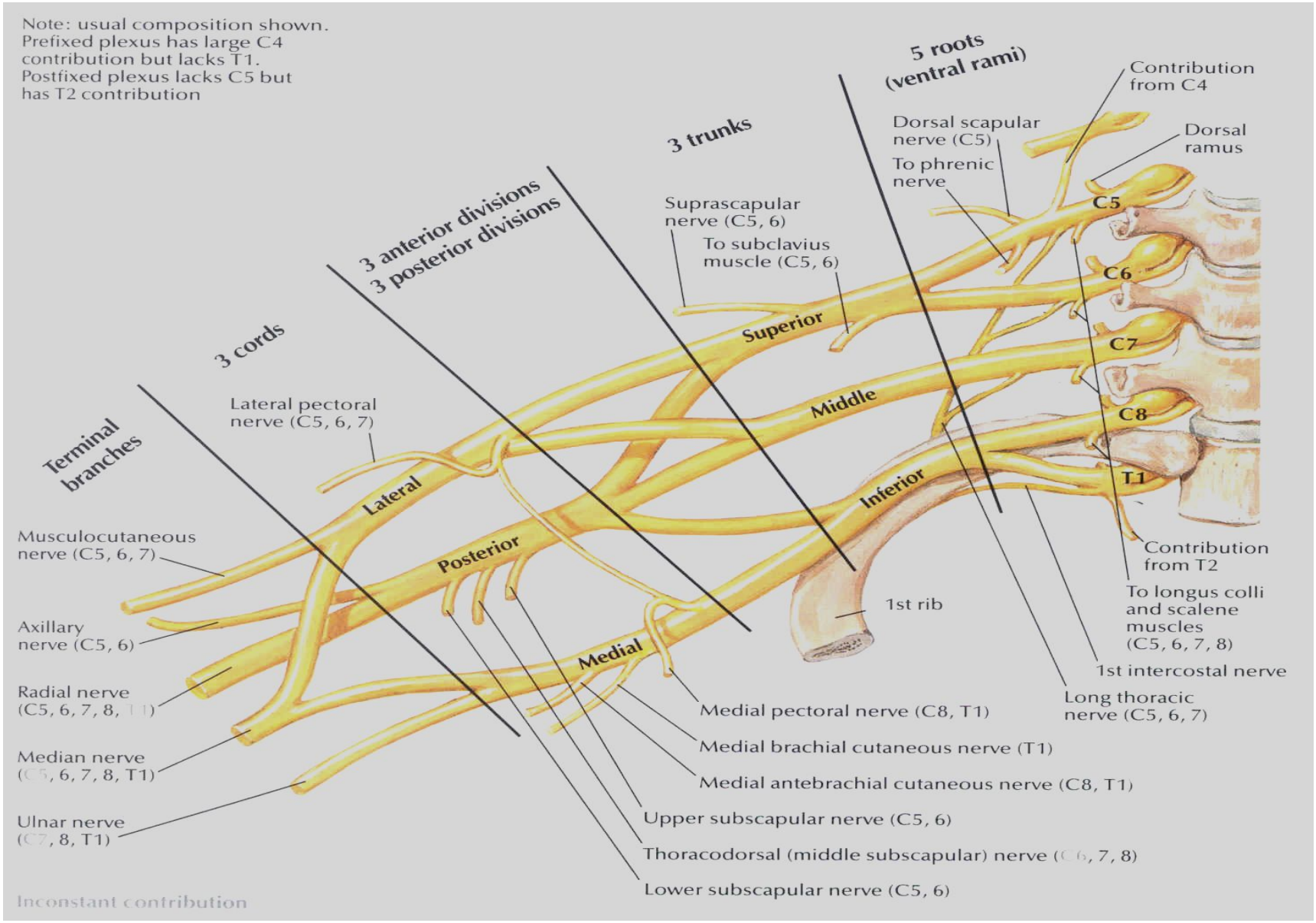
لواءاستاذ دكتور
محمد رضا محمد عوض




Anterior view
Atlas (C1)
Axis (C2)
C7
T1
T12
L1
L5
Sacrum (S1–5)
Coccyx
Left lateral view
Atlas (C1)
Axis (C2)
C7
T1
T12
L1
L5
Sacrum (S1–5)
Coccyx
Posterior view
Atlas (C1)
Axis (C2)
C7
T1
T12
L1
L5
Sacrum (S1–5)
Coccyx
Cervical vertebrae
Thoracic vertebrae
Lumbar vertebrae


Anterior view
Basilar part of occipital bone
Pharyngeal tubercle
Anterior atlantooccipital membrane
Capsule of atlantooccipital joint
Posterior atlantooccipital membrane
Lateral atlantoaxial joint (opened up)
Anterior longitudinal ligament
Atlas (C 1)
Capsule of lateral atlantoaxial joint
Axis (C 2)
Capsule of zygapophyseal (lateral) joint (C3–4)
Posterior view
Posterior atlantooccipital membrane
Skull
Capsule of atlantooccipital joint
Atlas (C 1
Capsule of latera atlantoaxial join
Axis (C 2)
Ligamentum flavum
Vertebral artery
Suboccipital nerve (dorsal ramus of C1)
Anterior atlantooccipital membrane
Capsule of atlantooccipital joint
Posterior atlantooccipital membrane
Atlas
Ligamenta flava
Ligamentum nuchae
Body of axis (C2)
Intervertebral discs (C2–3 and C3–4)
Zygapophyseal (lateral) joints (C4–5 and C5–6)
Anterior tubercle of C6 vertebra (carotid tubercle)
Spinous process of C7 vertebra (vertebra prominens)
Vertebral artery
T1 vertebra
Right lateral view


Masseter muscle
Parotid gland
Platysma muscle (cut away)
Mastoid process
Hyoid bone
Carotid sheath
Fascia of infrahyoid muscles and cut edge
Thyroid cartilage
Superficial (investing) cervical fascia and cut edge
Cricoid cartilage
Visceral (pretracheal) fascia over thyroid gland and trachea
Suprasternal space (of Burns)
Manubrium of sternum
Jugular notch
Digastric muscle (anterior belly)
Mylohyoid muscle
Submandibular gland
Fibrous loop for intermediate digastric tendon
Stylohyoid muscle
Digastric muscle (posterior belly)
External carotid artery
Internal jugular vein
Thyrohyoid muscle
Omohyoid muscle (superior belly)
Sternohyoid muscle
Sternothyroid muscle
Scalene muscles
Trapezius muscle
Deltoid muscle
Clavicle
Omohyoid muscle (inferior belly)
Pectoralis major muscle
Clavicular head
Sternal head
Sternocleidomastoid muscle


Note: usual composition shown.
Prefixed plexus has large C4 contribution but lacks T1.
Postfixed plexus lacks C5 but has T2 contribution
5 roots (ventral rami)
3 trunks
3 anterior divisions
3 posterior divisions
3 cords
Terminal branches
Contribution from C4
Dorsal scapular nerve (C5)
Dorsal ramus
To phrenic nerve
Suprascapular nerve (C5, 6)
To subclavius muscle (C5, 6)
C5
C6
C7
C8
T1
Superior
Middle
Inferior
Lateral pectoral nerve (C5, 6, 7)
Lateral
Posterior
Medial
Musculocutaneous nerve (C5, 6, 7)
Axillary nerve (C5, 6)
Radial nerve (C5, 6, 7, 8, T1)
Median nerve (C5, 6, 7, 8, T1)
Ulnar nerve (C7, 8, T1)
1st rib
Contribution from T2
To longus colli and scalene muscles (C5, 6, 7, 8)
1st intercostal nerve
Long thoracic nerve (C5, 6, 7)
Medial pectoral nerve (C8, T1)
Medial brachial cutaneous nerve (T1)
Medial antebrachial cutaneous nerve (C8, T1)
Upper subscapular nerve (C5, 6)
Thoracodorsal (middle subscapular) nerve (C6, 7, 8)
Lower subscapular nerve (C5, 6)
Inconstant contribution

Anatomy

Head weighing 6:8 1b

7 cervical vertebrae

5 intervertebral discs

12 joints of Luschka

14 apophyseal joints.

System of ligaments

(ant. long, post. long ,lig. flavum , interspinous and ligamentum nuchae)

Muscles

(14 paired anterior lateral & post)

