



PRIMEPHYIO TRAINING UK
ORTHOPEDIC MANUAL THERAPY CERTIFICATE (OMTC)

Mahmoud Saad



2006-2018

www.primephysio.com



www.PRIMEPHYSIO.com

2006-2018

8000 physiotherapists and Medical doctors

UK-Egypt-Oman-Kuwait-Lebanon –Jordan-KSA-Qatar-Malta-
Sweden-Sudan-Dubai

Introducing concepts
Holistic Management
Changing beliefs





Malta Association of
Physiotherapists



**Sheffield
Hallam
University**



KUWAIT UNIVERSITY



Cairo University



سلطنة عُمان
وزارة لصحة
SULTANATE OF OMAN
MINISTRY OF HEALTH

PRIMEPHYSIO

TRAINING FOR PHYSIOTHERAPISTS

Scope of Practice



Emphasis on Quality
Evidence.
Active Learning

experienced tutors
with strong clinical
and academic
background.

Affiliate with
teaching and clinical
organizations

Physiotherapy
courses at basic
expenses cost in
developing countries

Accreditation service

Free access to
learning activities
free online courses.

OMTC

- TUTOR
- HISTORY
- OBJECTIVES
- STRUCTURE

PRIMEPHYSIO

TRAINING FOR PHYSIOTHERAPISTS



OMTA

Program Tutors:

Mahmoud Saad

Ken Chance Larsen





**Sheffield
Hallam
University**



Associate Senior Lecturer. Sheffield Hallam University SHU-UK.
Fellow Higher Education academy.UK
Certified McKenzie Therapist-Chair MIE 2010-2013
Clinical specialist - National Health Service NHS.UK
Chartered Society Physiotherapy MCSP.
Certified Medical Taping Tutor.
PRIMEPHYSIO. Founder.
Certified Manual therapist. UK. IFOPMT
Chairperson . Orthopedic Manual therapy Egypt OMTAE



Best modern university in the north of England 2016...

- Undergraduate Program
- Advanced Msc Physiotherapy
 - F2F
 - Distance Learning
- MSc in Manual Therapy
- PHD Program
- Professional doctorate program

Sheffield
Hallam
University

42 Collegiate Crescent

HISTORY

- OMTC Started 2004
- 58 Intakes
 - UK-Dubai-Egypt-KSA
 - Qatar-Jordan-Palestine –Sudan
- 2000 + Physios and medical doctors

The logo for PRIMEPHYSIO is contained within a white hexagonal frame with a purple border. The word "PRIMEPHYSIO" is written in a purple serif font. Below it, the tagline "TRAINING FOR PHYSIOTHERAPISTS" is written in a smaller, orange sans-serif font.

PRIMEPHYSIO

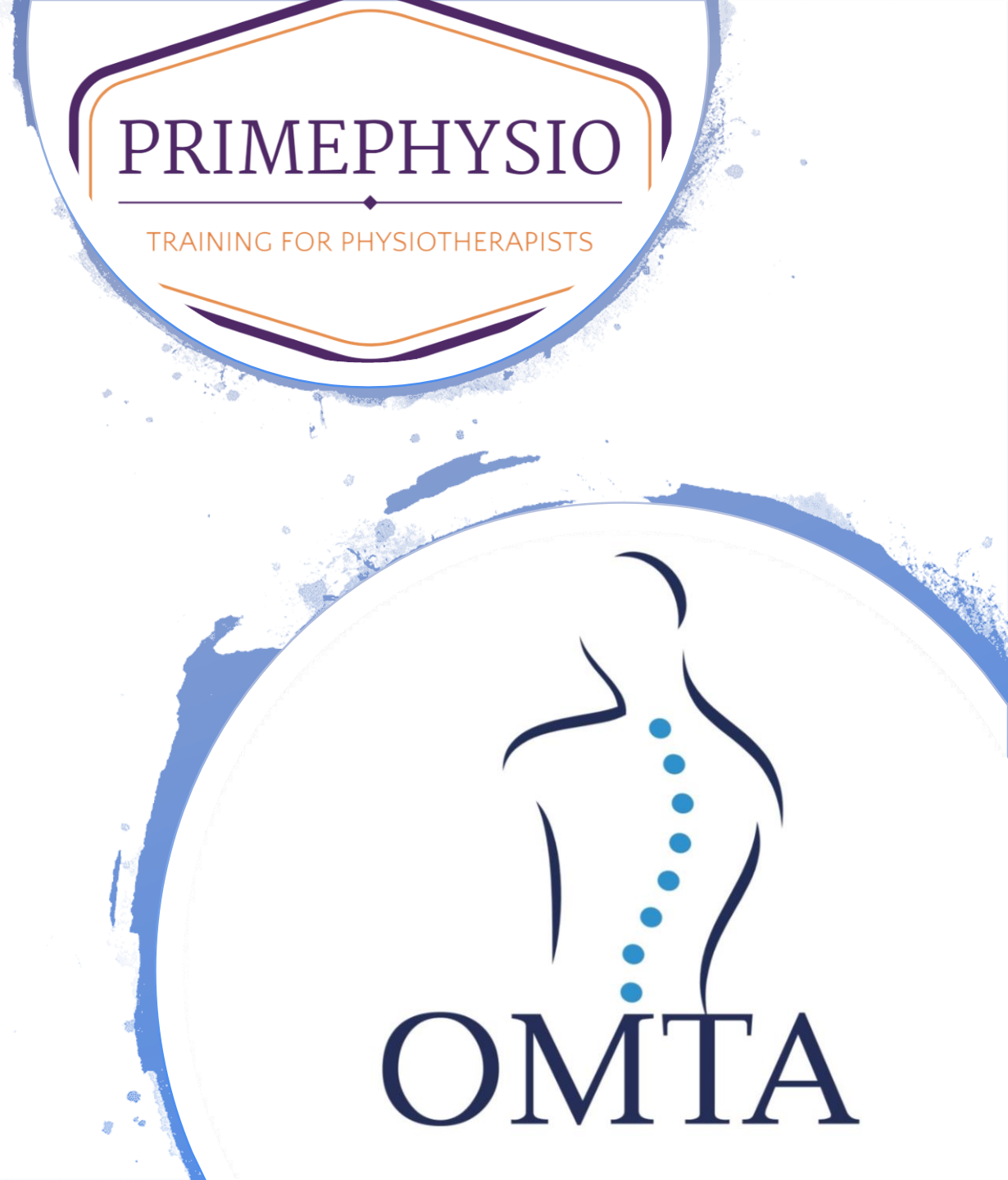
TRAINING FOR PHYSIOTHERAPISTS

The OMTA logo features a stylized human figure in dark blue, with a vertical line of seven blue dots representing the spine. Below the figure, the letters "OMTA" are written in a large, dark blue serif font.

OMTA

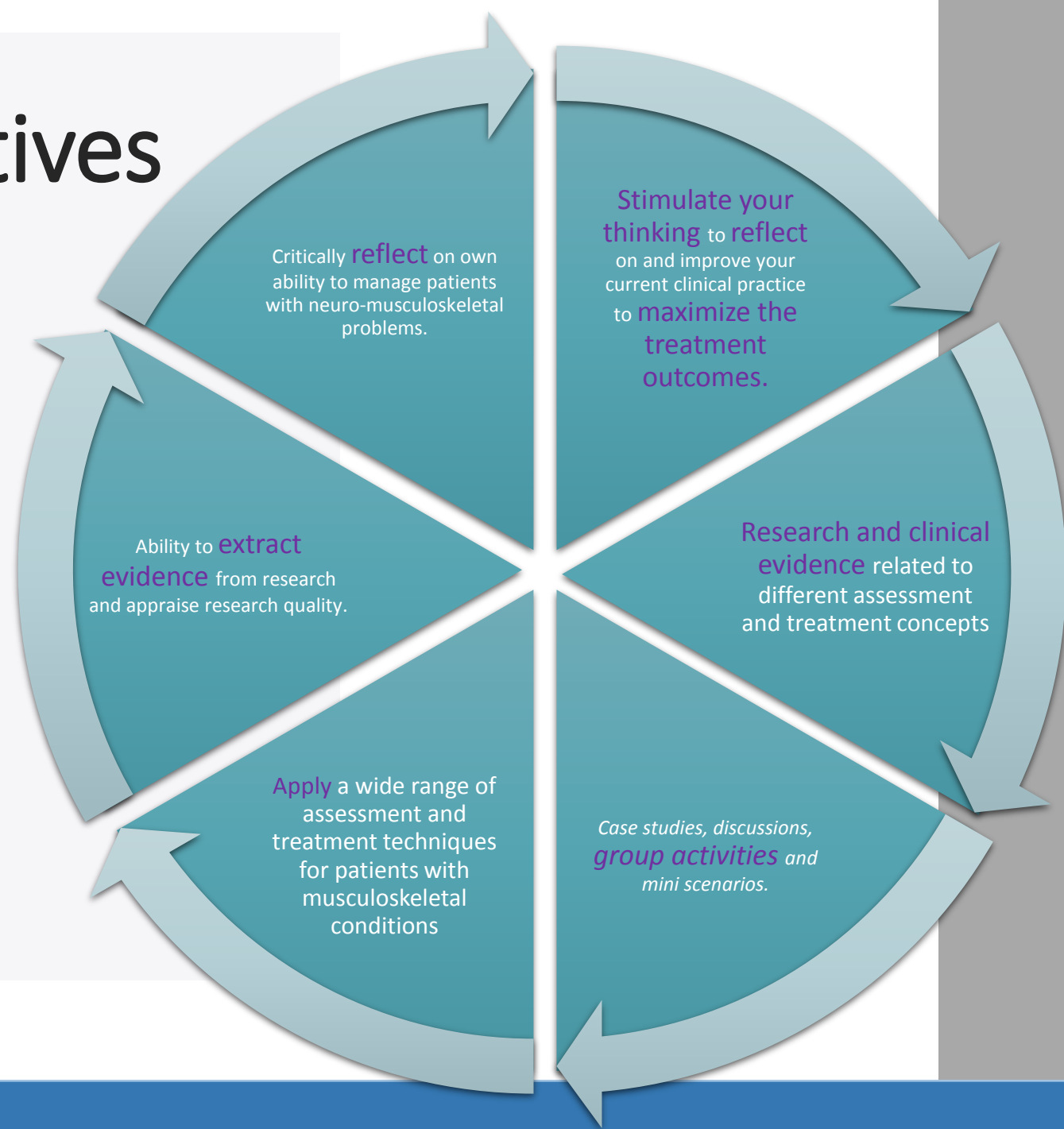
HISTORY

- OMTC Previously known as Primehysio OMT diploma
- Orthopaedic Manual Therapy Academy (OMTA)
is part of Primephysio Training UK Group



OMTA

Objectives



Program Structure

- **Module 1:**
Manual therapy foundation
2 days 16 Hours (2 days 8 hours a day)
- **Module 2:**
Clinical reasoning and practice for spine and extremities
2 days 16 Hours (2 days 8 hours a day)
- **Module 3:**
Integrated manual therapy approach for spine and extremities.
2 days 16 Hours (2 days 8 hours a day)

Program Structure

Task 1: Online MCQ 50 Marks

- Day 2, 20 MCQ, 10 Marks
- Day 4, 20 MCQ, 10 Marks
- Day 6, 30 MCQ, 30 Marks

Task2 :

- Informal evaluation by the program tutor/s
- Successfully completing and signing the practical booklet



RULES

- 20 Min talk rule. If necessary!
- There is no question called silly
- Listen-talk- brainstorm. No right and wrong
- Assess your own progression. Use the SWOT analysis sheet
- Practical labs are for practical application not for watching
- Video taping allowed with tutors permission during practical lap only.

Your objectives !





Day (1)

Introduction, Ice breaker and Testing the water

Setting the scene

Pain and neurophysiology education

Identifying neural pain and clinical relevance?

Role of neural mobilisation in differential diagnosis and management.

Arthrogenic pain.

Mobilisation strategies and role in management

Justification and application of movement therapy



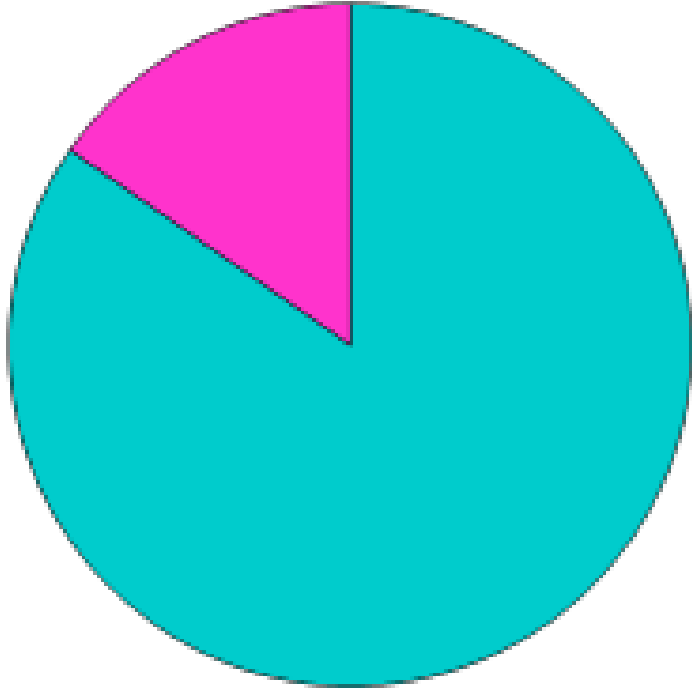
Introduction

Musculoskeletal problems

Most common conditions treated by Physiotherapists (Dean et al 2011)

The most common cause of physical disability globally. (Ves et al 2010)

GP visits in the UK (May 2012)



Conclusions from the Literature

- **Commonest chronic condition** in the general population-Large numbers seek health-care. (Grieves 2016)

Symptoms can persist even after treatment and treatments often provide **short-term relief** only.(O'sullivan 2005)

Conclusions from the Literature

- **Validity and reliability** of accepted diagnostic categories is uncertain. e.g. shoulder tests(May et al 2010)
- The evidence in systematic reviews and controlled trials is **not supportive** of many commonly used treatment interventions.
- The only intervention that consistently appears capable of offering long-term management strategies is **exercise.**

A young girl with dark skin and hair is shown from the chest up. She has her right hand pressed against her cheek, with her fingers spread, and is looking directly at the camera with a curious or questioning expression. The background is dark and out of focus.

Few Myths!

- Special Tests: e.g. NEER's Test (1972)
- Diagnostic Labels
- Bio-medically driven assessment
- Imaging !



Modern OMT

- Assessment is a multidimensional and multi-purpose process.
- Treatment ! there is no size that fits all..
- Biomechanical models are questioned e.g. Fry's Laws
- Evidence for Neurophysiology education .. Link to clinical practice
- Dear Patient : It is all about you ... compliance (Chad Cook 2017)



Modern OMT

- **Assessment :**

To build therapeutic **relationship**

To **change/challenge** wrong beliefs

Practice your Job as a **drug dealer**

Agree the terms and conditions and **Sign the contract**

Modern OMT

- **Assessment :**
 - To maintain patient's safety- **Exclude Red Flags**
 - Decision making . **Keep or refer**
 - **Never** exclude any possibility

If you are in doubt!! kick it out.. Salma Saad (2018)





Modern OMT

Assessment : that guides treatment e.g

- Active and Passive ROM Testing
 - Joint (mobilise) - Muscle (load)
- Neurodynamic testing
 - Identify Source of symptoms
 - Guides treatment

Case study P???. In groups of 4

Important questions you **MUST** ask with justification!