Prevalence

Neck Stiffness

- **25 : 30 % Age 25-29 year**

Up to 50 % Age over 45 year

Neck Stiffness with Brachialgia

- **5 : 10 % Age 25 – 29 year**

25:40 % Age over 50

Musculosketetal Causes

Osteoarthritis

Diffuse idiopathic skeletal hyperstosis

Cervical spondylosis

Disk disease

Rheumatoid arthritis

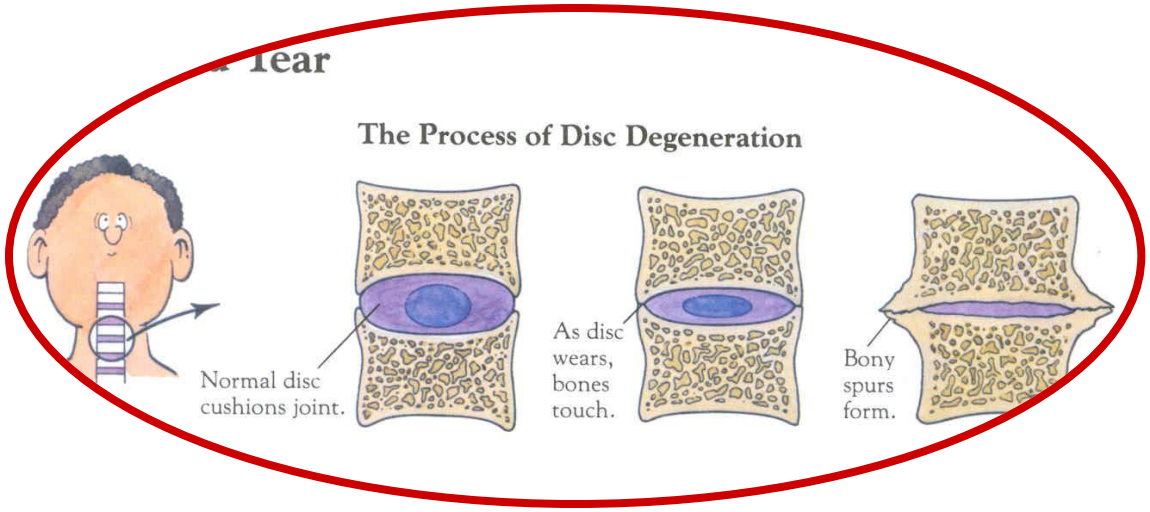
Fracture

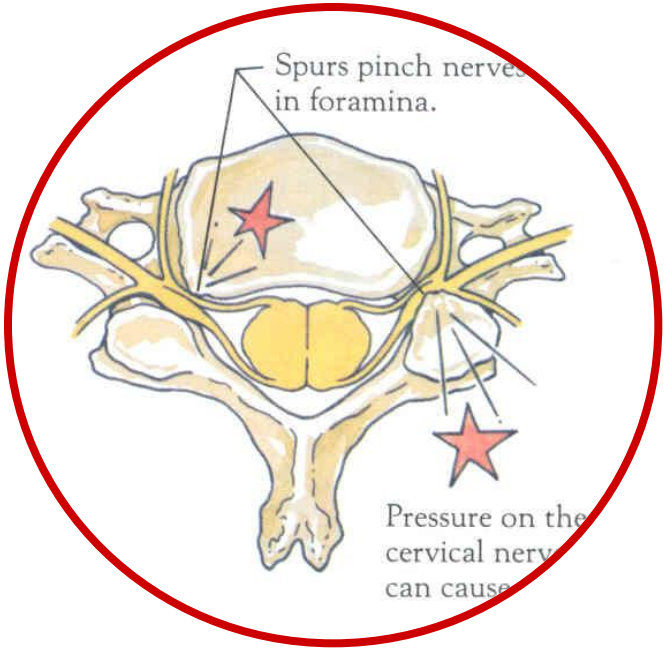
Neoplasm

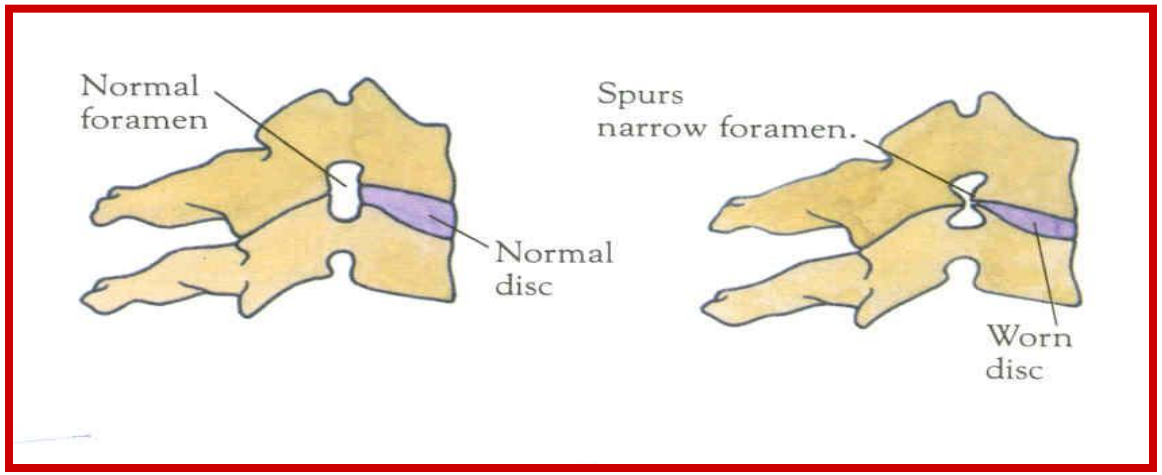
Thoracic outlet syndrome (cervical rib, first rib,and clavicular compression syndromes)

Osteomyelitis

Osteoarthritis







Neurological Causes

Nerve root syndromes

Cervical myelopathy

Neuritis (brachial,occipital)

Torticollis

Meningitis

Cord tumors

Soft tissue and muscular pain

Acute cervical strain

Cumulative trauma, overstrain syndromes

Tendinitis, bursitis

Postural disorders

Fibrositis, fibromyalgia, and myofascial syndrome

Pharyngeal infection

whiplash injury or neck sprain injury

The term “whiplash,” used to describe an injury mechanism of

sudden hyperextension (backward motion) followed by hyperflexion (forward motion) of the neck.

The injury mechanism is **commonly seen in sports and auto accidents**

The most common **whiplash symptoms** are neck pain, neck stiffness, headache, shoulder pain, back pain, and difficulties with concentration and mmemory. Dizziness, buzzing in the ears, insomnia, depression, and anxiety also are reported

Referred Pain

Heart and coronary artery disease

Apex of lung: Pancoast's tumor

Migraine

Muscle tension and myofascial pain

TMJ syndrome

Diaphragm, gallbladder, pancreas, hiatus hernia

Clinical Evaluation

History

Physical Examination

Radiologic Evaluation

Electro - Diagnosis

(assist in confirming the clinical formulation)

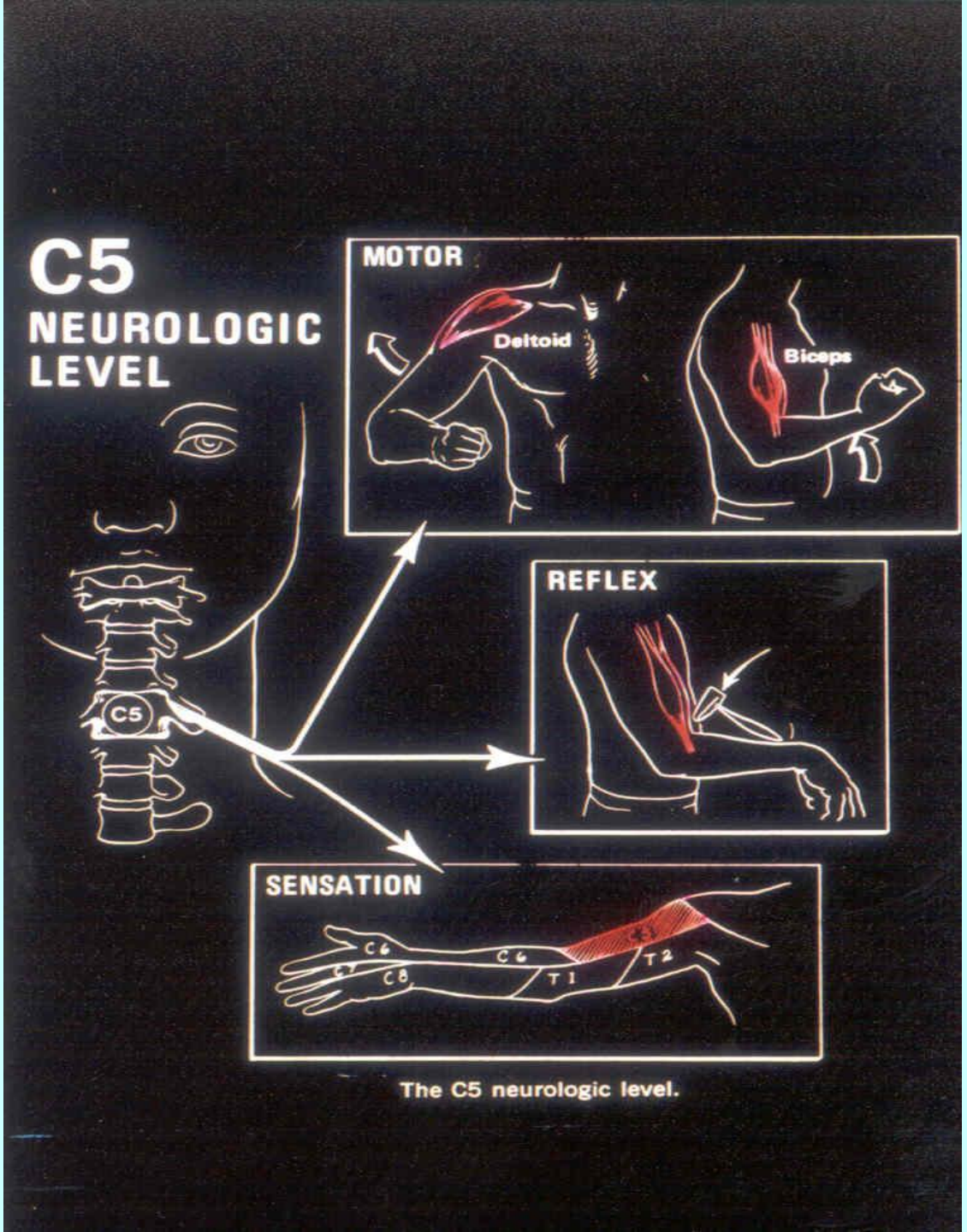
Examination of Related Area

Shoulder

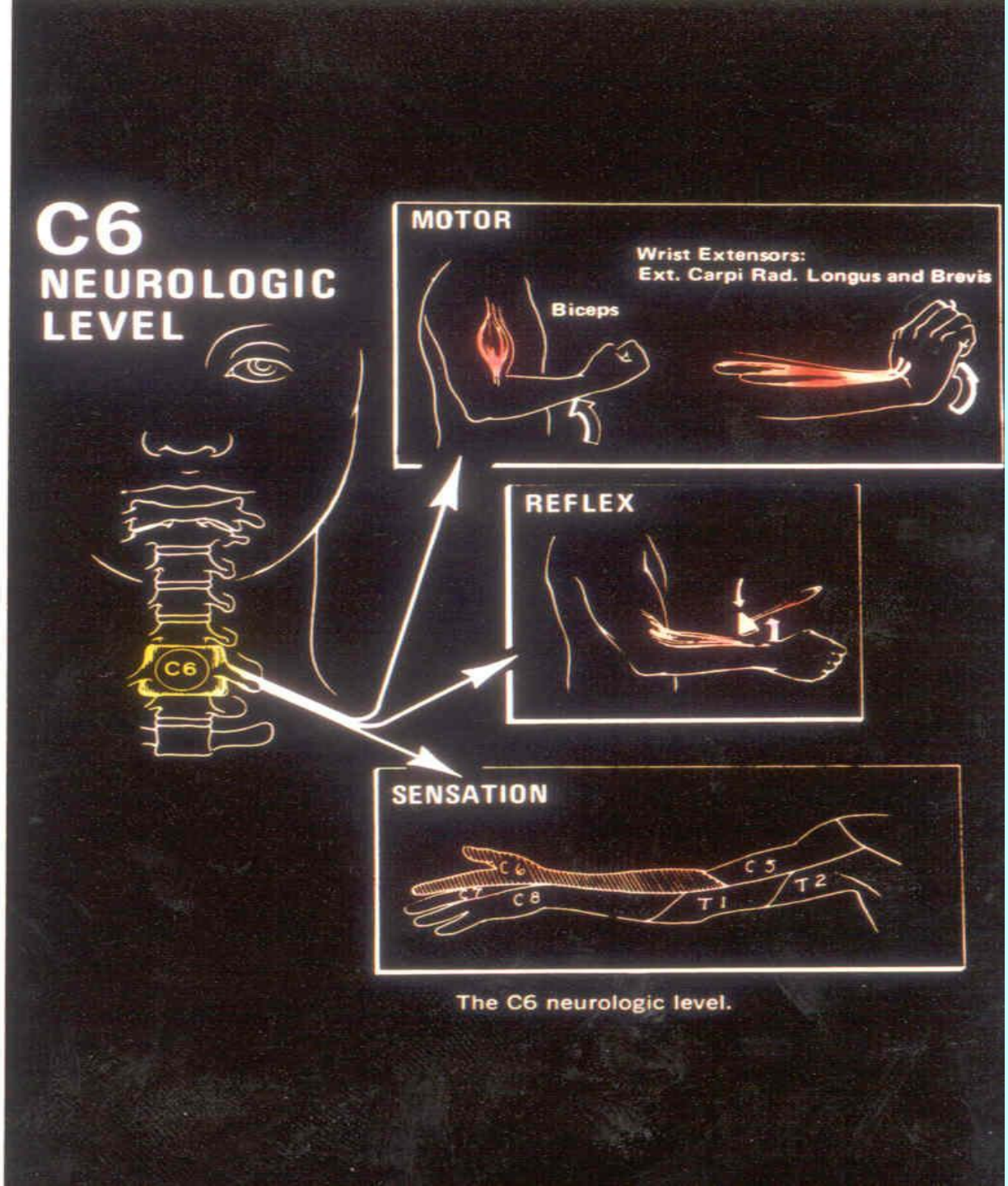
(Rotator Cuff Tendenitis – capsulitis)

TMJ

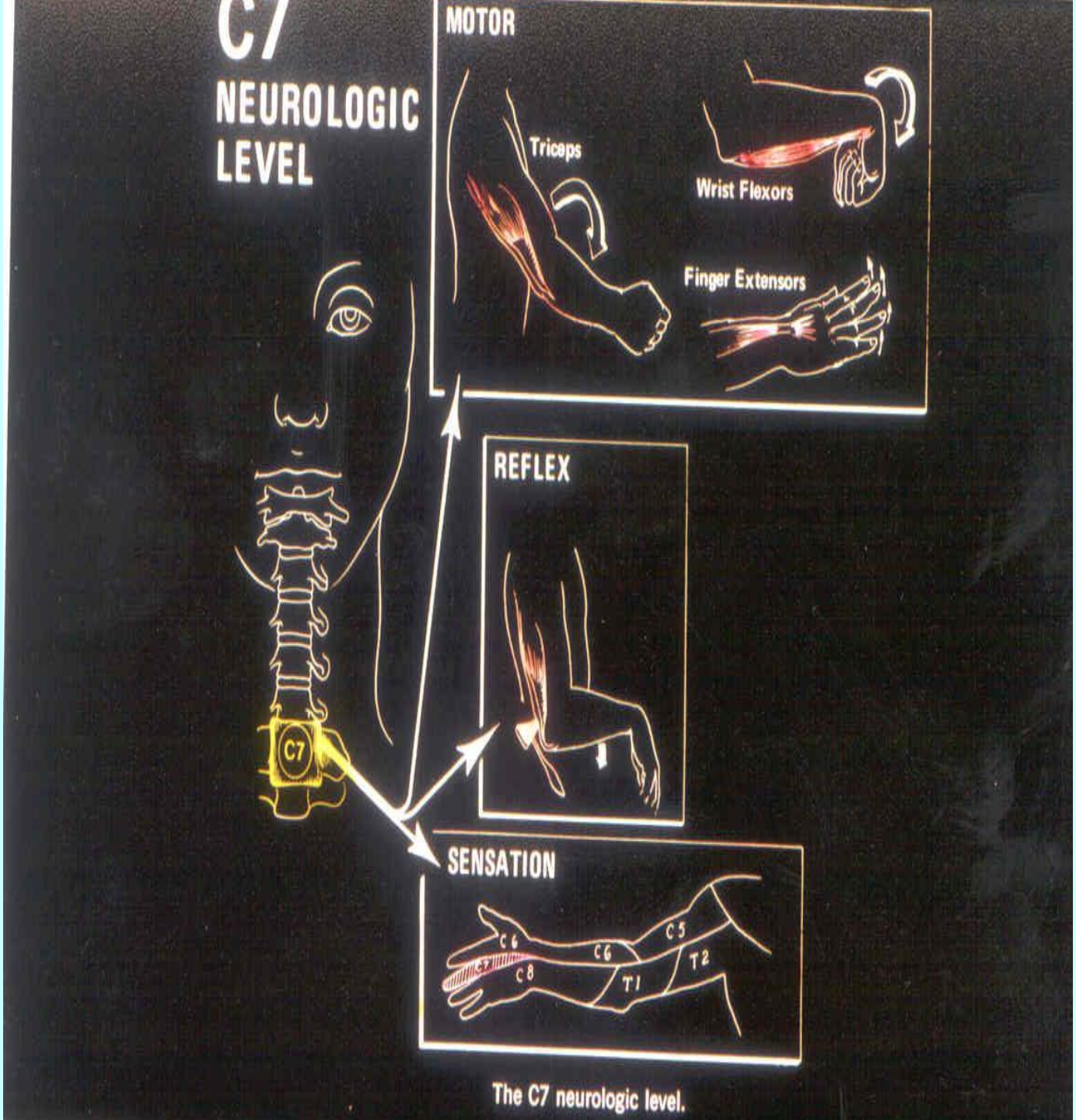
Upper Limb



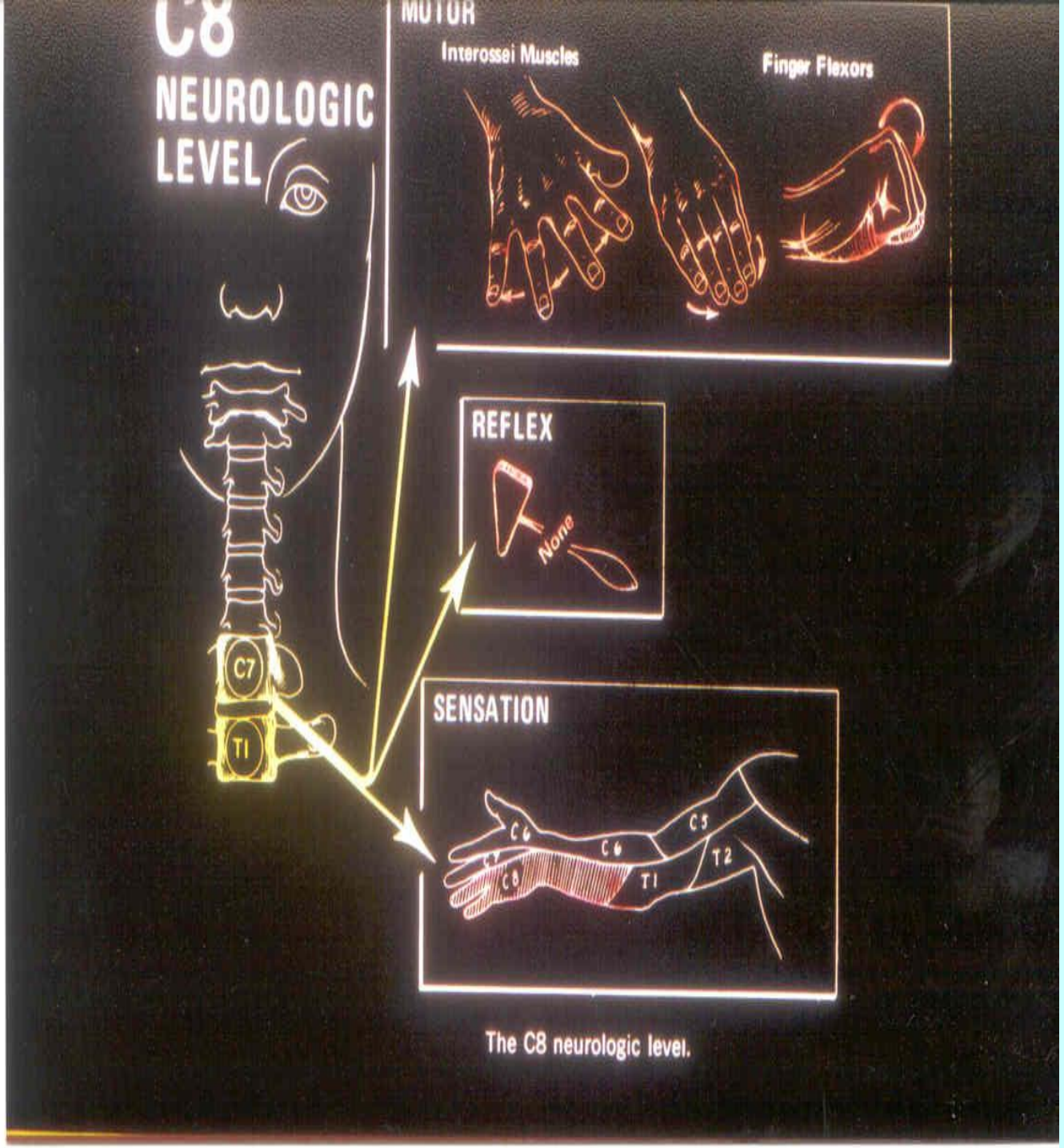
The C5 neurologic level.



The C6 neurologic level.



The C7 neurologic level.



The C8 neurologic level.

Cervical Nerve Roots and Their Corresponding Sensory and Motor Disturbances

	NERVE ROOT AFFECTED	PHYSICAL FINDINGS
C4-5	C5	• Deltoid muscle weakness • Does not usually cause numbness or tingling • Can cause shoulder pain
C5-6	C6	• Biceps weakness • Numbness and tingling along with pain can radiate to thumb side of hand • Most common level for a cervical disc herniation to occur
C6-7	C7	• Triceps and finger extensor weakness • Numbness and tingling along with pain can radiate down triceps and into middle finger • Second most common level for a cervical disc herniation to occur
C7-T1	C8	• Can cause weakness with handgrip • Numbness and tingling and pain can radiate down arm to small finger

Management

AIM

Relief of pain and stiffness in the neck and arms

Restore the function of neck and related structures .

Avoid pain recurrence

PATIENT EDUCATION

various types of initial neck pain treatment with

* analgesics, sedatives, antihistamines, nonsteroid anti-inflammatory drugs,

*antidepressive drugs, , muscle relaxants, and

* local anesthetic injections as well as

PHYSICAL THEARAPY

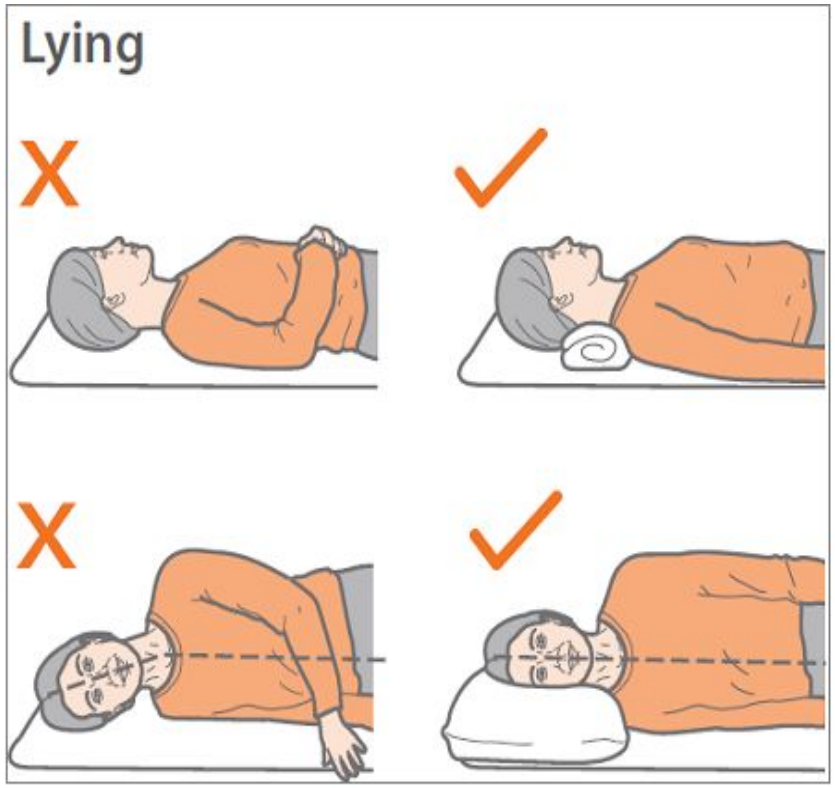
, neck collar immobilization,.

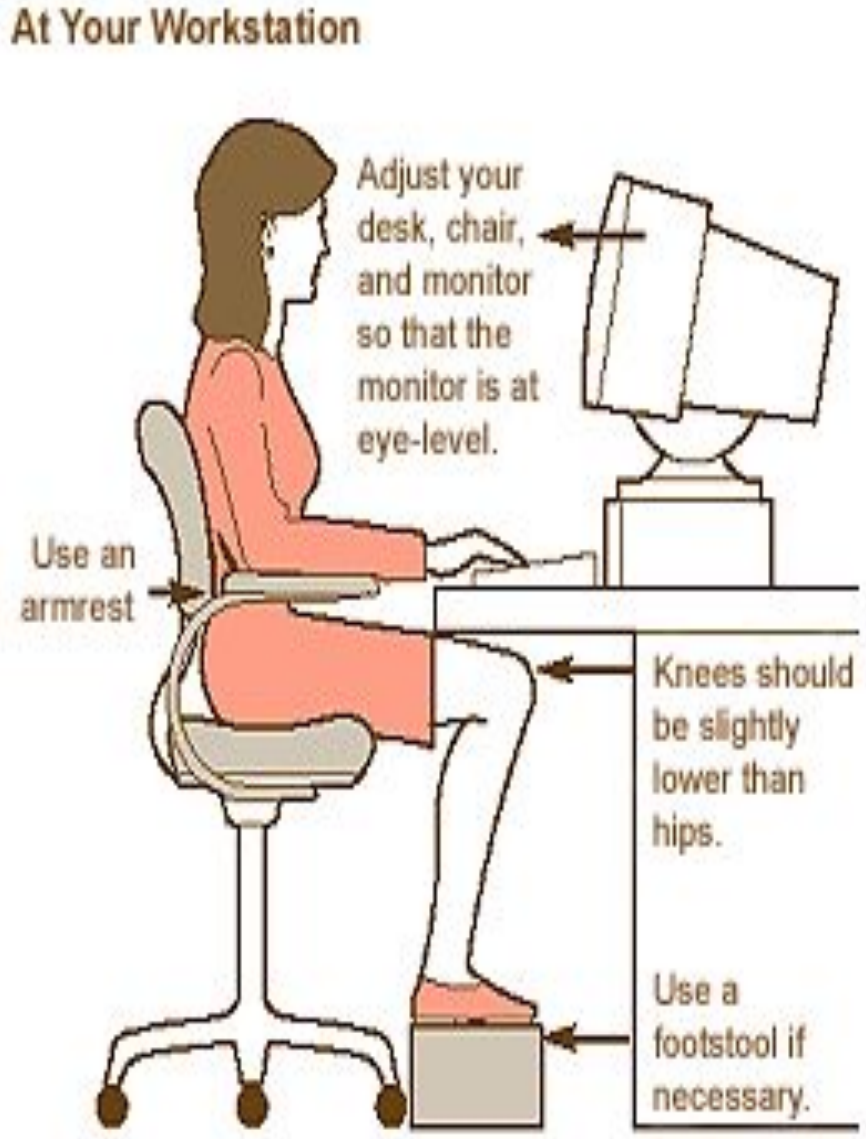
***HEAT ,*ice**

MASSAGE

ACUPUNCTURE

MANIPULATION


Lying
X
X


At Your Workstation
Adjust your desk, chair, and monitor so that the monitor is at eye-level.
Use an armrest
Knees should be slightly lower than hips.
Use a footstool if necessary.