Physical examination ... Prioritise.

Clinical impression !

Complete *your* assessment sheet and keep it for later.

The background is a dark, moody landscape. A large, bright, circular orb, possibly a moon or a low sun, is positioned in the upper left quadrant, casting a soft glow. Below it, a body of water reflects the orb and the surrounding dark environment. The sky is dark and textured, with some faint, wispy clouds. The overall tone is mysterious and cinematic.

Setting the scene

TYPES OF PAIN

**Somatic –
musculoskeletal
structures:**

Deep and aching in quality

Vague and hard to localise.

The stronger the noxious stimulus the further pain peripheralises.

**Radicular /
nerve root pain:**

Experienced in the leg.

Associated with dermatomal pain patterns

Nerve function abnormalities e.g. weakness or paraesthesia, and abnormal tension tests

Central :
Abnormalities in central
nervous system. *Central
sensitization.*

Visceral :
From organs. Bladder-
Kidney-Uterus-Prostate

Pain generating mechanism (Glifford 2013-Mckenzie and may 2003)

STATE OF TISSUES

Normal
Inflamed (acute)
Healing (sub-acute)
Abnormal (contracted / scar tissue)
Abnormal (derangement)
Persisting hypersensitivity (chronic)
Barriers to recovery (acute to chronic)

PAIN MECHANISM

Abnormal stress – mechanical
Predominantly chemical – somatic and/or radicular
Chemical / mechanical interface
Mechanical – somatic and/or radicular
Mechanical – somatic and/or radicular
Peripheral / central sensitisation
Psychosocial factors

Factors identifying Mechanical & inflammatory pain

INFLAMMATORY

- Constant pain
- Recent onset (traumatic or possibly insidious)
- May be swelling, redness, heat, tenderness
- All movements aggravate symptoms
- No movement found which abolishes or centralises pain **
- More commonly intermittent but may be constant.

MECHANICAL

- Constant pain; But Certain repeated movements cause a lasting reduction, abolition or centralisation of pain **
- Movements in one direction may worsen symptoms, whereas movements in the other direction will improve them
- The mechanical presentation will improve along with the symptoms

***Abolition means 0/10 - centralisation in case of spinal related symptoms.*

Lamborghini and spinal pain

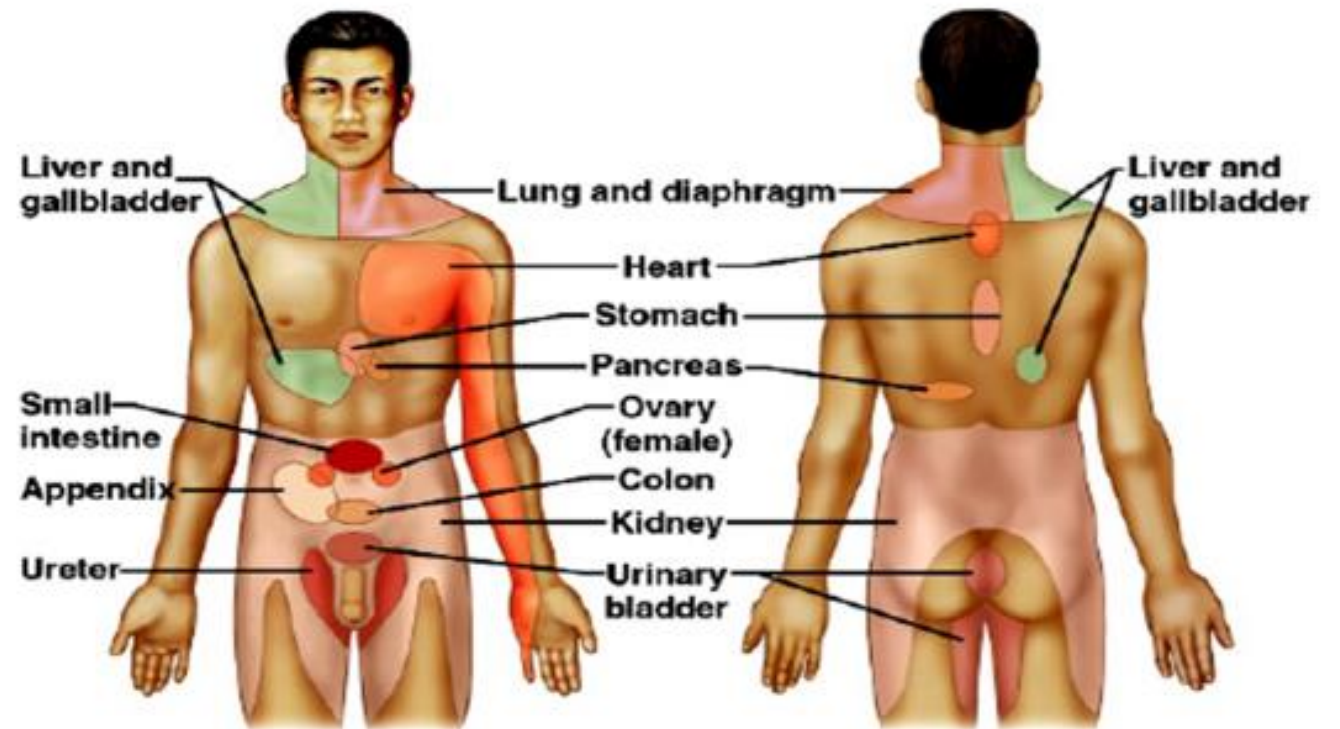
When the mechanical goes inflammatory





For sale ... 1,000,000

Visceral pain





- The KEY:

“It is always with sitting , I'm fine on the move”

“It does not matter what position I sleep on at night, I wake up with shoulder pain”

“ Few UTI in less than a year, then this silly LBP, not sure what is going on”

“ Walking is a bit difficult , I feel the soreness deep inside the knee, has to rest before I carry on walking”

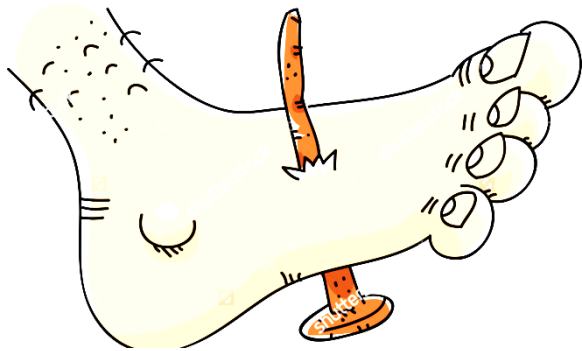
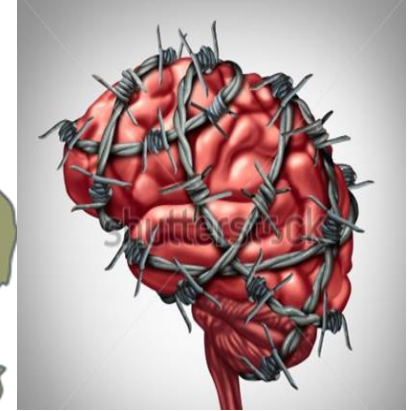


Pain is in the brain
the tissue is not the issue



In groups :

What is the clinical
relevance of these
scenarios ?



Brain Centres & freedom of information



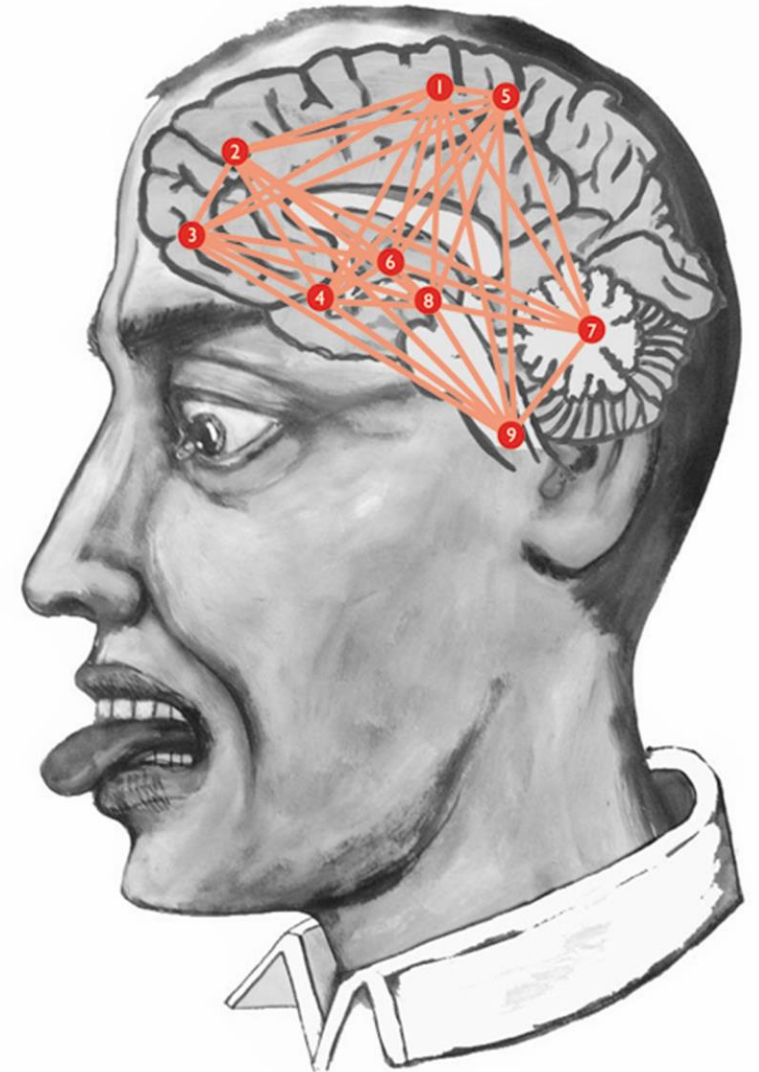
**HISTORY &
HEADLINES**

July 4, 1966: Freedom Of Information Act Enacted

Neurotag. Buttler (2000)

A TYPICAL PAIN NEUROTAG

1. PREMOTOR / MOTOR CORTEX
organise and prepare movements
2. CINGULATE CORTEX
concentration, focussing
3. PREFRONTAL CORTEX
problem solving, memory
4. AMYGDALA
fear, fear conditioning, addiction
5. SENSORY CORTEX
sensory discrimination
6. HYPOTHALAMUS / THALAMUS
stress responses, autonomic regulation, motivation
7. CEREBELLUM
movement and cognition
8. HIPPOCAMPUS
memory, spacial cognition, fear conditioning
9. SPINAL CORD
gating from the periphery



Chronic Pain (Glifford 2013)

- May be influenced by non-mechanical factors
 - No or minimal link to the original tissue damage
 - Unclear correlation between the extent of injury and reported patient symptoms
 - Possibility of neurophysiological, psychological or social factors
 - Possibility of **central sensitisation**
-

Pain Neurophysiology education

Nijs et al 2014

- Focus on convincing patients that pain does not, in itself, result from tissue damage.
- *Apply Time-contingent* approach :
“Perform the exercise for 5 minutes, regardless of the pain”
- *NOT symptom-contingent* approach
“Stop the exercise once it hurts” to exercises and physical activity.

A Modern Neuroscience Approach to Chronic Spinal Pain

Phase 1

- Pain neuroscience education:
 - changing pain beliefs through the reconceptualization of pain

Phase 2

- Cognition-targeted neuromuscular training:
 - time-contingent training of coordinated activity of the spinal muscles
 - progression to next level preceded by motor imagery

Phase 3

- Cognition-targeted dynamic and functional exercises:
 - increasing complexity of exercises to functional tasks
 - progression toward those movements for which the patient is fearful
 - exercises during cognitively and psychosocially stressful conditions

Nijs et al 2014

Smile

Assurance

Shared decision

Professionalism

Trust

Education

Car Key



Summary and clinical implication

Pain is a multidimensional process.

Addressing different factors affecting pain perception is a clinical MUST DO approach.

Education/Neurophysiology education has an impact on treatment outcomes.

Treatment starts in the waiting area and the corridor and finishes whenever the patient wants.



20 minutes



Setting the scene

• **Continued**

LINKING THEORY TO PRACTICE

Four stages to a disc herniation

Degeneration



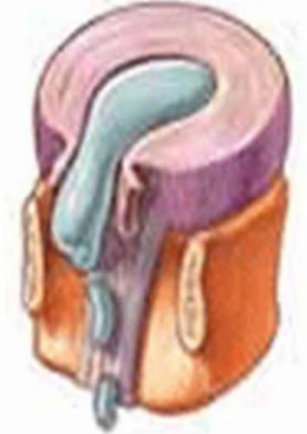
Prolapse



Extrusion



Sequestration



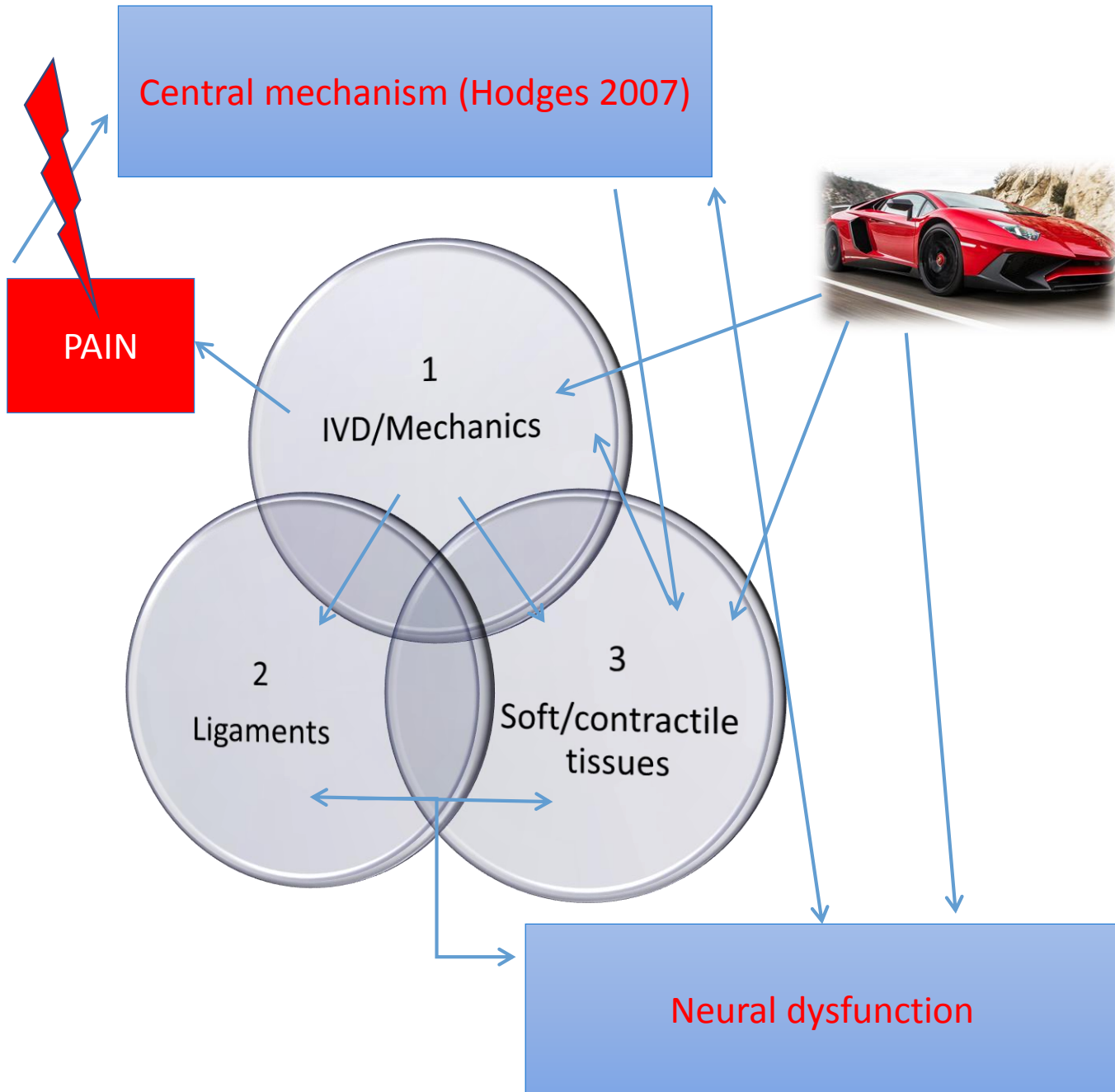
Annulus fibrosus : Back pain

Compressed nerve root : Leg Pain

Dura: Leg Pain

Other structures : Less relevant

Kuslich et al 1991



SPINE CASTLE



Hip joint pain referral patterns: a descriptive study.