LUMBAR DISC PROLAPSE

REDA

LBP: Statistics

- **Second** only to the common cold in frequency among adult ailments
- **Fifth** most common reason for an office visit

80% of all people experience low back pain at some time during Their lives

Lifetime **recurrence rate 85%**

على المستوى المحلى

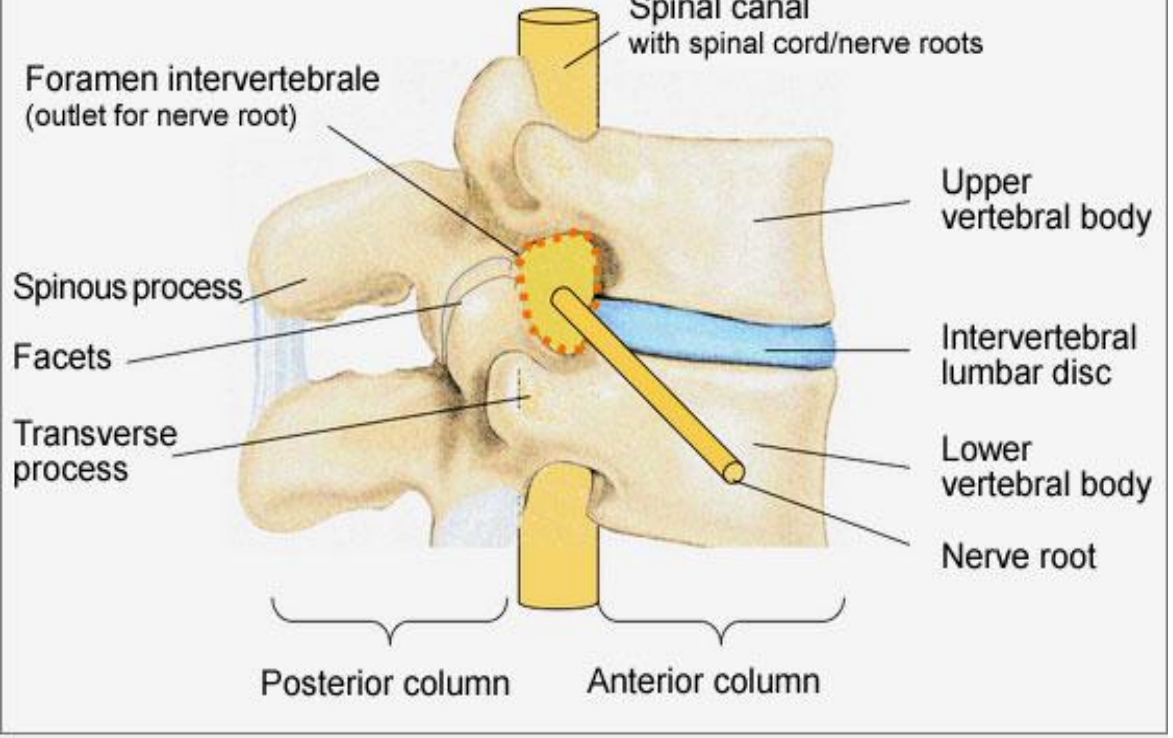
44 % من عمال الحديد والصلب

34 % من سائقى أتوبيس النقل العام .

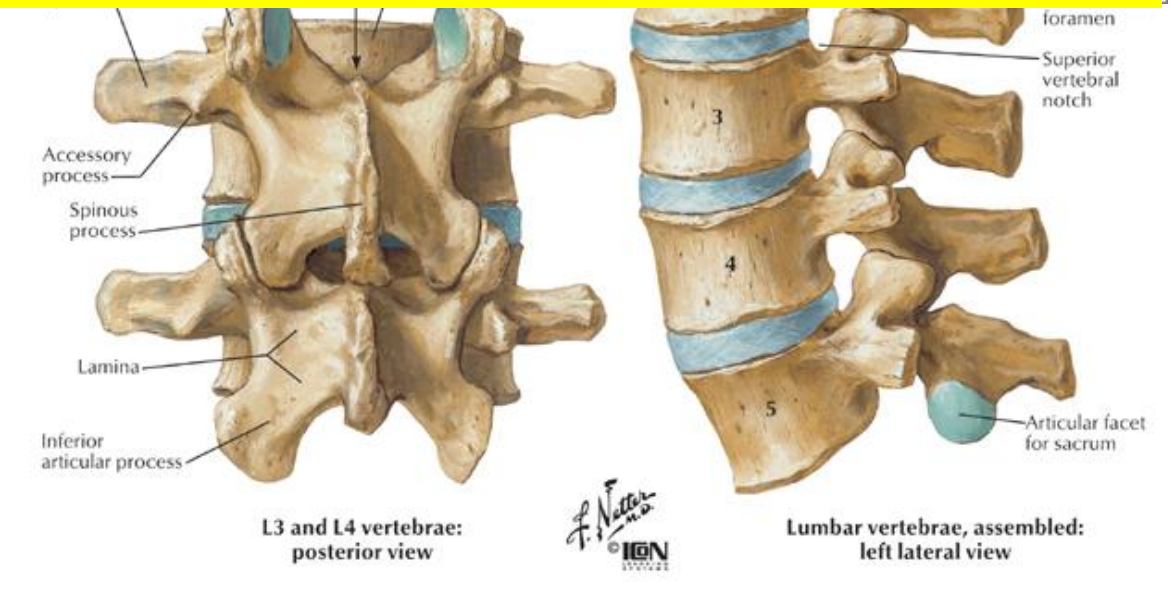
32 % من سائقى القطارات .

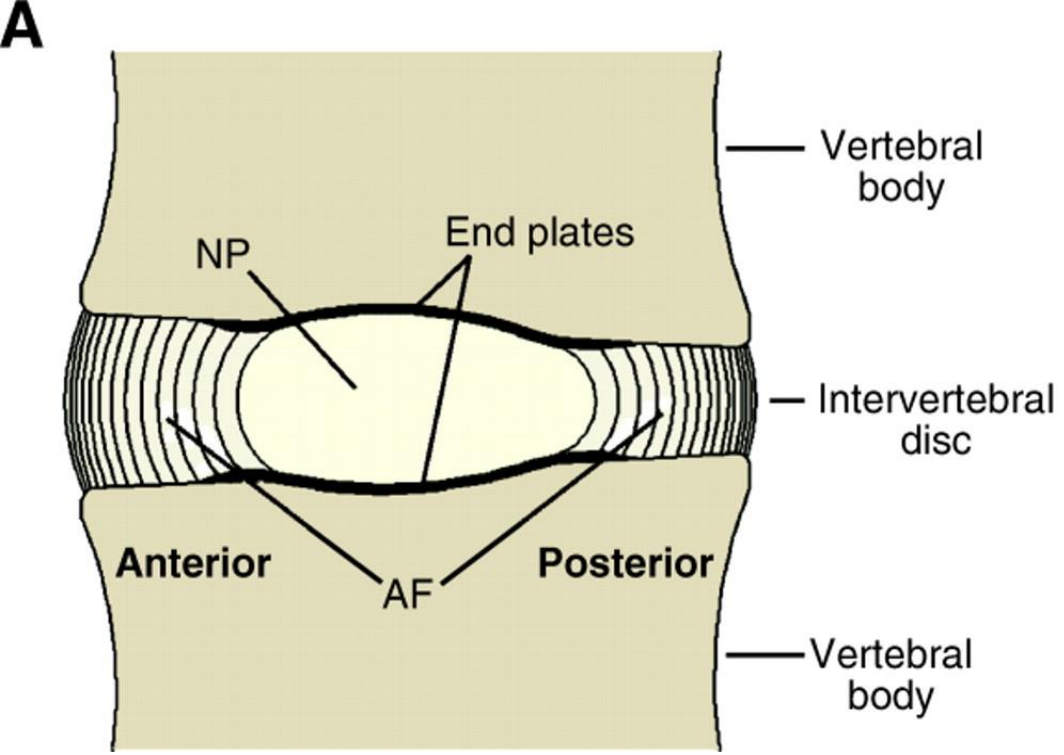
30 % من العاملين بالتمريض .

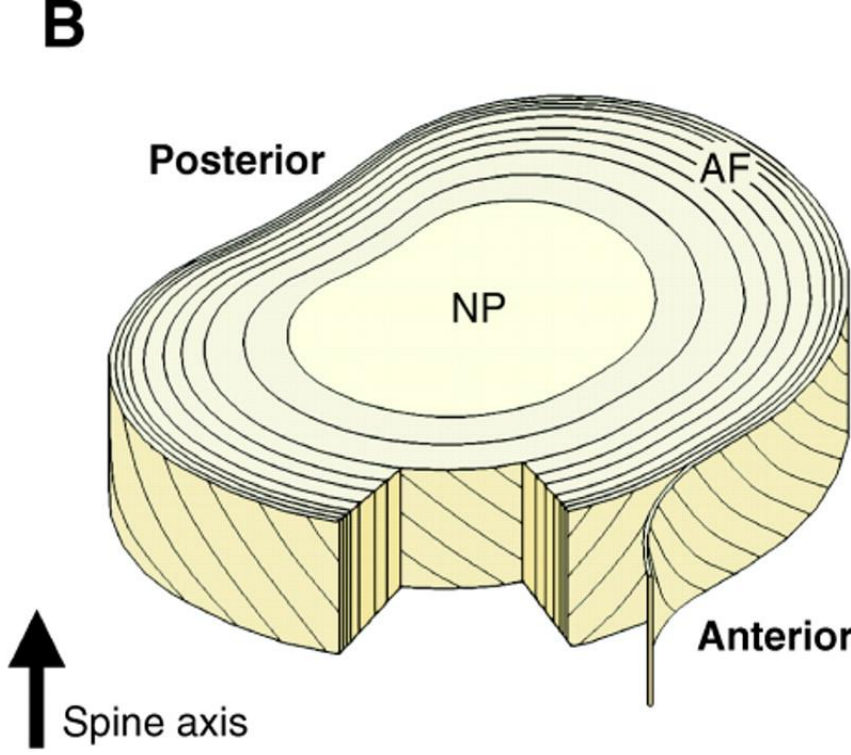
28 % من أطباء الأسنان .



lumbar spine normal motion segment





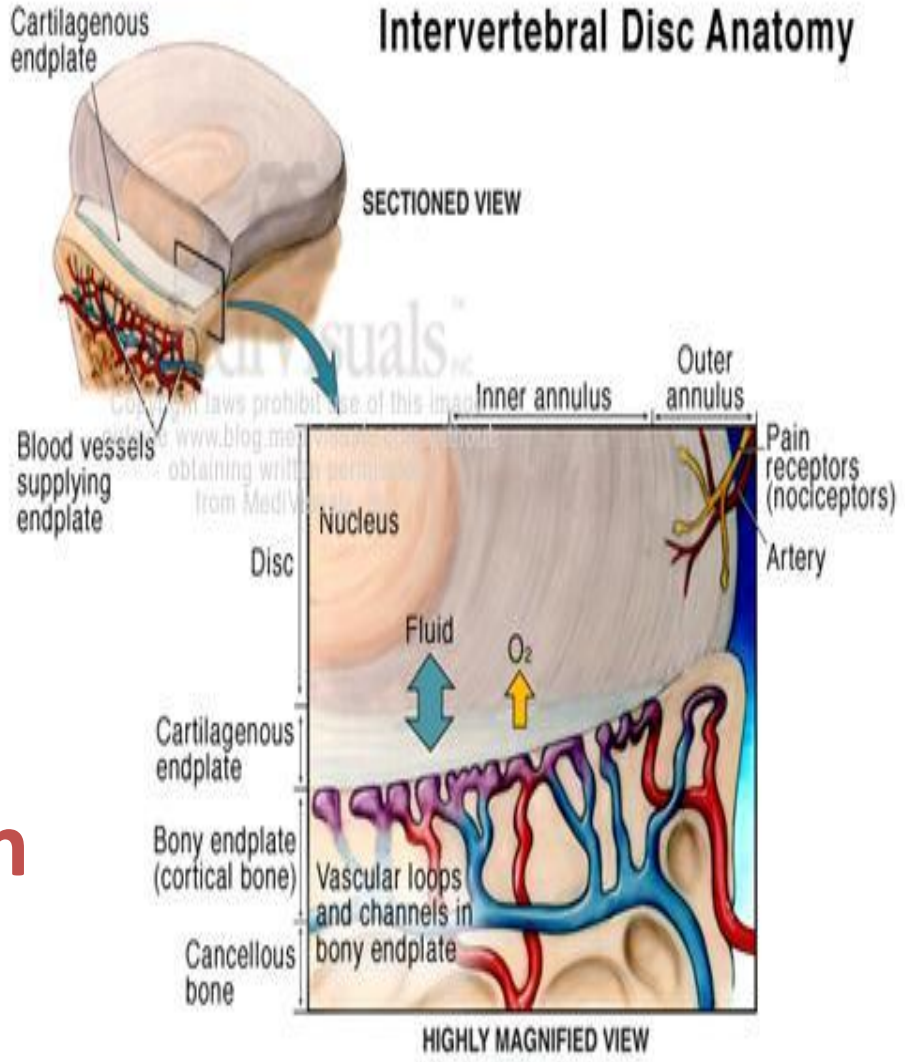


The disc is made up of three basic structures:

the **nucleus pulposus**,
the **annulus fibrosus** and
the **vertebral end-plates**,

Nutrition

The disc is the largest avascular structure **in the human body**.



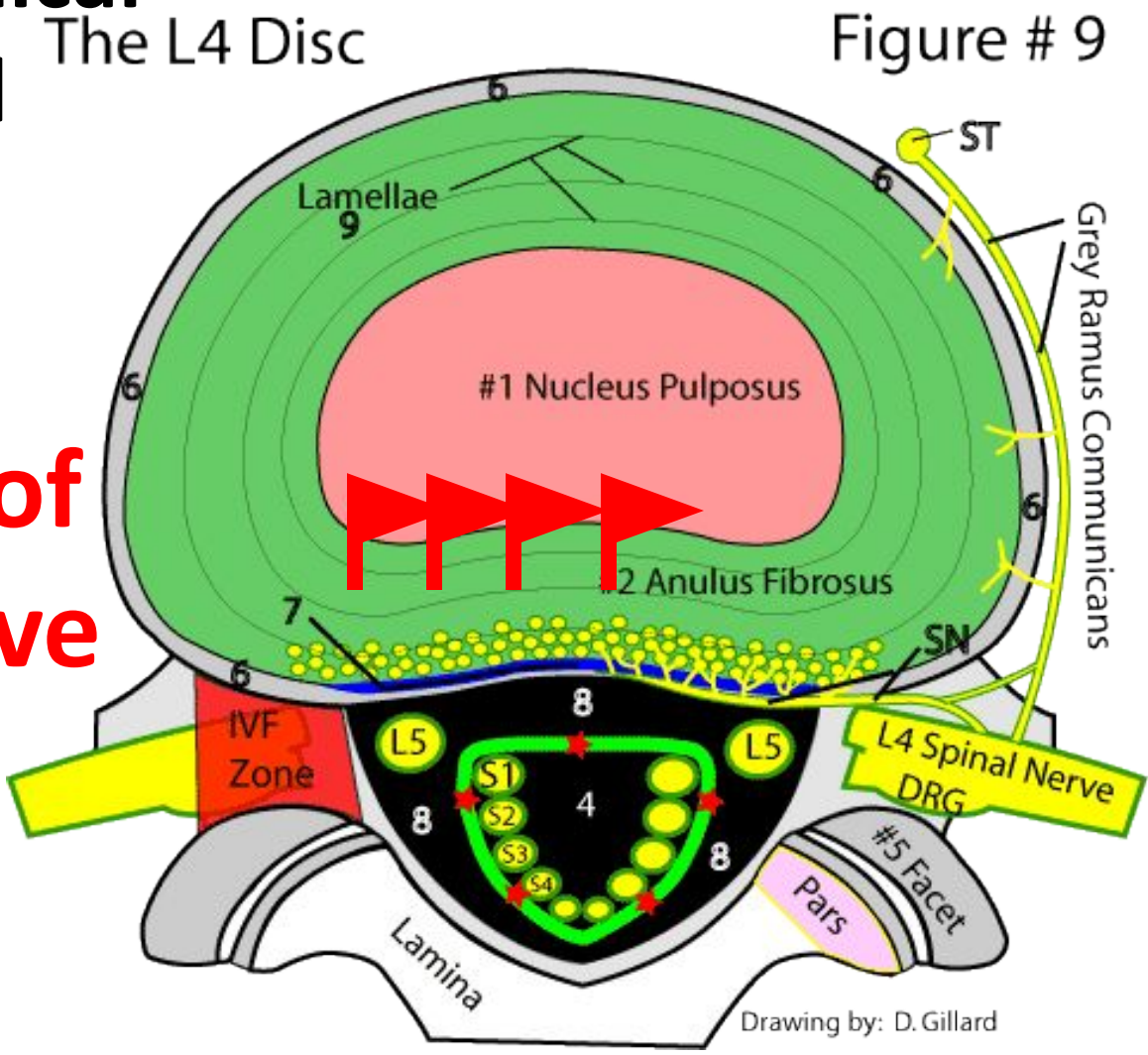
<u>Nutrients for the disc</u> are found within tiny **capillary beds that are in the <u>subchondral bone</u>,** just above the vertebral end-plates

Disc innervation

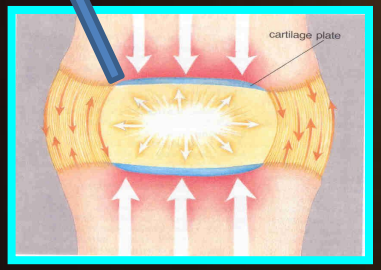
1981 Australian clinical anatomist and physician

Nikoli Bogduk

The outer 1/3 of annulus receive innervation with small Afferents.



interadiscal pressure



Body Positions Affecting the Spine

Disc Pressure

Intradiscal Pressure (kg)

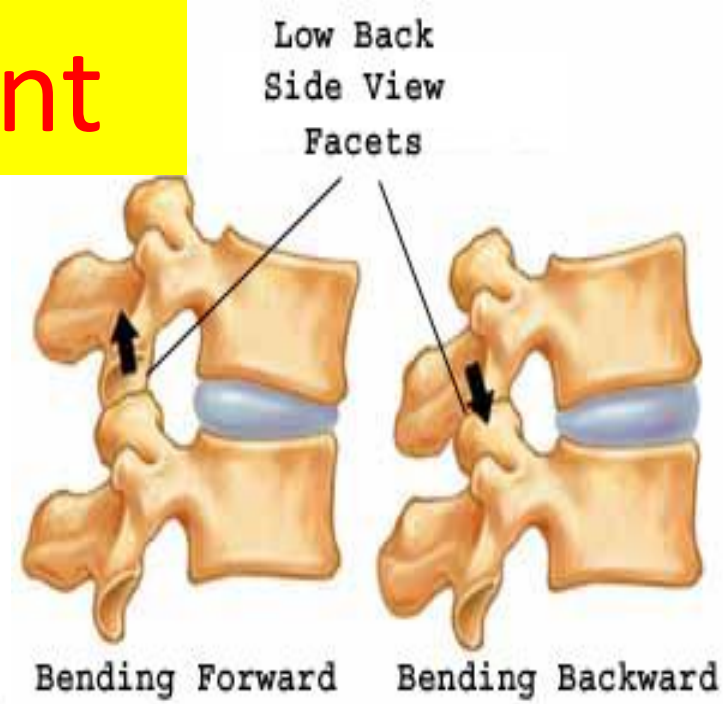
275
250
225
200
175
150
125
100
75
50
25
0

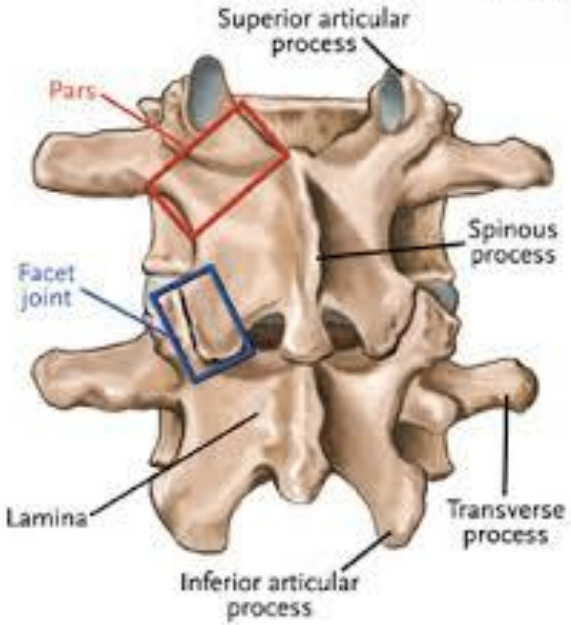
25
75
100
150
220
140
185
275

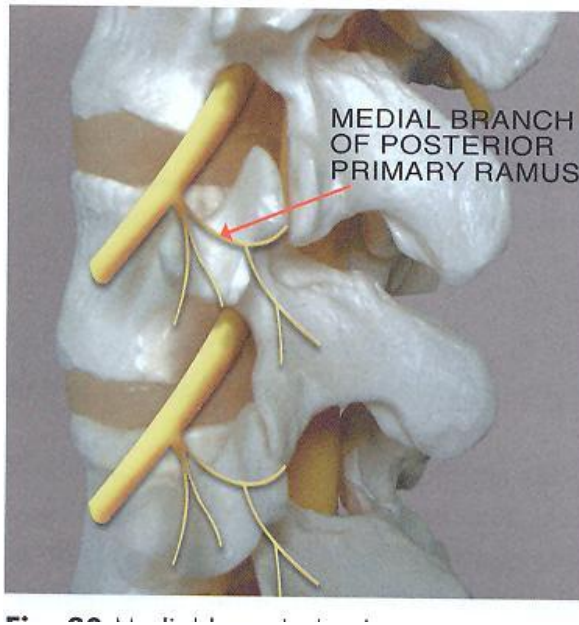
facet joint

is a synovial joint between the superior articular process, of one vertebra and the inferior articular process of the vertebra directly above it.