Leshner JM¹, Dreyfuss P, Hager N, Kaplan M, Furman M.

+ Author information

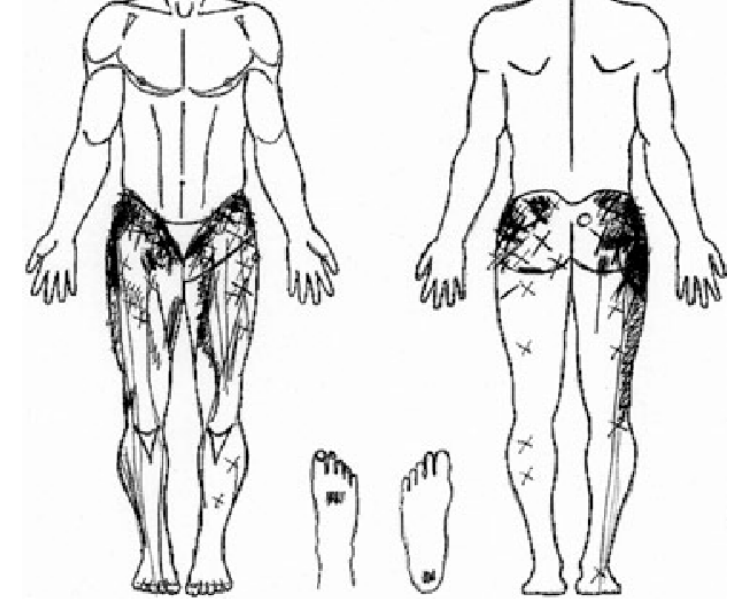
Abstract

OBJECTIVE: To determine hip joint pain referral patterns.

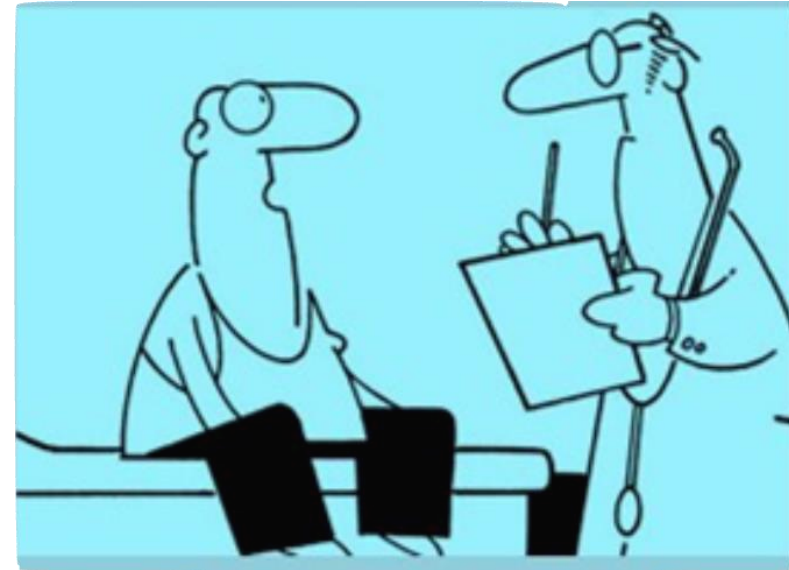
DESIGN: Retrospective analysis. Setting. Multicenter. Patients. Fifty-one consecutive patients meeting clinical criteria of a symptomatic hip joint. Interventions. Fluoroscopically guided intra-articular hip joint injection. Outcome Measures. Anatomic pain map before hip injection and visual analog scale both before and after hip injection.

RESULTS: The hip joint was shown to cause pain in traditionally accepted referral areas to the groin and thigh in 55% and 57% of patients, respectfully. However, pain referral was also seen in the buttock and lower extremity distal to the knee in 71% and 22%, respectively. Foot and knee pain were seen in only 6% and 2% of patients, respectively, while lower lumbar spine referral did not occur. Fourteen pain referral patterns were observed.

CONCLUSIONS: Buttock pain is the most common pain referral area from a symptomatic hip joint. Traditionally accepted groin and thigh referral areas were less common. Hip joint pain can occasionally refer distally to the foot. Lower lumbar spine referral did not occur.

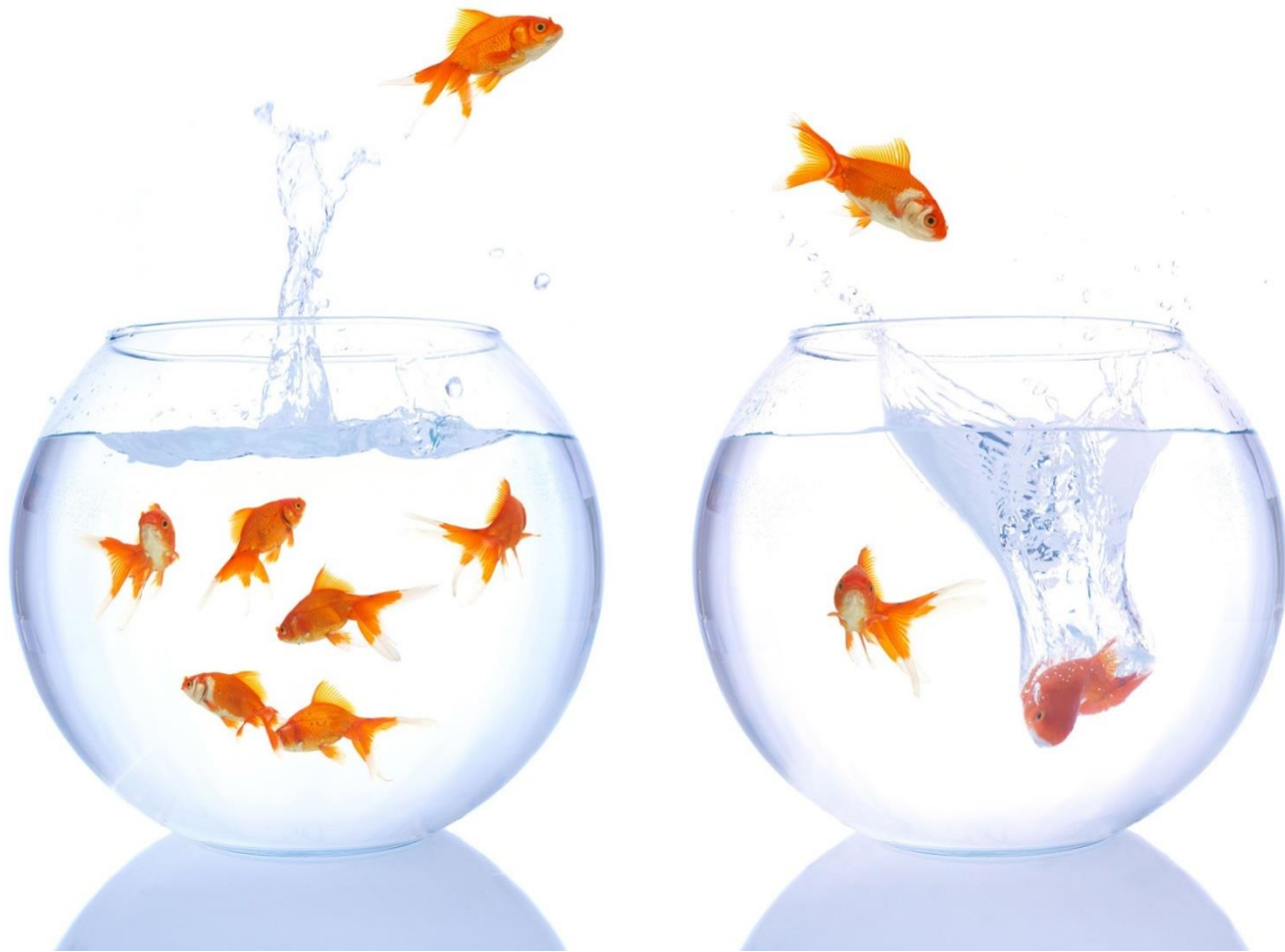


Subjective Examination



Patient: "Doctor, I get a terrible pain in my eye when I drink a cup of coffee."

Doctor: "Try taking the spoon out."



Turning
Examination
into treatment

Turning Examination into treatment

**Smile is analgesic
(Louro & Sousa,
2014).**

**Challenging the
concept not the
person. (Mosley
2017)**

**Introduce new
concept (Mosley
2017)**

**Focus on abilities
not disabilities.**

Pain Vs problem

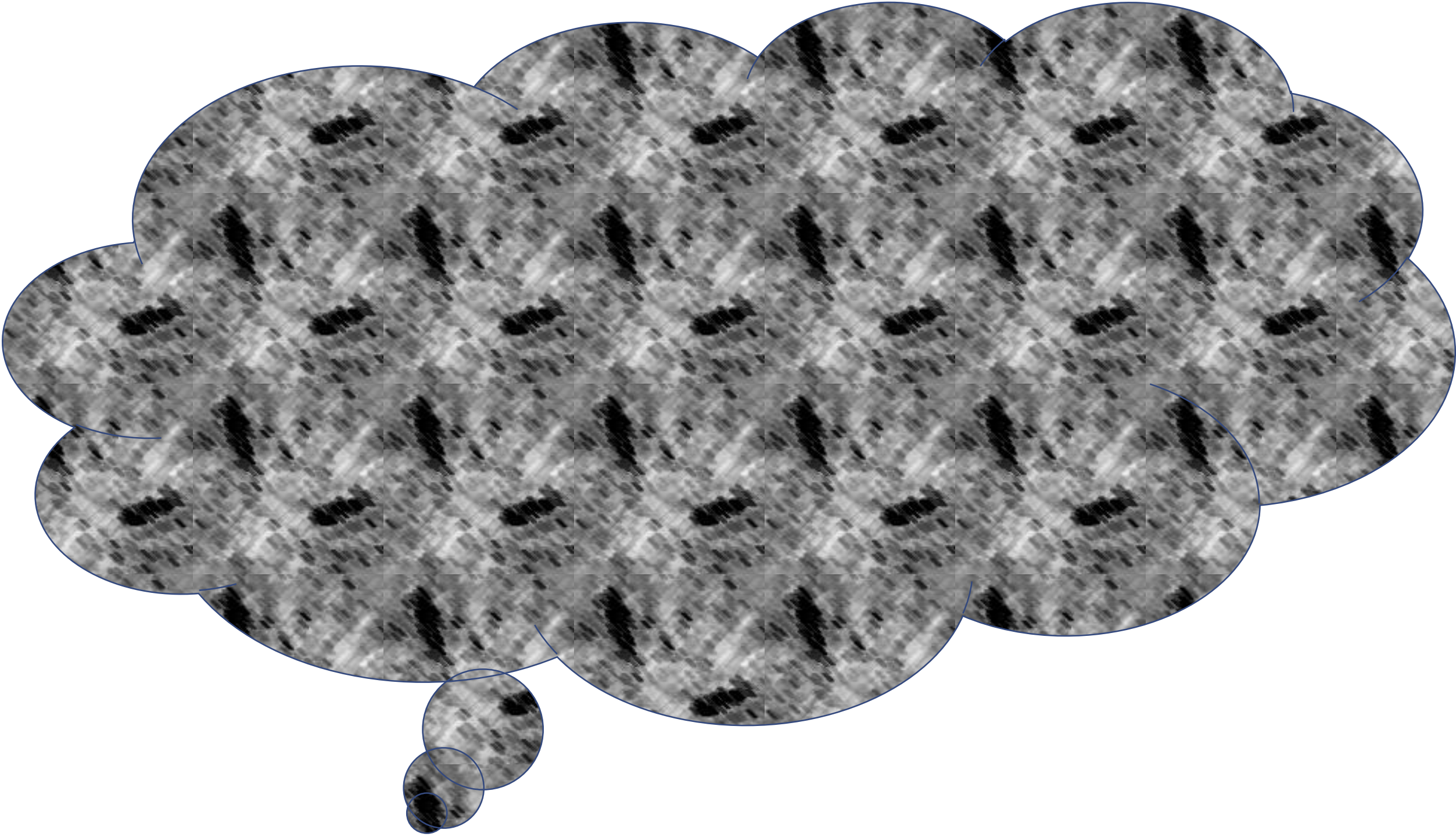
**Sign the contract..
Driver seat must be
yours.**