These joints are in constant motion, providing the spine with both the stability and flexibility







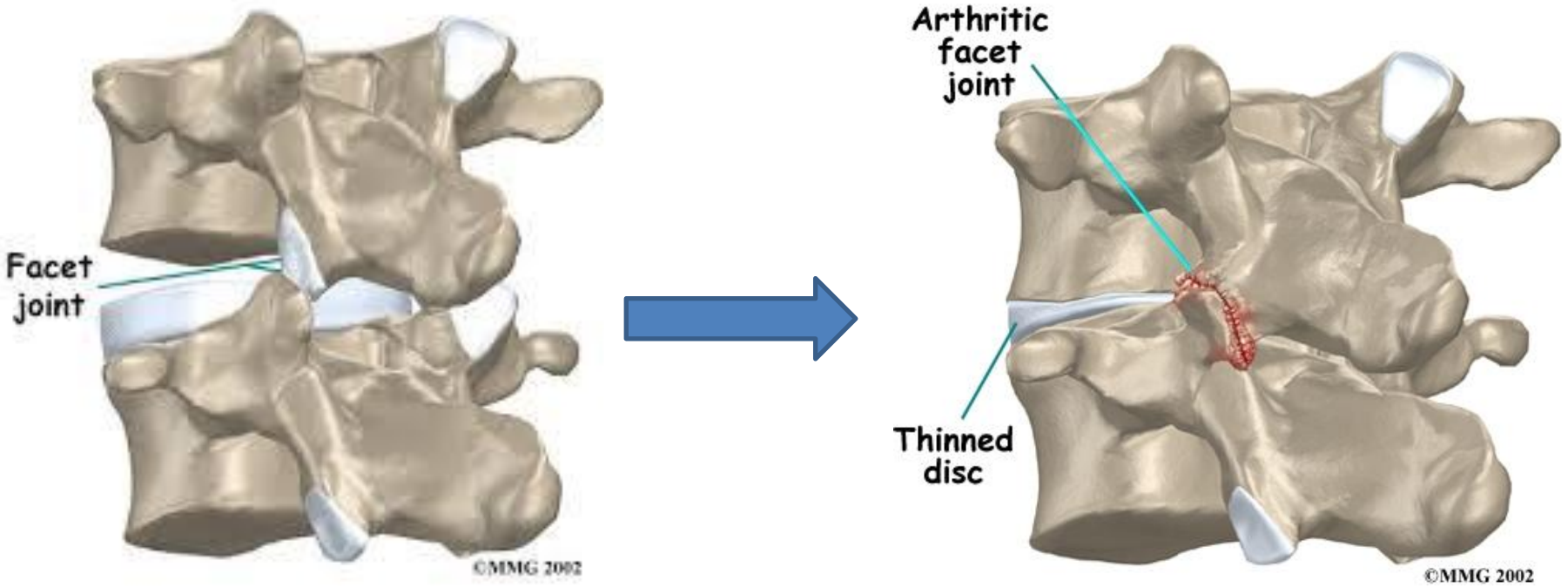
Degeneration

Before age 40 approximately **25%.** Beyond age 40, more than **60%** of people show evidence of disc degeneration at one or more levels on a MRI.

the nucleus pulposus begins to dehydrate and the concentration of proteoglycans in the matrix decreases, thus limiting the ability of the disc to absorb shock.

The anulus fibrosus also becomes weaker with age and has an increased risk of tearing.

In addition**, the cartilage end plates** begin thinning, fissures begin to form, and there is sclerosis of the subchondral bone



As the disc dehydrates

the disc loose ability to support the axial load of the body; this causes a 'weight bearing shift' from the nucleus, outward, onto facet joints .

Recommendation

Clinicians should conduct a focused

HISTORY&

PHYSICAL EXAMINATION

to help place patients with low BP

into 1 of 3 broad categories:

Diagnostic triage

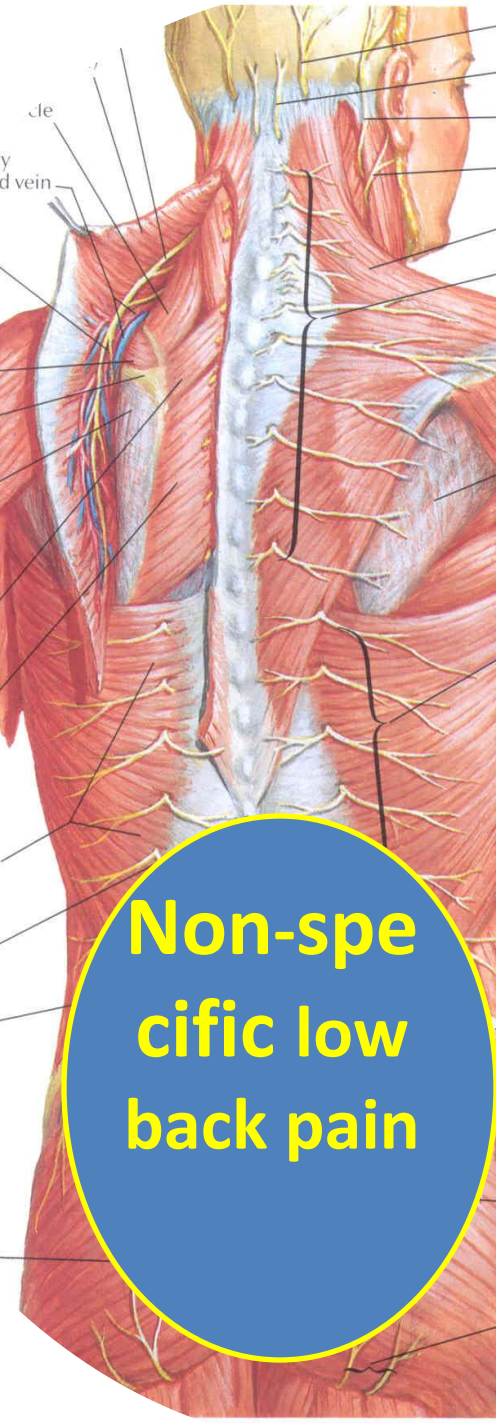
Nonspecific low back pain. 85%

back pain potentially associated with

Radiculopathy or spinal stenosis 7%

or back pain potentially associated with another

Specific spinal causes 8%



Pain, muscle tension, or stiffness that occurs between the(rib cage and the inferior gluteal folds), with or without (sciatica)&, has no identifiable cause

Degenerative changes on lumbar imaging are usually considered nonspecific, as they correlate poorly with symptoms

specific disorder,(8%)

such as

cancer

compression fracture

spinal infection

Ankylosing sp

symptomatic

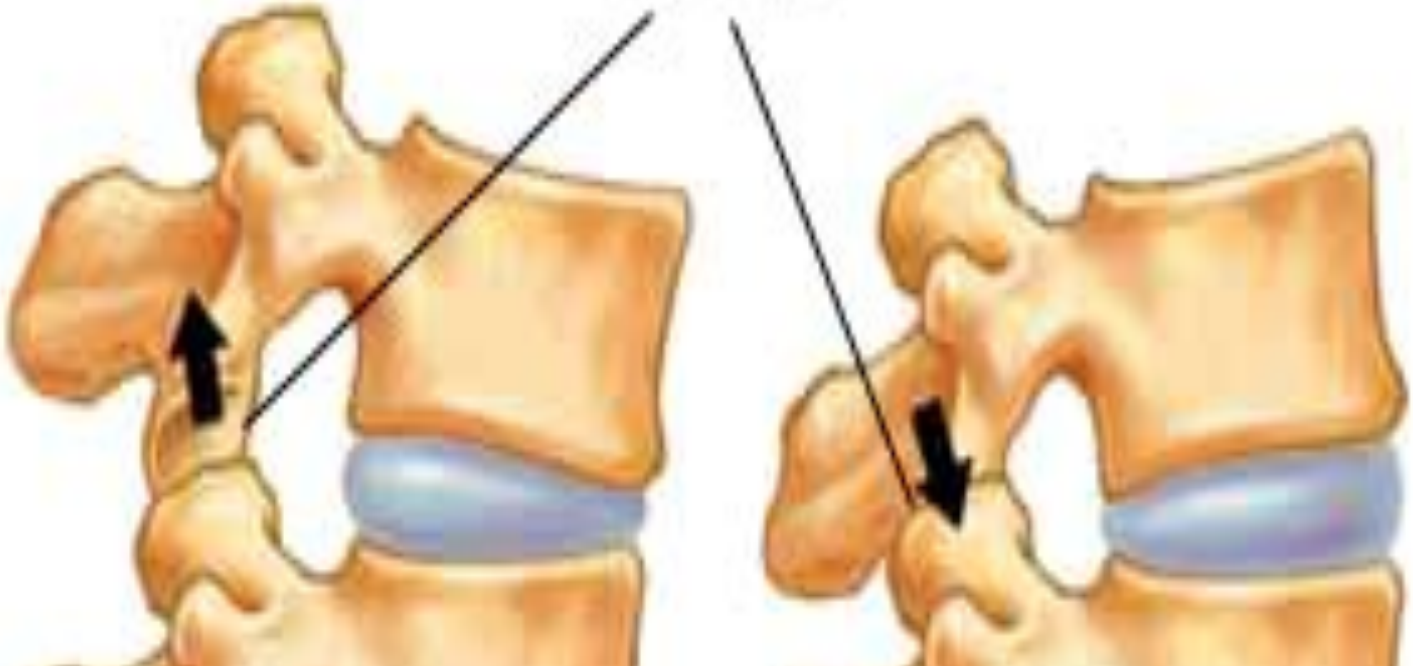
herniated disc 4%

Spinal stenosis 3%

cauda equina synd. 0.04%

is most commonly associated
with massive midline
disc herniation
but is rare

Symptoms of Facet Joint Problems

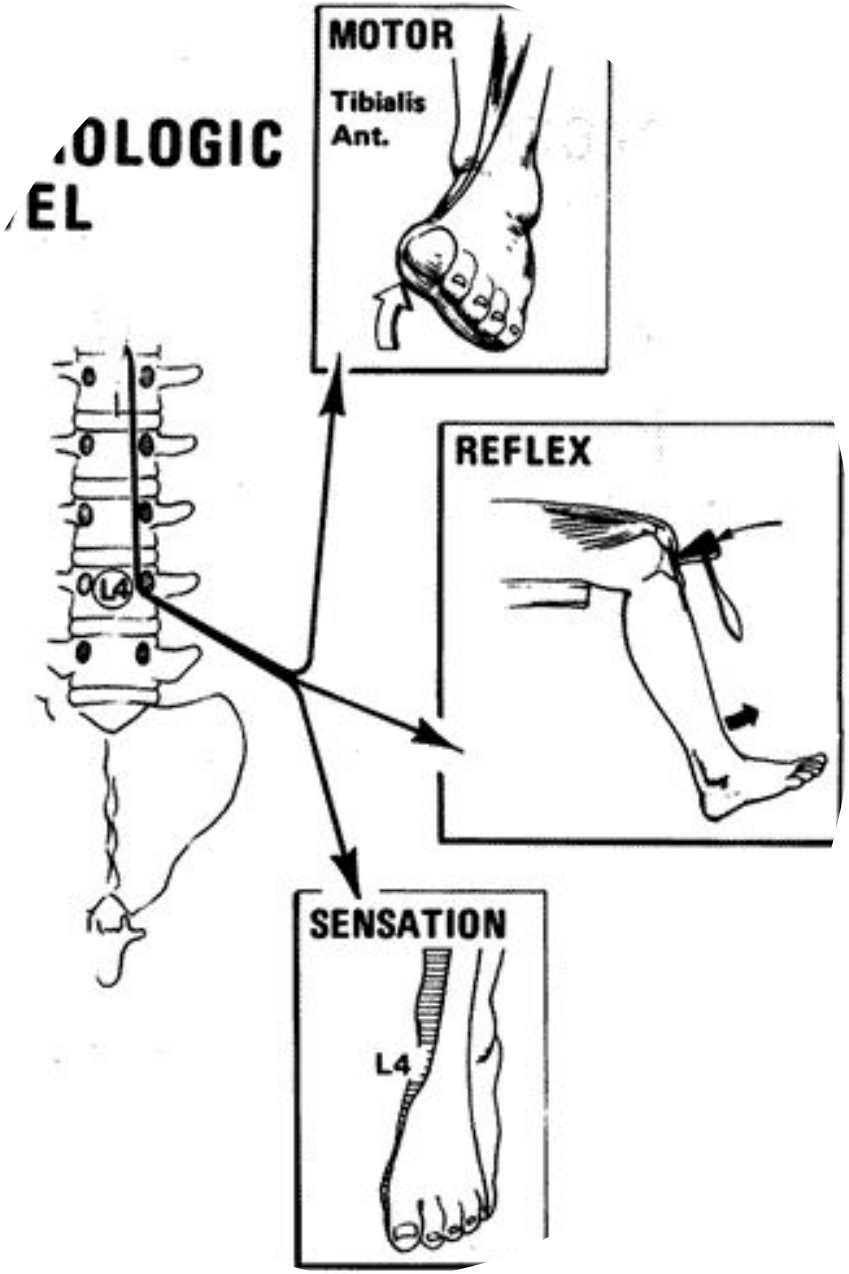


- The pain is rarely present in the front of the leg, or rarely radiates below the knee
*more discomfort while leaning backward