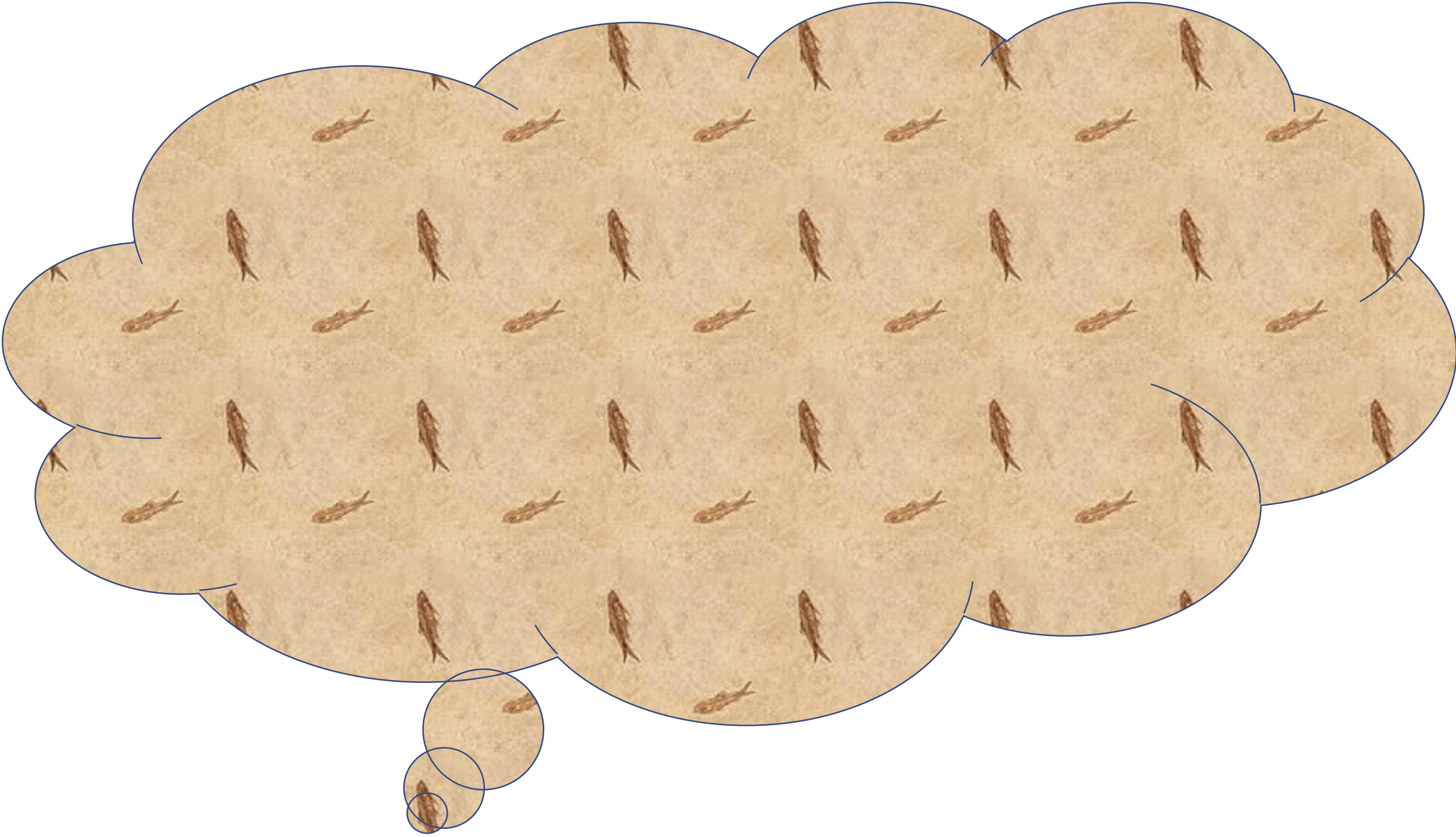
**Professionalism ...
Positive , Caring
attitude.**

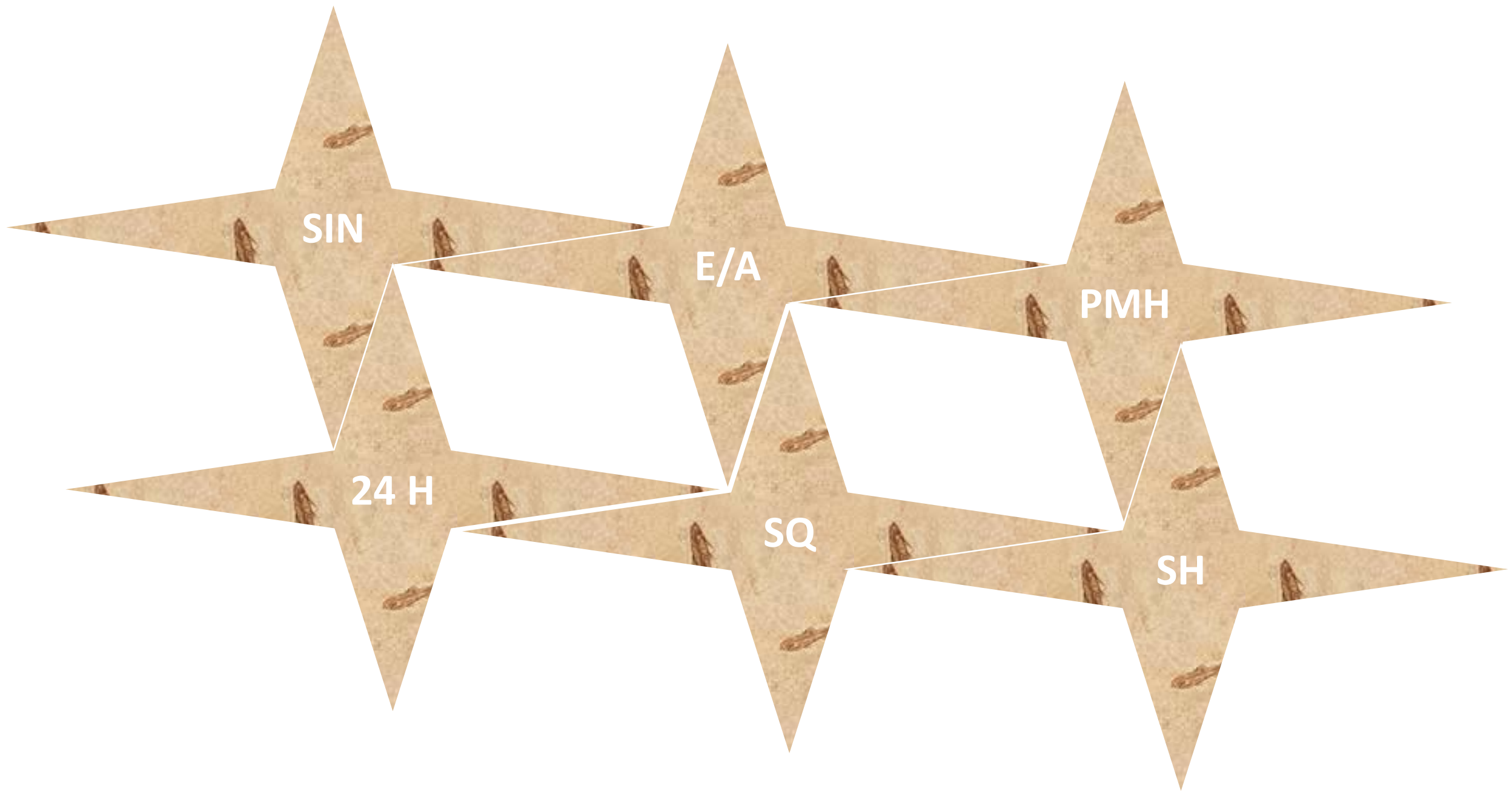
**The white shirt vs
polo shirt – student
vs senior – Lada Vs
mercedes**



The art of questioning







SIN

E/A

PMH

24 H

SQ

SH

Presenting condition

Area of symptoms

Location of Symptoms and Associated Symptoms-link

Behavior of Present Symptoms

- Association pain-posture/movement
- Constant/intermittent (pain free moments/days/periods)
- Any directional Preference
- Relationship of pain
- Aggravates & easing (or abolishing) factors

Stability

Progression of symptoms

- Better
 - How is it better?
- Same
- Worse
 - How is it WORSE?
 - Listen
 - Patient Expectations

Social History

- Occupation
 - e.g. Important daily stresses placed on the Lumbar spine
- Active Leisure Activities
 - Frequency
 - Level of participation
 - Previous activities

PMH
SQ
DH

- PMH
 - Establish comorbidities
 - General Health.
 - Some really good clues to psychological status here!
- Special Questions
 - Questions relating to Medical Conditions relevant to physiotherapy intervention.
 - Help rule out serious spinal pathology
- Drug History.

Severity
Irritability
Nature

SIN Factors

- a clinical reasoning tool designed to help you formulate your physical examination to the appropriate level.
- Valid outcome measures
- Guide physical examination and treatment choices.
- Combined with the [Must/ Should/ Could List](#) it will help you clearly identify the structures to be assessed and carry out a logical clearly structured, appropriate physical assessment.

Severity
Irritability
Nature

SIN Factors

Severity

- Is the problem severe?
- How does the patient describe the problem?
- What does the VAS tell you ?
- How is the problem affecting the patients lifestyle?
School? (WORK?) Hobbies? SLEEP? Function?
- How's the patient coping with the problem?
Medication? Psychologically

Severity
Irritability
Nature

SIN Factors

Irritability

- How easily is the problem aggravated?
- How much is the problem aggravated?
- How long does it take to settle?
- How does the patient help the problem to settle down?

Severity
Irritability
Nature

SIN Factors

- Is the condition appropriate for further assessment?
(Red Flags)
- Mechanical or inflammatory
- Peripheral/spinal/central
- Factors maintain symptoms (postural , working habits)
- Latency
- Potential yellow flags
- Myogenic
- Arthrogenic
 - Intra articular/ Extra articular
- Neurogenic
 - Neural compromise/ Adverse Neural Mechanical Sensitivity
- Peripheral/ Spinal / Central

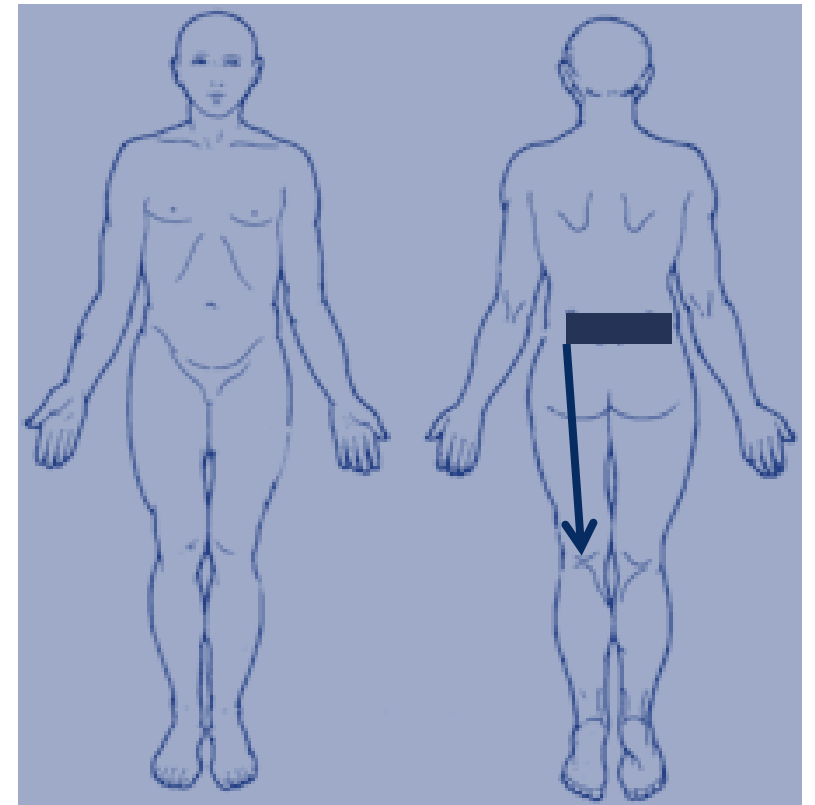
24 hours pattern

- Diurnal Pattern
 - (Morning stiffness > 2/24 systemic) (Maitland 2000)
- Nocturnal pattern (Sleep)
 - Sleep deprivation- sensitisation
 - Nocturnal disturbance : On turning?
 - One of the original **Red Flags**

Summary

What Must/ Should you ask this patient?

<u>Section</u>	What it informs
<u>PC</u>	Source / Cause
<u>HPC</u>	Source / Cause / Treatment
<u>PMH</u>	Cause / Treatment
<u>SH</u>	Source / Cause / Treatment
<u>DH</u>	Treatment
<u>24hr</u>	Source
<u>Body chart</u>	Pattern recognition
<u>Aggravating & Easing Factors</u>	Source / Cause / Treatment
<u>Red Flags</u>	Treatment / management
<u>Yellow Flags</u>	Source / Cause / Treatment





Patient Beliefs and Expectations

HOW CAN I HELP YOU TODAY?

- Is it realistic?
- If multiple problems- be focused
- Highlights possible barriers to recovery (Yellow Flags)
- Guides the treatment pathway



Aim of examination

10 seconds rule

What is the aim of my examination today?

Rule out red flags

Set outcome measures

Identify area/s of symptoms

Identify source/s of symptoms

Pick treatment tools

Send few message across to the patient

Physical examination

MUST

**To clear serious
pathology and to see if
a referral on is
required**



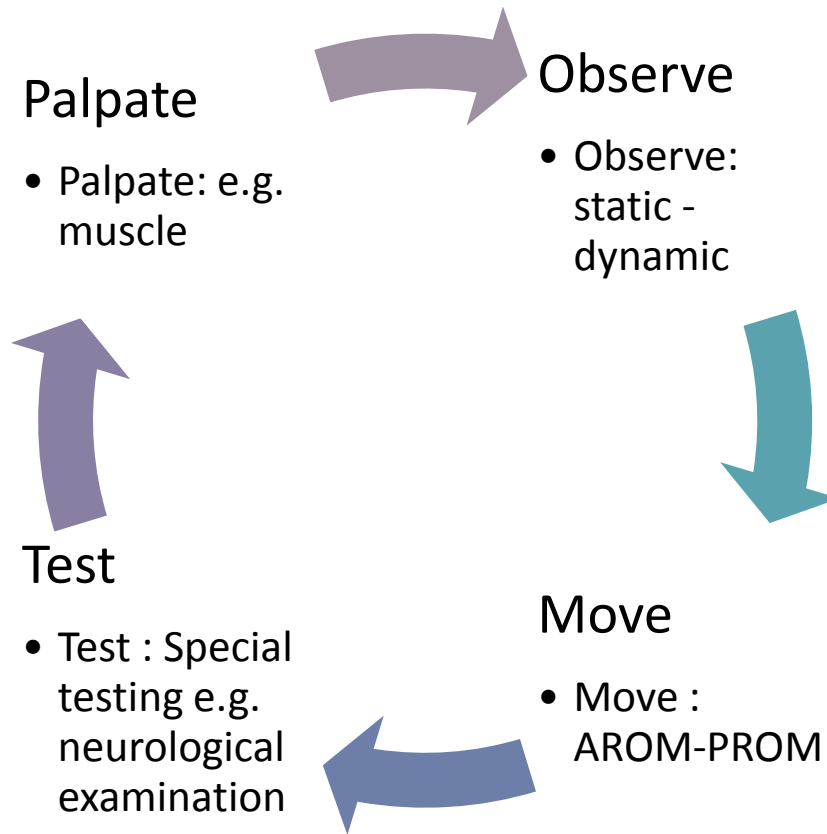
SHOULD

**To differentiate
between potential
sources. Reducing the
differential diagnosis.**



COULD

**To fully clear areas or
provoke symptom**



Physical examination



McKenzie System.. It is called mechanical DIAGNOSIS and therapy

- **3 Golden clinical tips:**
- Repeated movement testing
- Centralization and peripheralization phenomena
- Directional preference

Repeated movement testing (RMT)and directional preference (DP) (McKenzie and may 2003)

Guided by subjective examination

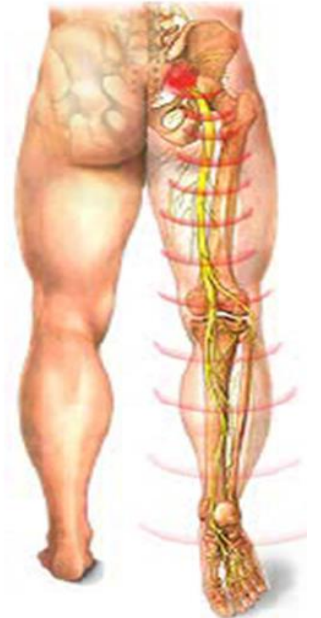
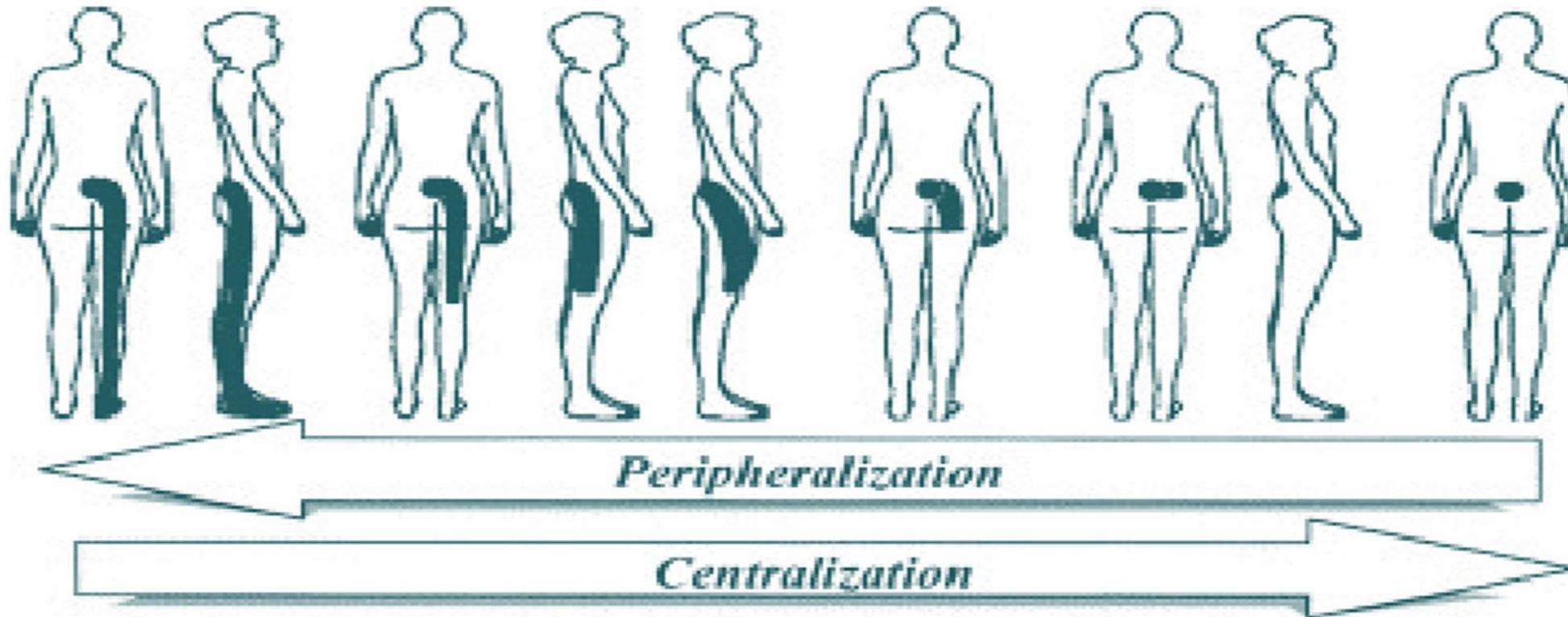
Repetition is required to change mechanical forces , hence changing symptoms (if mechanical)

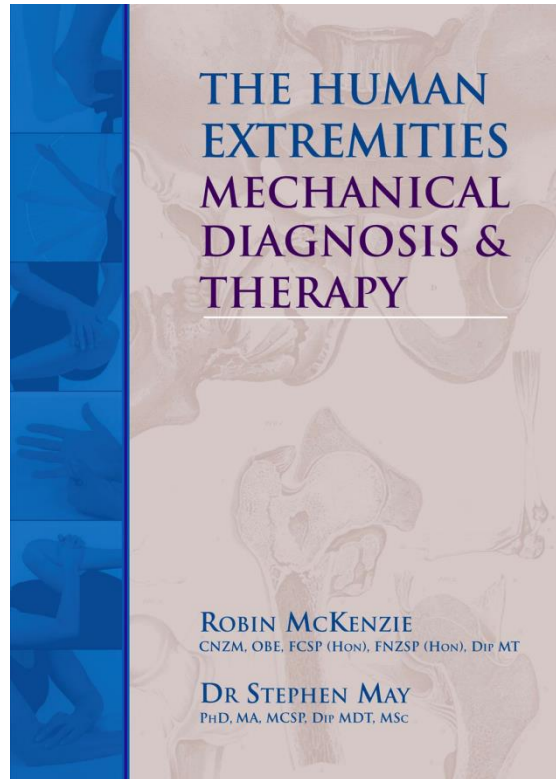
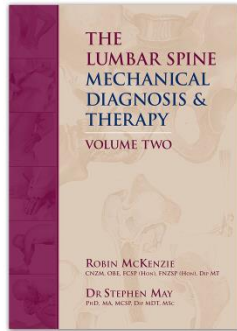
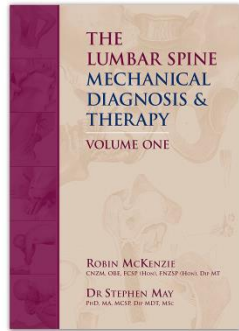
Patient move to different directions repeatedly and report change in symptoms, movement block and ROM.
Applicable for spine and extremities.

If movement to specific direction/s that centralise and/or reduce symptoms and/or increase ROM will be considered as :

PREFERED DIRECTION or MOVEMENT that guides the exercise prescription process.

Centralization and peripheralization phenomena





If symptoms move up to the back does not necessarily mean it is centralises

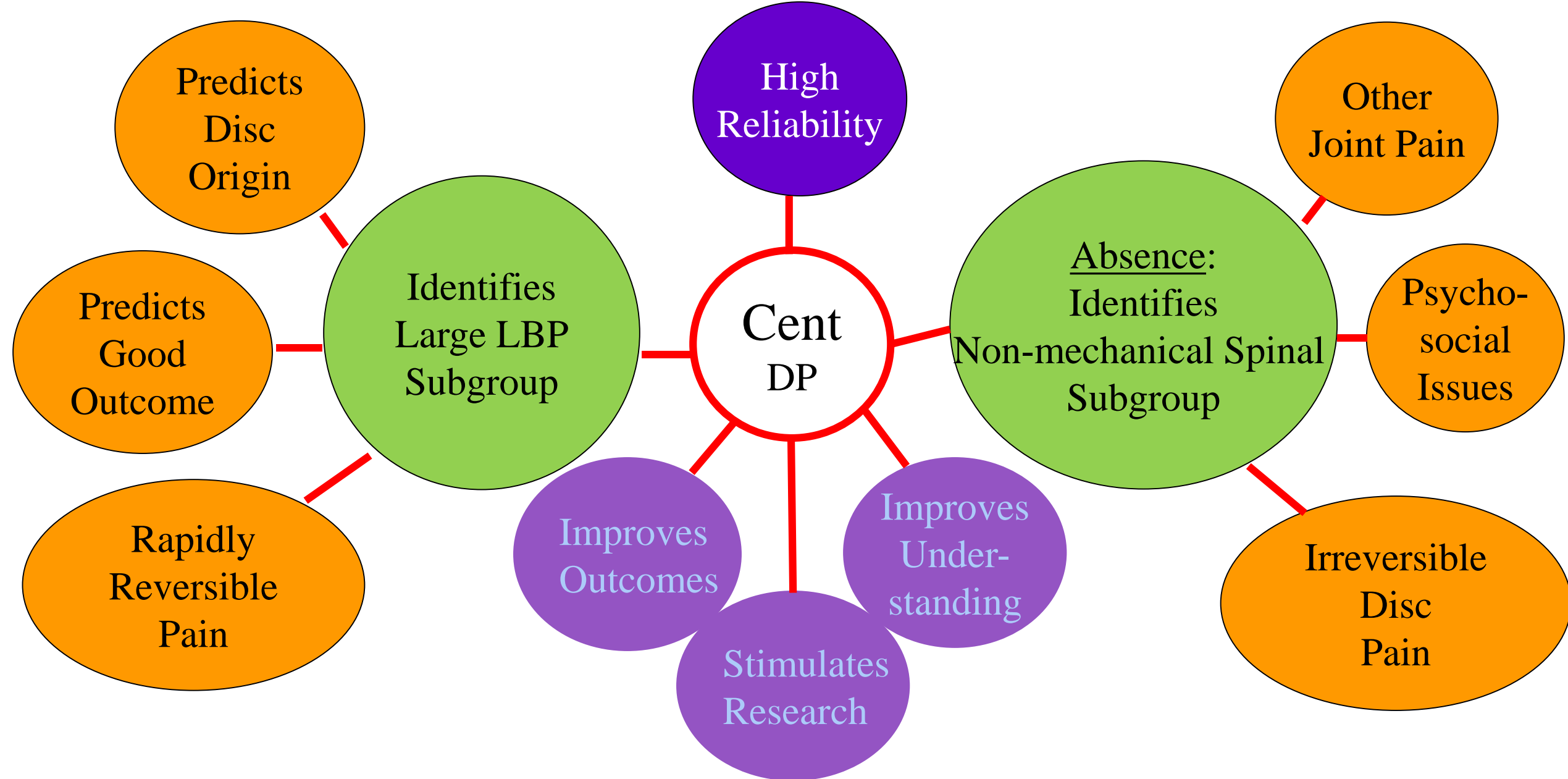
Directional preference

- Movement towards specific direction/s that :
 - Decreases symptoms
 - Centralizes symptoms
 - Improve movement quality
 - Break the movement block

Directional preference

- Prognosis: excellent, whether acute, chronic, LBP only, or sciatica with neural deficits.
- Treatment: directional end-range exercises, posture strategies, patient education.
- Recurrence prevention: excellent with continued use of exercises/posture strategies.
- Pain source: rapidly reversible, likely an intervertebral disc. (Five studies)

Centralization and Directional preference (Cent/DP)



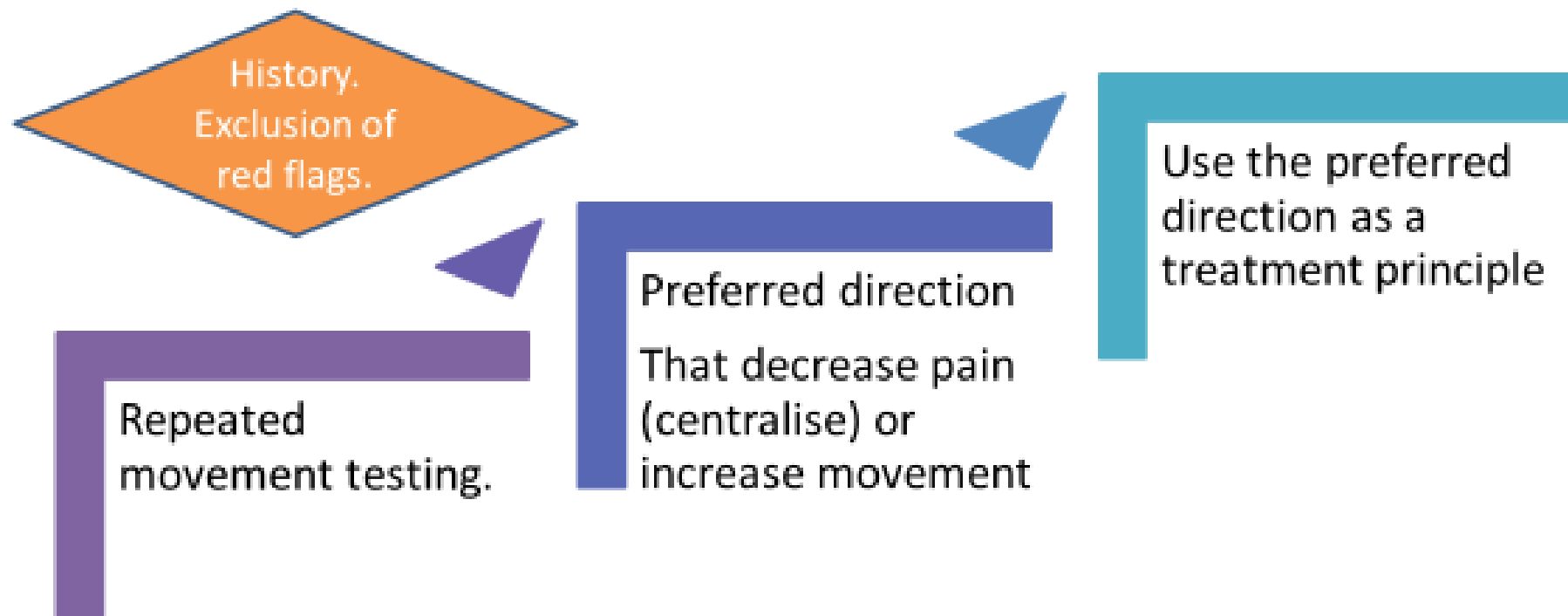
Literature on Centralization and DP

		AINA - 04	
CLARE - 04		WERNEKE-99, 01	
KILPIKOSKI - 02		SUFKA - 98	LASLETT - 05
WERNEKE - 01	LONG - 04	DONELSON - 97	DERBY - 00
RAZMJOU - 00	LARSON - 02	KARAS - 97	SNOOK - 98
FRITZ - 00	SNOOK - 98	LONG - 95	DONELSON - 97
WILSON - 99	DONELSON - 91	ERHARD - 94	SPRATT - 93
SPRATT - 93	WILLIAMS - 91	DELITTO - 93	ALEXANDER - 92
KILBY - 90	SPRATT - 93	WILLIAMS - 91	DONELSON - 90
SPRATT - 90	KOPP - 86	DONELSON - 90	KOPP - 86
Reliability	Direct'l Pref.	Cent/Predctn	Disc Etiology
Randomized Clinical Trials		SCHENK - 03	BRENNAN - 06
		LONG - 04	BROWDER - 07

See Reference List at mdt.org

Mechanical Diagnosis & Therapy

(McKenzie and May 2000)