Clinical Evaluation

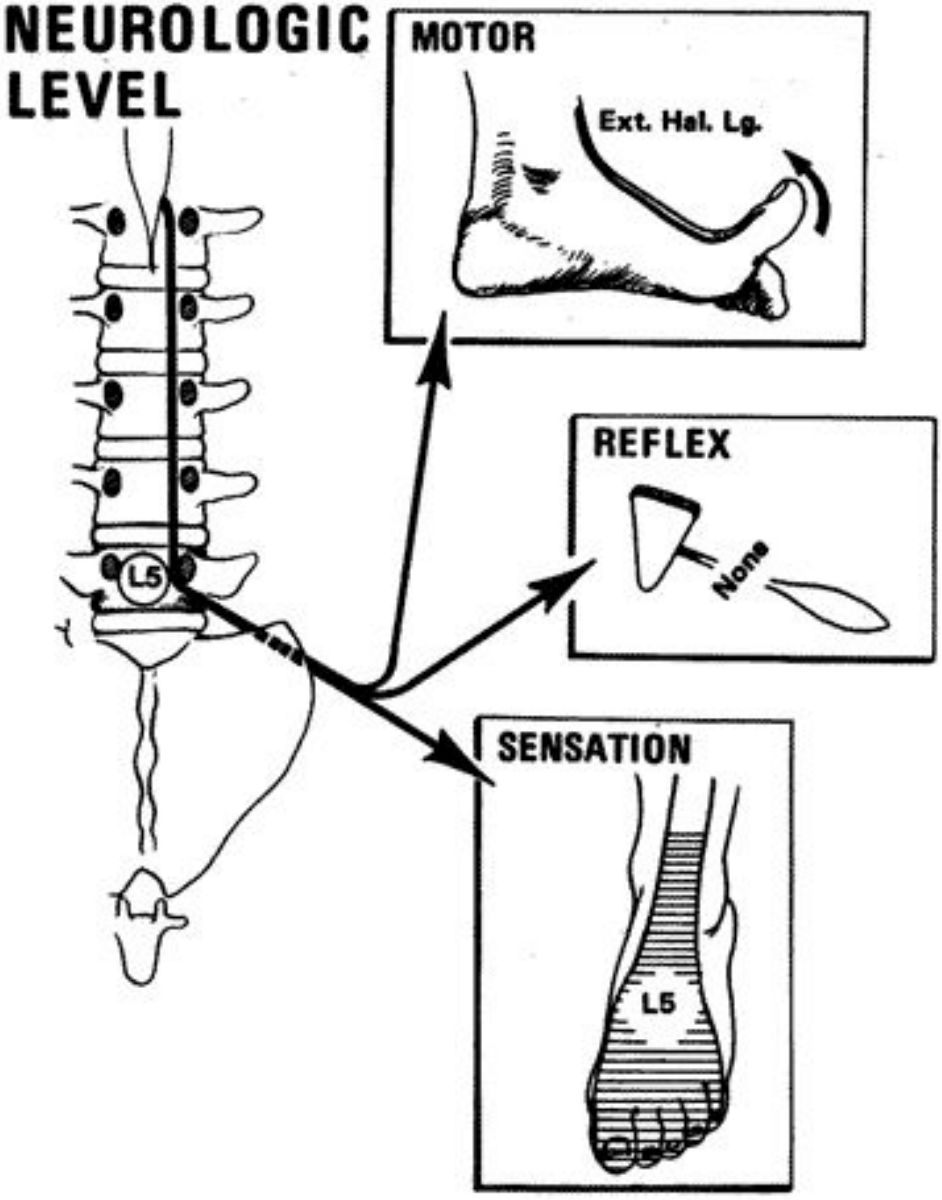
- *History*
- *Physical Examination*
- *Radiologic Evaluation*
- *Electro - Diagnosis*

(assist in confirming the clinical formulation)