Symptoms modification procedures

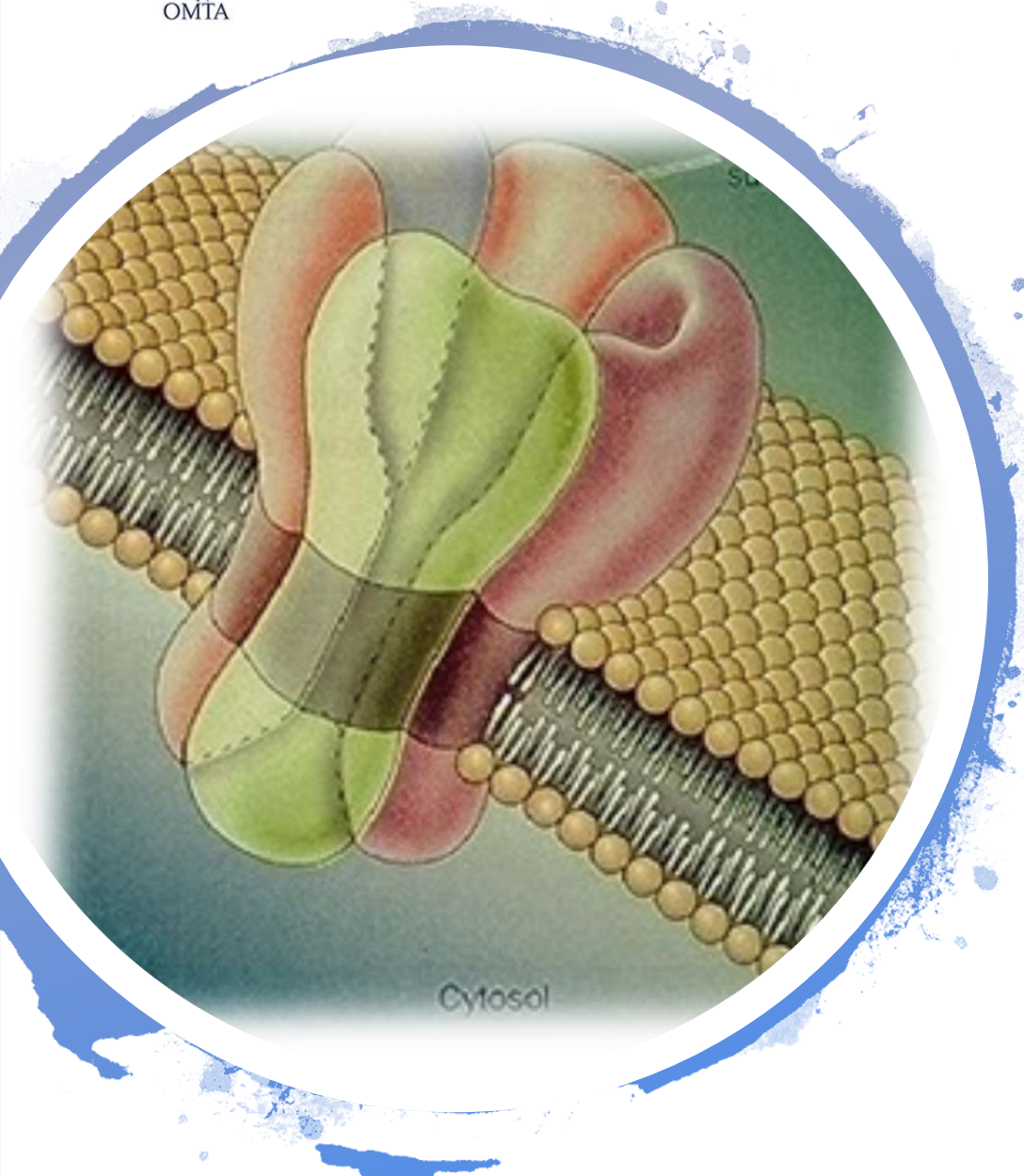
- A method that guides hypothesis generation and treatment selection.
 - Directional preference ... is it?
 - Mobilization with movement
 - Knee : Femoral rotation- tibial rotation- Taping-lateral insole- gluts activation
 - Shoulder

To move or not to
move ...

Neural Tissues



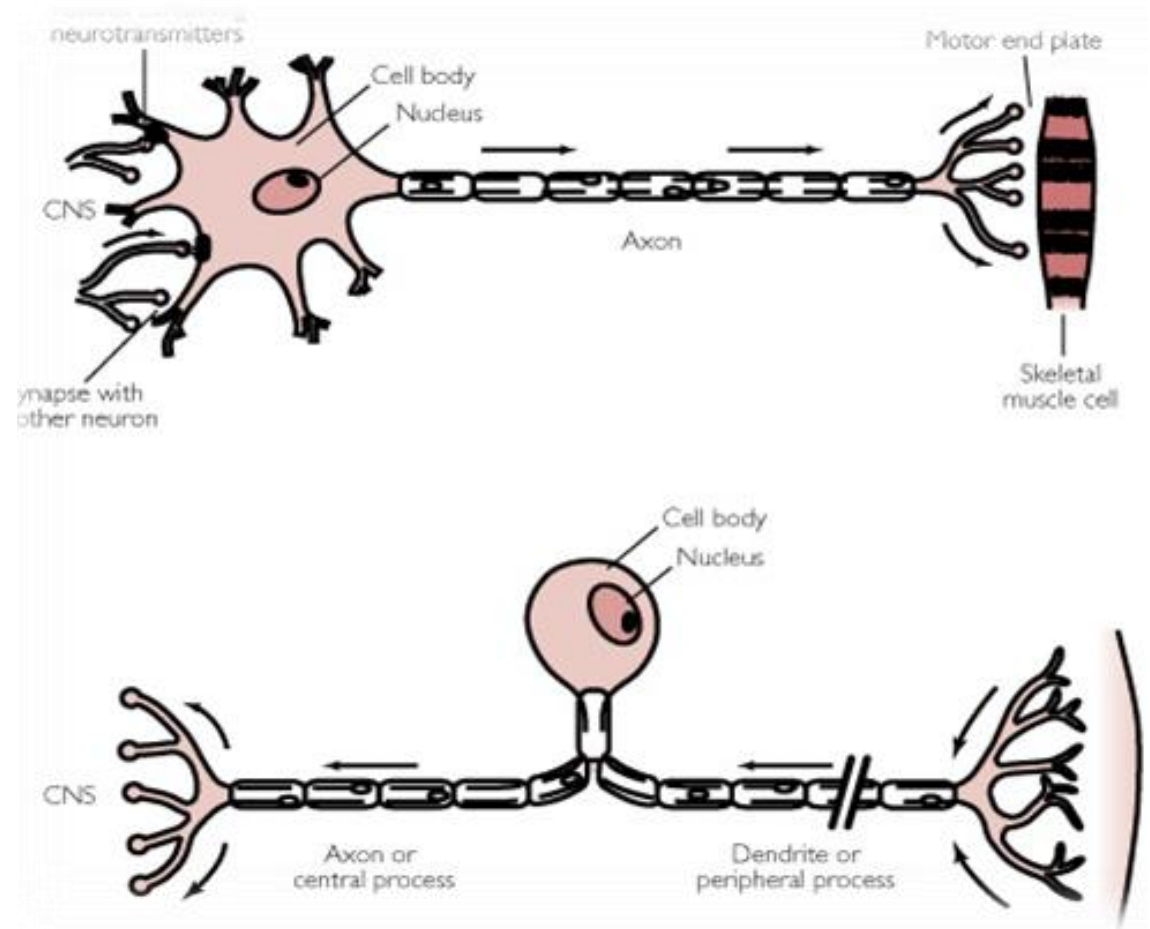
Ion Channels

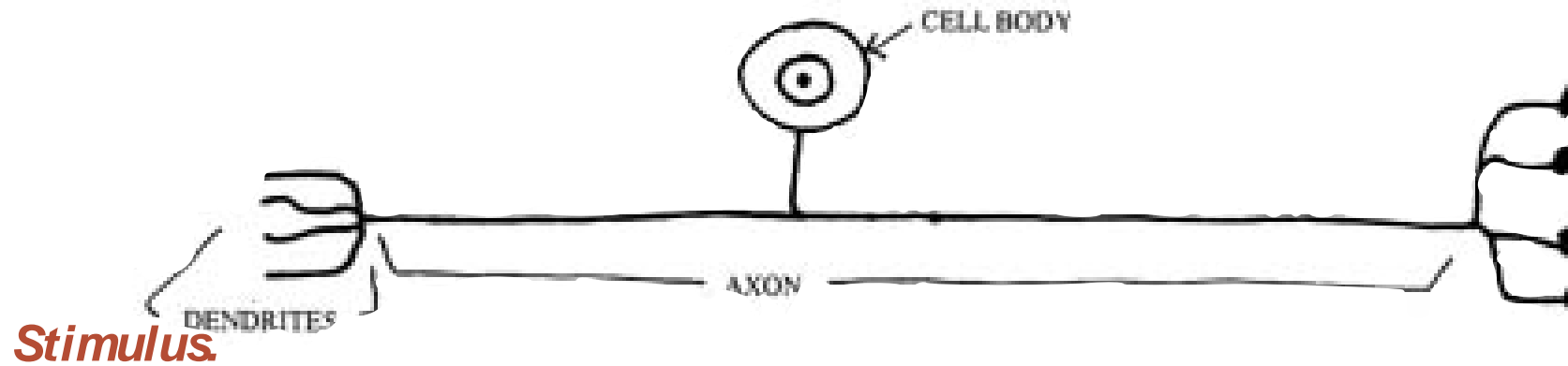


- **Passages** constructed of proteins bound in the **membrane** of neuron (axolemma)
- Holes in the middle will **open and close**, regulating the flow of ions across the membrane of cells
- Different kinds of channels are synthesized on ribosomes around the nucleus – to genetic (DNA) instructions in the cell nucleus and are **transported in axonoplasm and inserted into the axolemma**
- They live for **around 2** days Some stay open for longer

Axoplasmic flow - Nerve Juice

- Transmit proteins and neurotransmitters to and from cell body through the axon.
- **Clean out ION CHANNELS.**
- 5 time more Viscous than water if **flows better when are moving.**
- Essential for health and function of nerves.
- “Nerve Juice” good description to patients to understand they need to move the nerves to squish & move the viscous fluid!





ion channels formation in the cell body.

ion channels travels through the axonoplasm and get embedded within the cell wall.

ion channells number reflect the strength of the stimulus.

ion channels get absorbed by the axonoplasm once the stimulus ceases off.

lack of movement of axonoplasm means ion channels will continue to fire up.

accumulation of abnormal impulses generator sites (AIGS).

- Nervous system takes *20% of the body's circulating oxygen*
- Nerves are sensitive to *oxygen deprivation*
- Combination of undulations and coiled configurations longitudinally and transversely enables the *blood vessels to lengthen with movement*

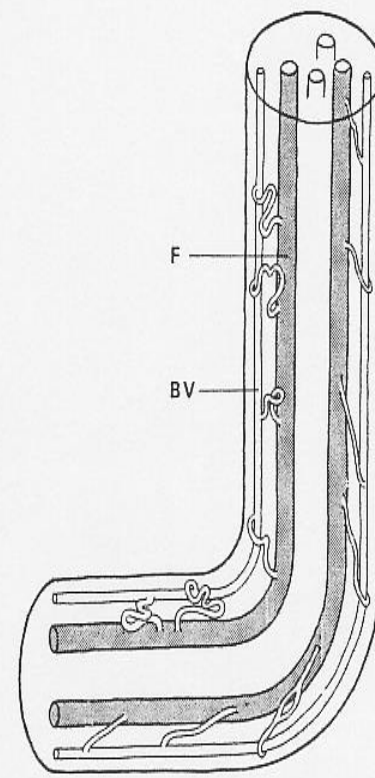


Fig. 1.26 Diagrammatic illustration of the adaptations in feeder vessels to allow intrafascicular movement. F fascicle, BV blood vessel

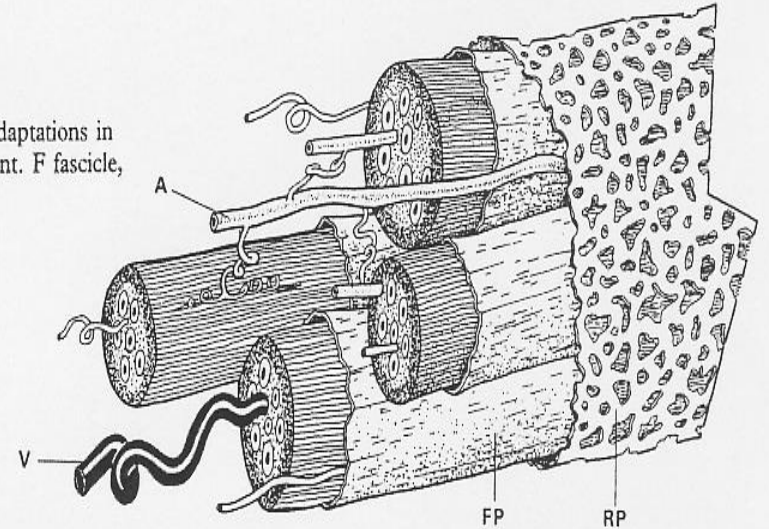


Fig. 1.24 The intrinsic blood supply to a nerve root. A arteriole, FP fascicular pia, RP radicular pia, V venule. Adapted from Parke & Watanabe (1988)

What if ?

- Axonoplasm is not moving?
- Ion channels are accumulating within the Axolemma?
- **What might interrupt this natural process?**



Summary

- Nerve tissues are highly vascular.
- Nerve tissues highly movable.
- Issues with vascularise or movement produce pain.
- Prolonged pain stimulus, lack of appropriate treatment (Movement) and Psychosocial factors might contribute to changes on central system leading to chronic pain.

Clinical NEURODYNAMICS



Few questions...

- What is neurodynamics?
- Where does it fit into your clinical reasoning /assessment process?
- When would you choose to assess neurodynamic?
- What does a +ve ND test mean?
- What do you do rehab / treatment wise if you have a positive ND test?

Neurodynamics.. Crystal clear

- Testing the neural tissue mobility
- Indicate possible: "Interface issues"
- Guides treatment
- Outcome measure!



Nerve Moves !! Few Facts..