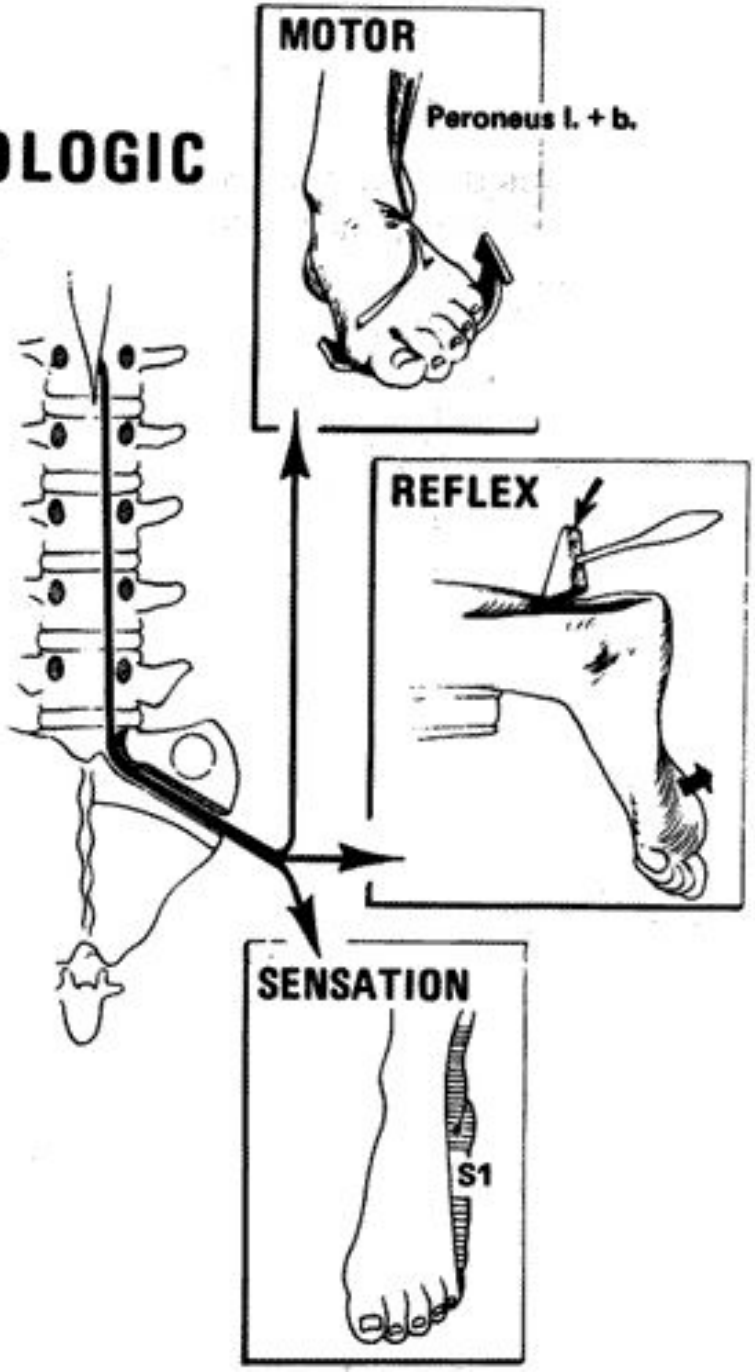

OLOGIC
EL
MOTOR
Tibialis
Ant.
L4
REFLEX
SENSATION
L4

L5

NEUROLOGIC LEVEL



S1
NEUROLOGIC LEVEL



***The Diagnosis** of back pain should be*

***Based on** a **Good History** and*

a ***Competent Physical examination***

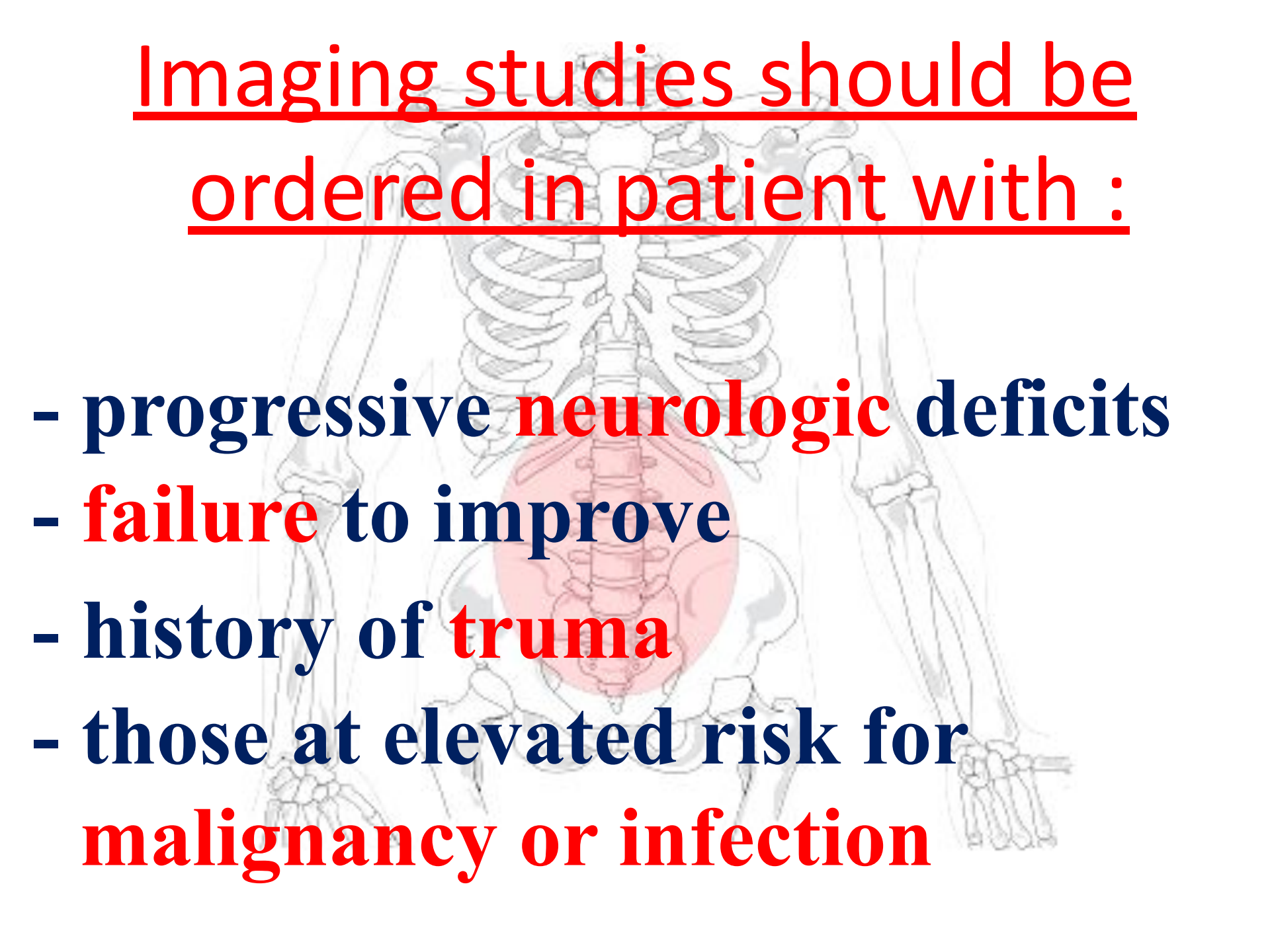
Clinical examination is the

most important

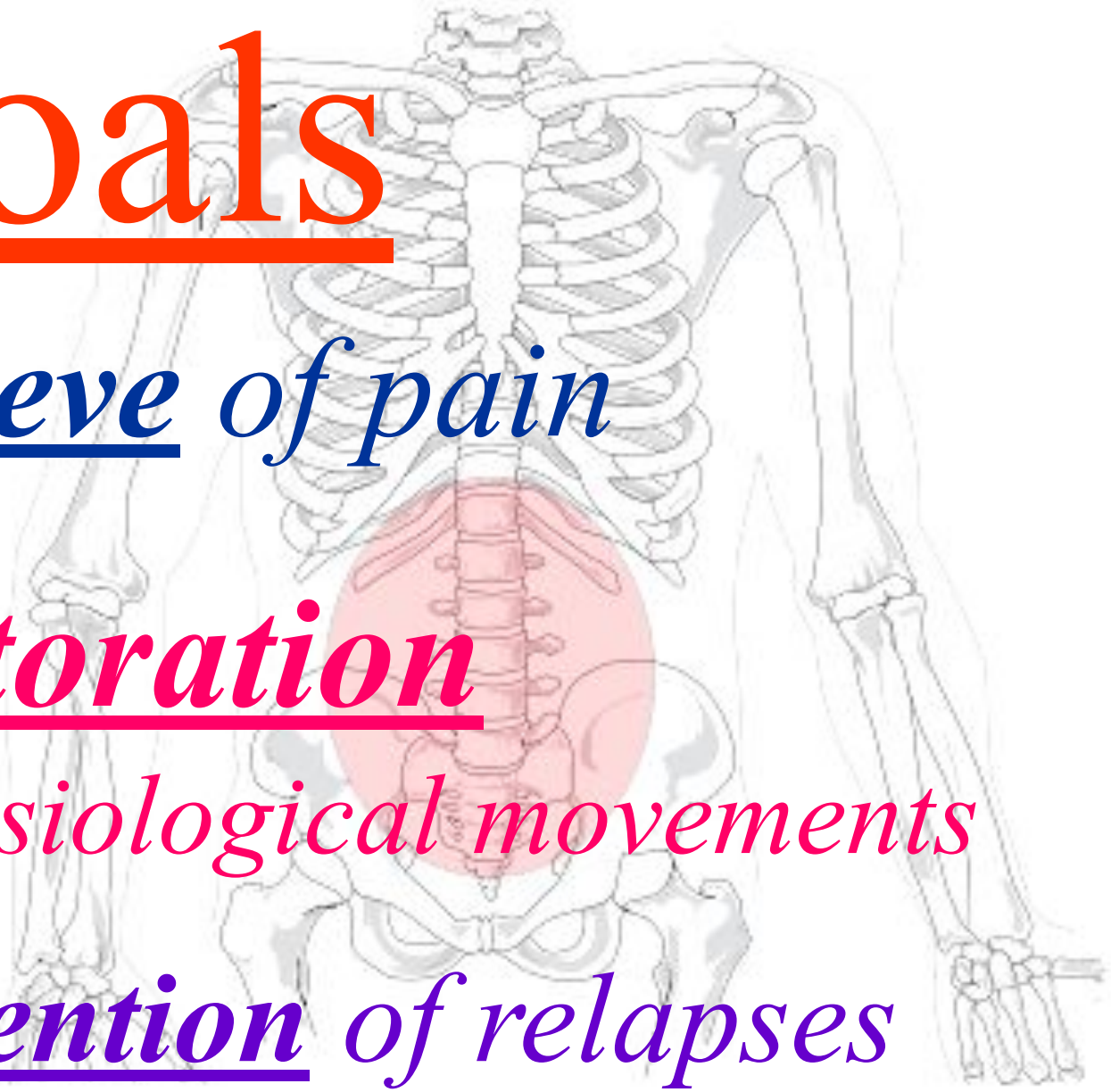
Diagnostic procedure that will be undertaken

Imaging studies should be ordered in patient with :

- progressive neurologic deficits
- failure to improve
- history of truma
- those at elevated risk for malignancy or infection



Goals



*Relieve of pain

*Restoration

of physiological movements

*Prevention of relapses

Surgery ***should be considered for***

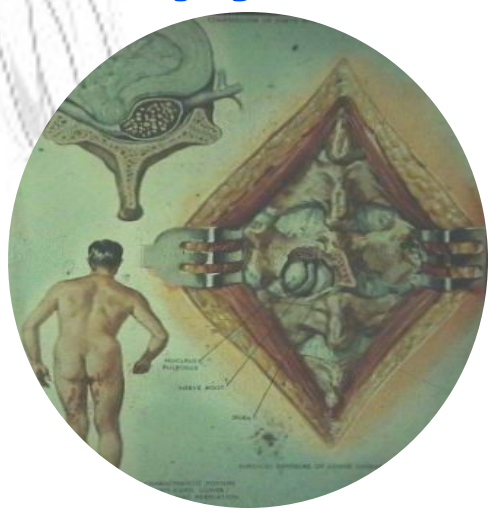
*Cauda equina syndrome .

* Individuals With ***Motor Weakness***

* Persistant Radicular pain

Failure of Conservative therapy

at ***3***or more months .



Fibromyalgia Syndrome

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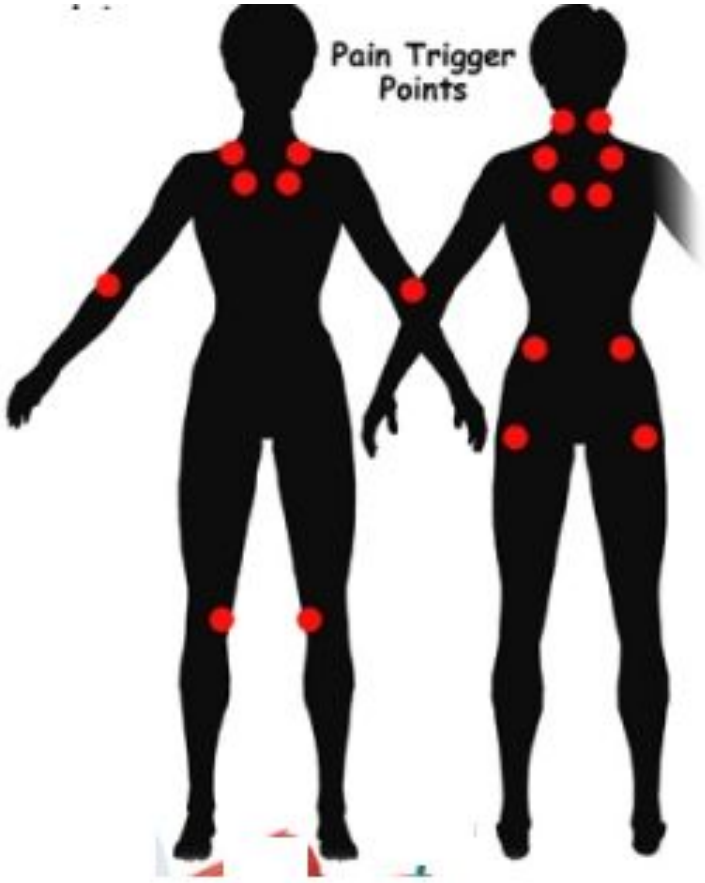

- **Typically presents with symptoms of diffuse body pain frequently involving the spinal region**
- **Neurologic Clinics - Volume 25, Issue 2 (May 2007)**

Fibromyalgia is associated with :

- **Fatigue**
- **Sleep disorder**
- **Anxiety , Depression**
- **Cognitive disturbance(memory and thinking skills)**
- **Tension/migraine headaches**
- **Exercise intolerance**
- **Irritable Bowel syndrome**

ACR 1990 Criteria for Fibromyalgia

- **Widespread pain with a minimum duration of 3 months**
  - Both right and left sides
  - Both above and below the waist
  - Axial skeletal pain
  - Wolfe F, et al.*Arthritis Rheum* 1990, 33:60-72.

Enhanced central processing of painful stimuli is manifested by:

- **Hyperalgesia** (increased response to painful stimuli) and
- **Allodynia** (sensitivity to normally non-painful stimuli)
  - A pathognomonic finding in fibromyalgia.

Eleven or more tender points at 18 specific anatomical sites

1. Insertion of nuchal muscles into occiput
2. Upper border of trapezius-mid-portion
3. Muscle attachments to upper medial border of scapula
4. Anterior aspects of the C5, C7 intertransverse spaces
5. 2nd rib space - about 3 cm lateral to the sternal border
6. Muscle attachments to lateral epicondyle
7. Upper outer quadrant of gluteal muscles
8. Muscle attachments just posterior to greater trochanter
9. Medial fat pad of knee proximal to joint line

A total of eleven or more tender points in conjunction with a history of widespread pain is characteristic of the fibromyalgia syndrome.

The Etiology of fibromyalgia remains unclear, Current hypotheses:

- Aberrant CNS processing of pain
- Dysfunction of the hypothalamic-pituitary-adrenal axis

Triggers of Fibromyalgia

- Physical trauma (car accidents)
- Infections such as hepatitis C, Epstein-Barr virus, parvovirus, or Lyme disease
- Emotional stress
- The "Gulf War illnesses"

Aggravating factors were:

- Emotional distress
- Weather changes
- Exertion

Healthy individuals with normal sleep and exercise patterns when deprived from Sleep and exercise Suffered from

- Increased Pain
- Fatigue
- Mood disturbance
- Cognitive disturbance
- Sleep deprivation causing greater impact

Why should we know it better?

- *It is the second most common diagnosis made in rheumatology clinics*
  and the most common cause of generalized, musculoskeletal pain in middle aged women

Why should we know it better?

- It is associated with substantial morbidity and disability
- It may masquerade the initial stages of SLE or RA

Why should we know it better?

- Co-existing fibromyalgia may be confused with a flare of SLE and RA
- Patients with FM were found to have significantly higher (HAQ) scores than RA patients.

It has to be differentiated from other serious causes of myalgia

- Polymylgia rheumatica
- Statins therapy
- Hypothyroidism
- Polymyositis.

Optimal treatment of FMS mandates a multidisciplinary approach, including

- .Pharmacologic and
- Non- Pharmacologic interventions

Treatments should be specifically tailored to Patient reports of :

- **Pain intensity**
- **Function**
- **Associated features such as**
  - **Depression**
  - **Fatigue**
  - **Sleep disturbance.**

Pharmacologic treatment: Strong evidence for

- **Antidepressants:**
  - **Dual re-uptake inhibitors**
    - **TCA (amitryptiline, cyclobenzaprine)**
    - **SNRIs (milnacipram, duloxetine)**
- **Anticonvulsants**
  - **Gabapentin**
  - **Pregabalin**

Non-Pharmacological therapies

- Strong evidence
  - Education
  - Aerobic exercises
  - Cognitive behavioral therapies

Educational Points

- The patient must be reassured that fibromyalgia is a real illness, and not imagined .
- The benign nature of the disorder should also be emphasized.
- It is not a deforming condition, and that it is neither life-threatening nor a cosmetic problem.

Aerobic Exercises

- General guidelines:
  - Begin 2–3 months after start of drug therapy
  - Begin with low impact exercises

Take away message

- Patient Education
- Aerobic exercises
- Heated pool treatment
- Cognitive behavioral therapies
- Complement drug therapy.