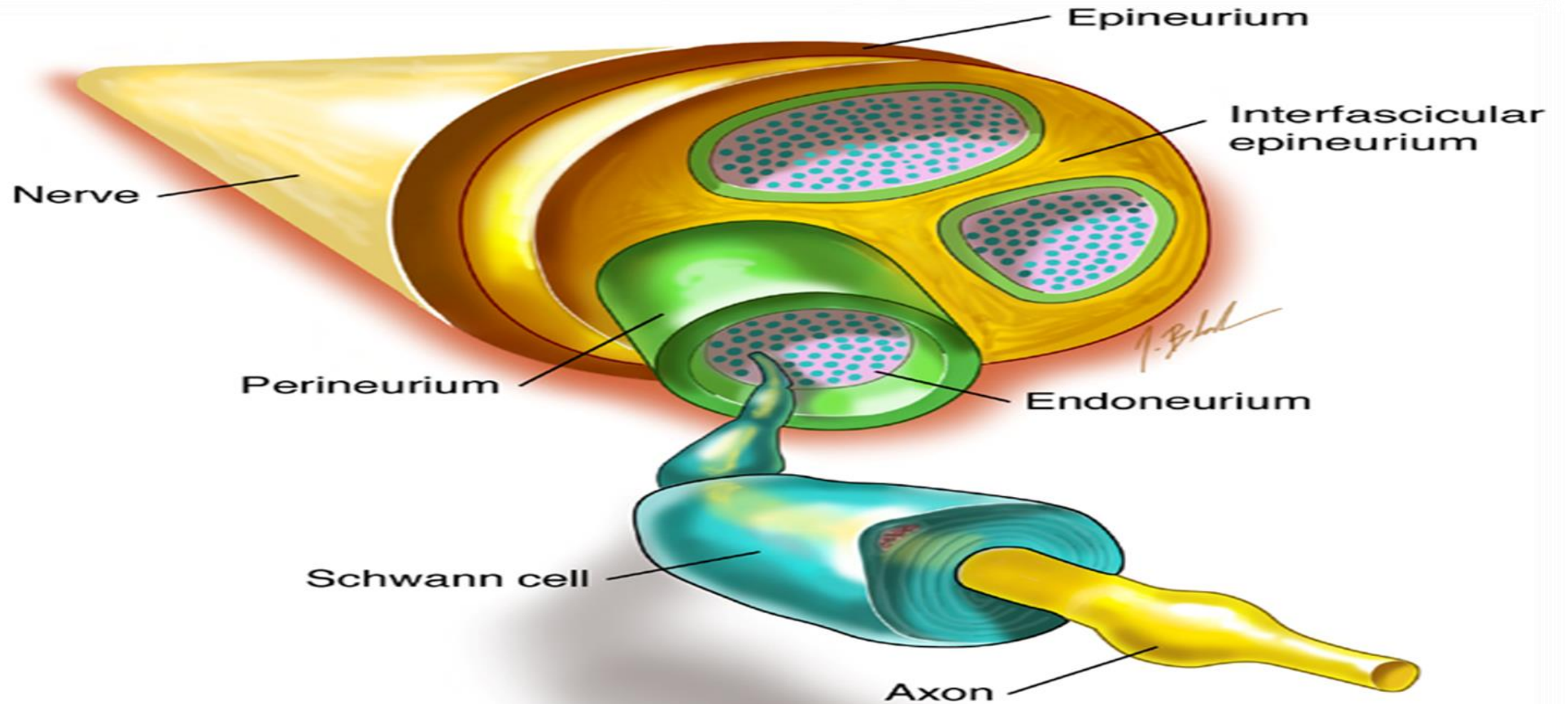
What if nerves Can't move!!
Trapped ..Clinical relevance.

Differential diagnosis !!
Management

What is neurodynamics...

".... the study of the mechanics and physiology of the nervous system and how they relate to each other"

(Shacklock 1995)



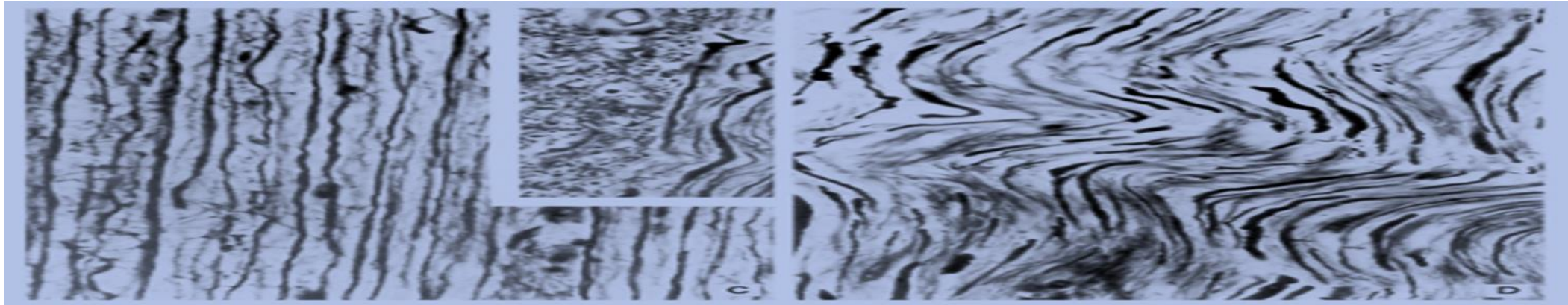
Points for consideration

The mechanical component	The physiological component
<p>The nervous system as a continuum</p> <p>How it is designed for movement</p> <p>Containers and interfaces</p> <p>How the nerves themselves are innervated / can be the source of symptoms</p>	<p>Blood flow</p> <p>Axoplasmic flow</p> <p>Ion channel activity</p>

(Butler 2000)

Movements of the neuro-axis (axis of the CNS), meninges and spinal cord.

- Change in length of spinal cord
- From Flexion to extension 7-10cm
- Posterior wall increases 20-30%
- Anterior wall increases 6-14%



Spinal connective tissue in flexion
i.e elongated parallel fibers

Spinal connective tissue in Extension
i.e elongated parallel folded

Nerve Movement in Literature

- At the elbow median nerve translates/moves 7.3 mm and ulnar nerve 9.8mm during full flexion and extension.

(Wilgis & Murphy 1986)

- The spinal canal is approximately 7cms longer in flexion than in extension. In hypermobile persons it could be 10cms longer.

(Breig 1978)

- Most length changes occur in the cervical and lumbar spine.

(Troup, 1986)

- From wrist and elbow flexion to wrist and elbow extension the median nerve has to adapt to a nerve bed 20% longer.

(Zöch and Reihnsner 1991)

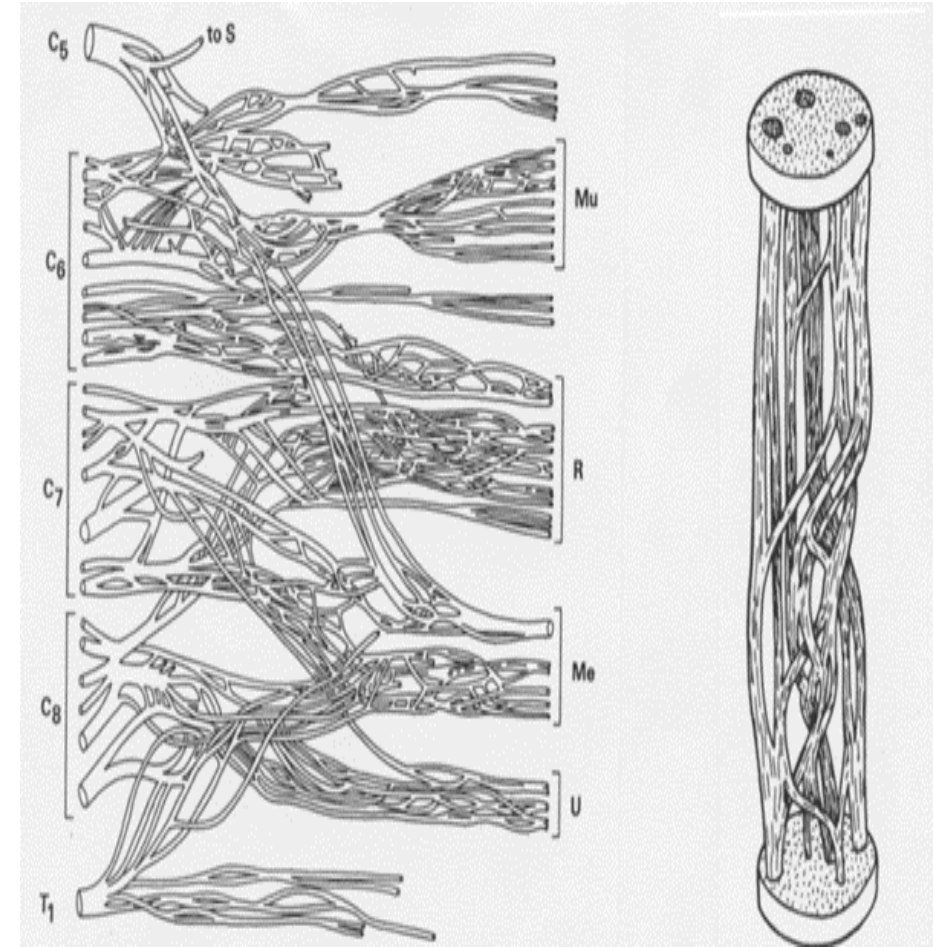
Gliding and extensibility is a normal feature of healthy nerves.

Axons and fascicles do not run in straight lines but will unfold on loading – **concertina effect**

Nervous system allows **folding and unfolding** through the plexus formation

Nervous system **twists and untwists**

(Sunderland, 1978)



Task

- During spine flexion Intraneural pressure will _____ as the cross section _____
- The increased pressure will _____ the amount of blood flow to the nerve fibers
- Blood deprivation may interfere with nerve _____ and affect the axonal system.

Container/Interface Concept

- Nervous system has to adapt movement around and through different tissues
- Different names “mechanical interface”, “container”
- E.g. Piriformis-Hamstring-Ulnar Groove-Tibia and fibula

- Nervous system moves in relation to the surrounding tissues, the surrounding tissues move in relation to the nerve (tunnel principal).
 - Can be associated with restricted soft tissue
 - Can be associated with hypermobile tissue / structures
- Unhealthy surrounding tissues e.g. disc degeneration, muscle changes may influence the nervous system
 - OA joints often less space /osteophytes more likely to have pinching forces applied to nerve/blood supply
- Clinically useful to consider adjacent tissues as interface or 'neural containers'

Chronic constrictive injury

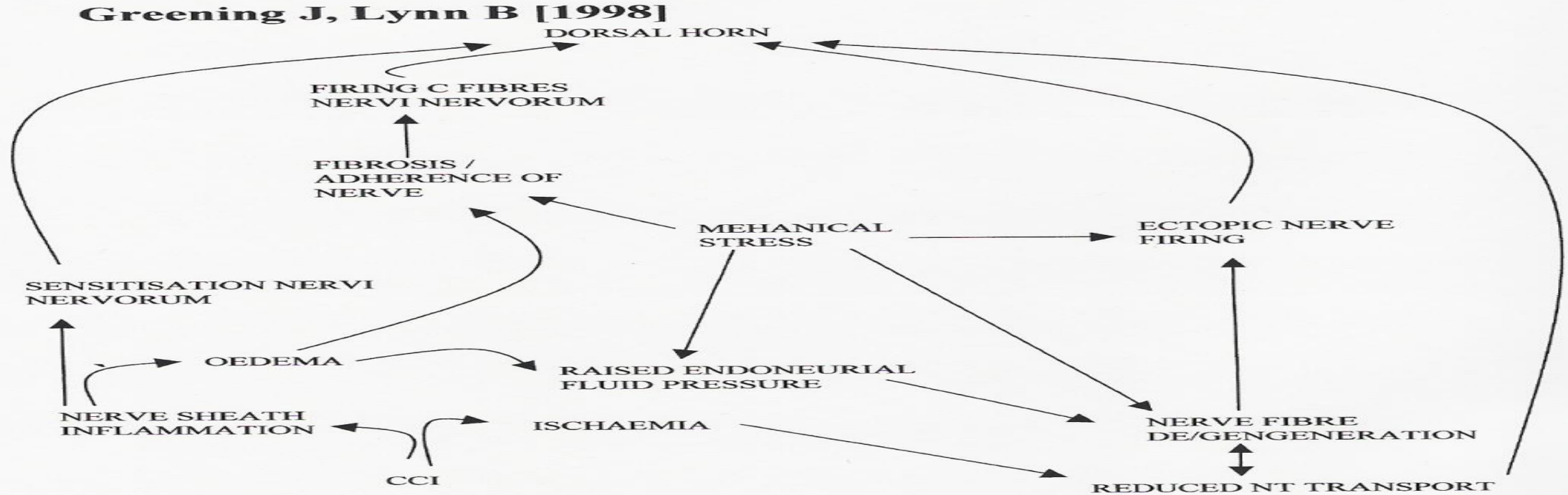


Fig. 2 - Chronic constrictive injury. Neural pathology.
NT = neurotrophin

“Clinical experience suggests that mobilizing surrounding neuronal tissue interfaces with techniques to optimise postural position and restore neural gliding will relieve compressive effects and help restore neuronal function”

“Clinical strategies to minimize peripheral C fibre activity remain important in the management of painful neuritis”

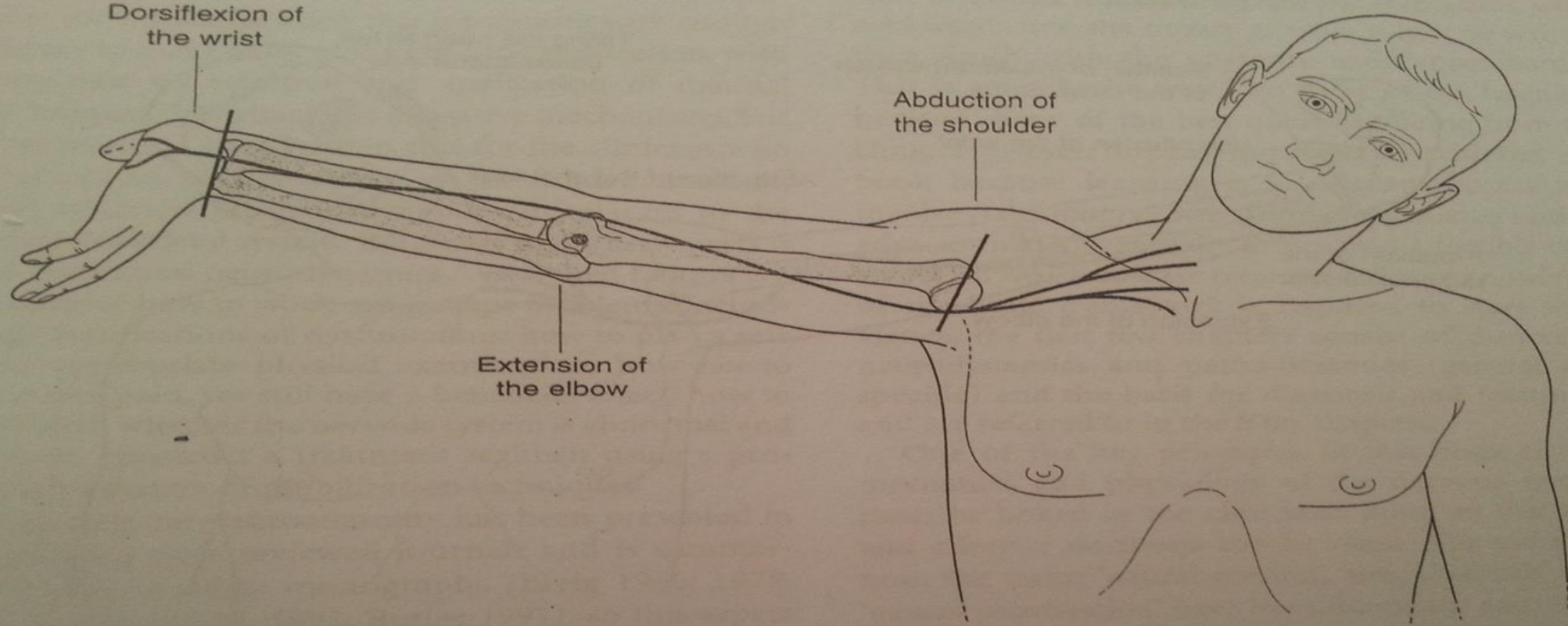


SUMMARY

- Our nerves move
- Nerves withstand tension-compression
- Movement is essential for healthy Nerves
- Specific Vs/General Exercise.
- Lack of movement could occur:
- Centrally . Spinal cord -Nerve Root
- Peripherally (Interface)
- Lack of Movement Affects:
 - Neural tissue mobility
 - Blood supply
 - Nerve Juice mobility . Metabolism
 - Chronic Pain

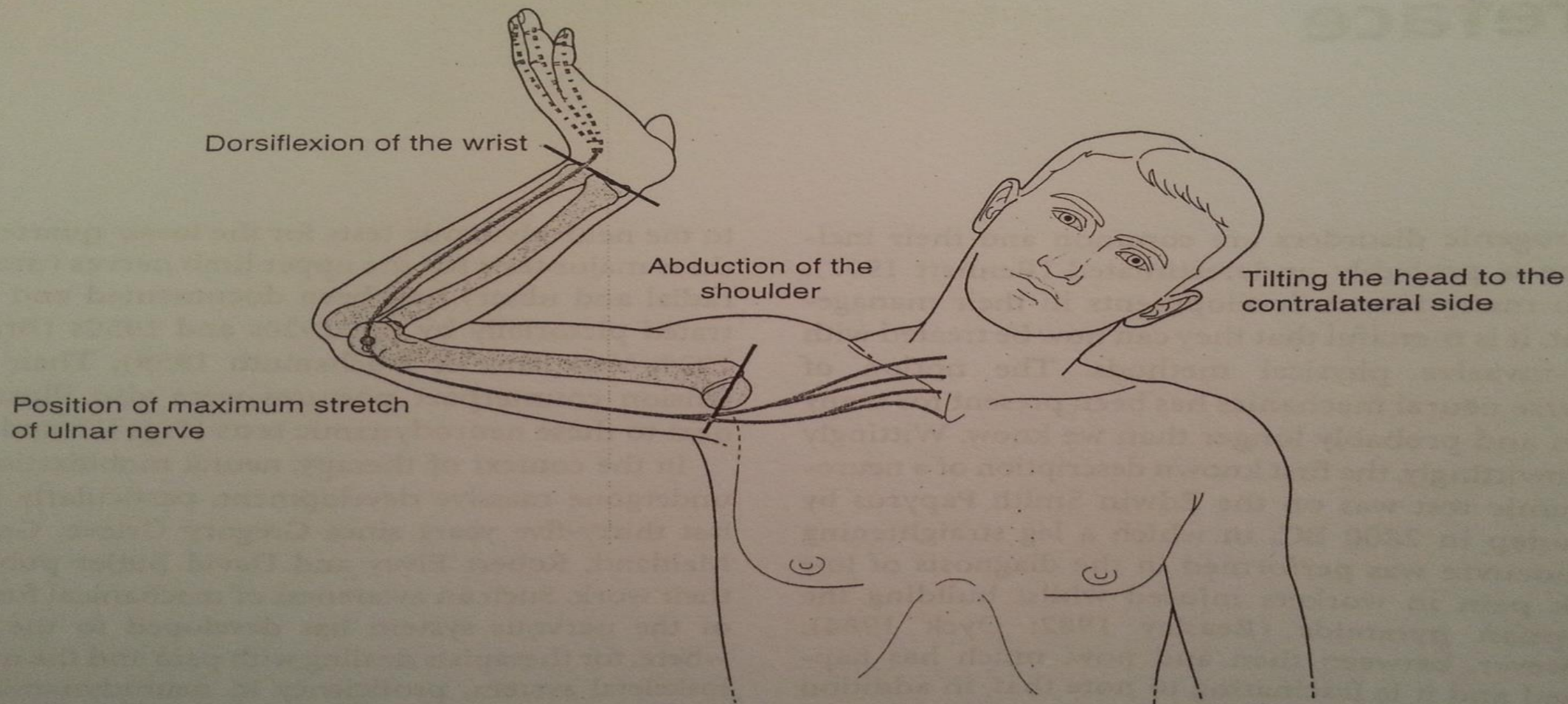
Using Neurodynamic (ND) Testing

- Moving the nerve tissues
- Put it under stresses
- Observe the points where tension is produced.
- Relate to history and SIN Factors.
- NOW is it central or peripheral?

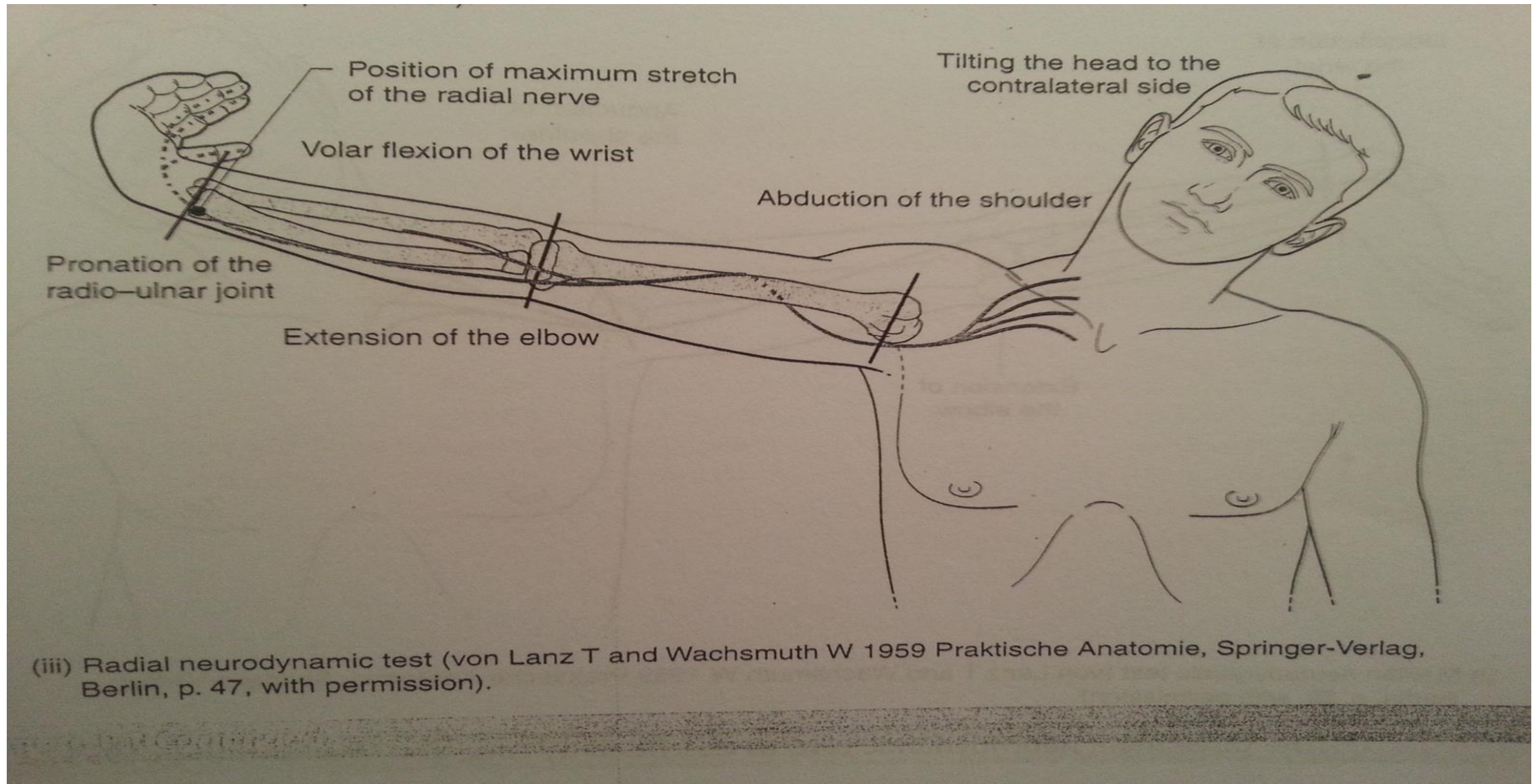


(i) Median neurodynamic test (von Lanz T and Wachsmuth W 1959 Praktische Anatomie, Springer-Verlag, Berlin, p. 38, with permission).

The three main neurodynamic tests as described by Lanz and Wachsmuth in 1959.



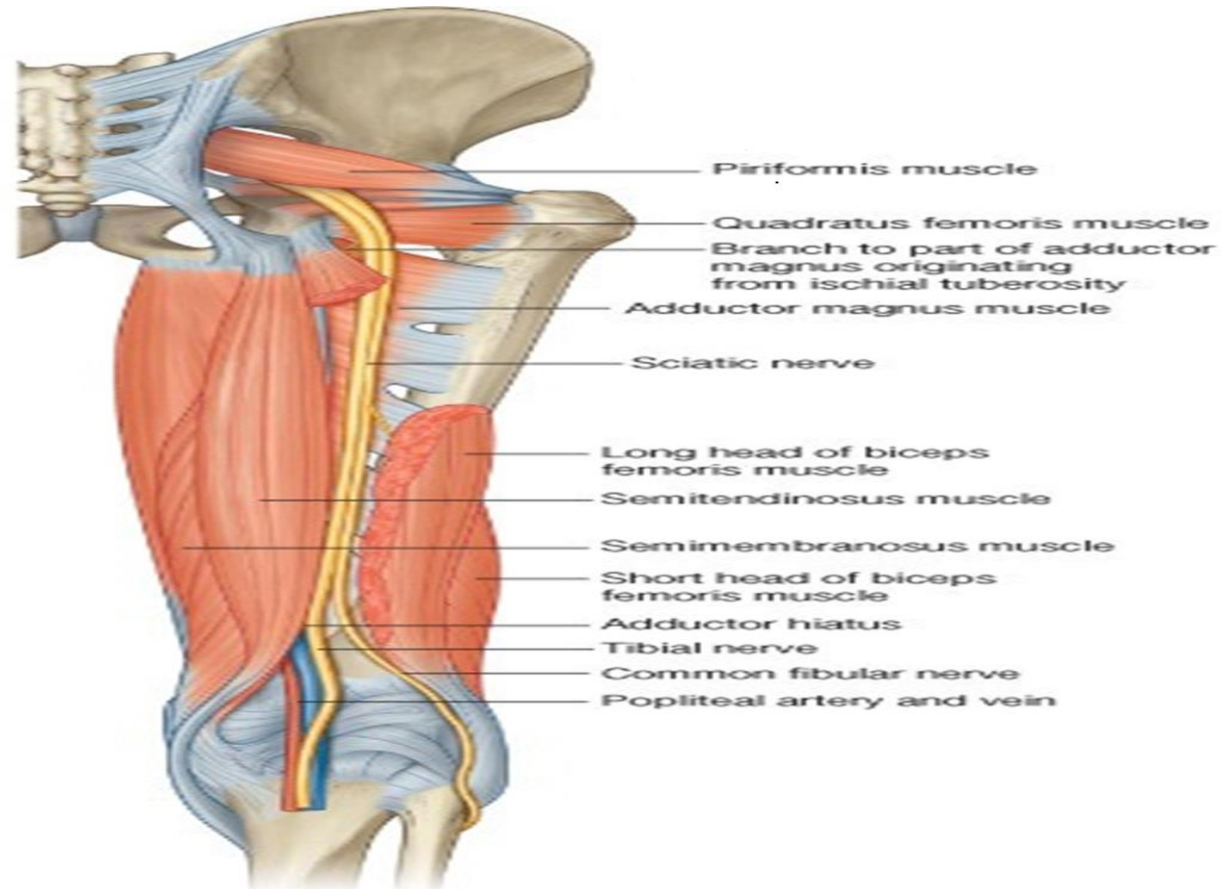
(ii) Ulnar neurodynamic test (von Lanz T and Wachsmuth W 1959 Praktische Anatomie, Springer-Verlag, Berlin, p. 41, with permission).



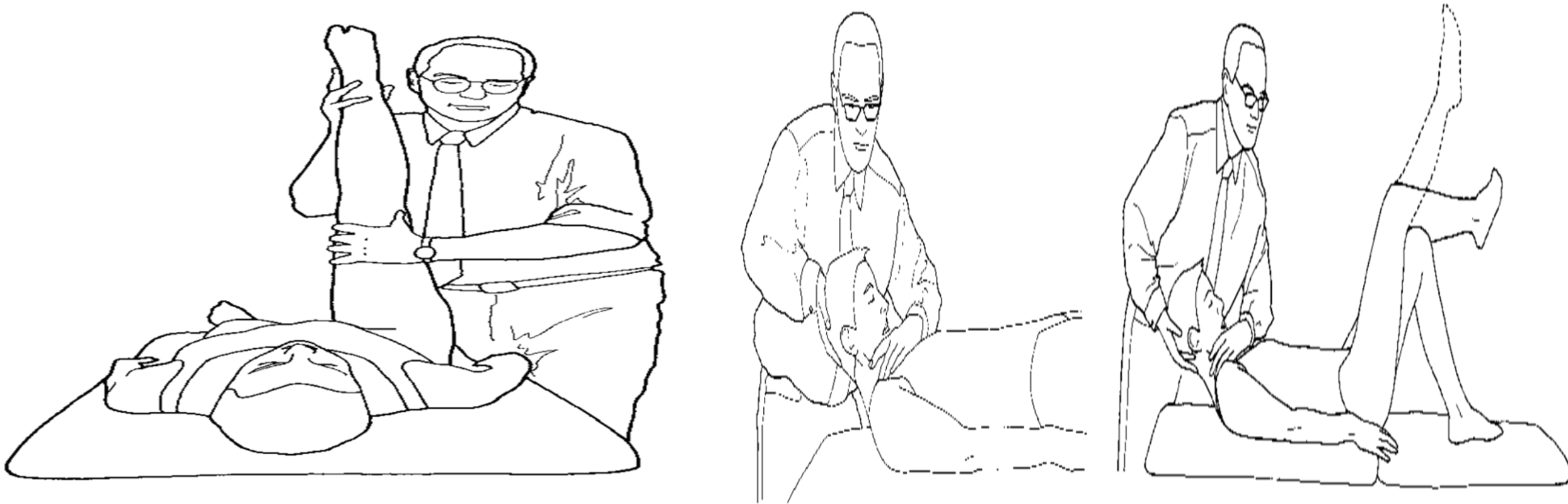
Possible Treatment strategies

- Sliders
- Mobilisation techniques
- Soft tissue mobilisation (Nerve Juice)

Lower Limb Tests



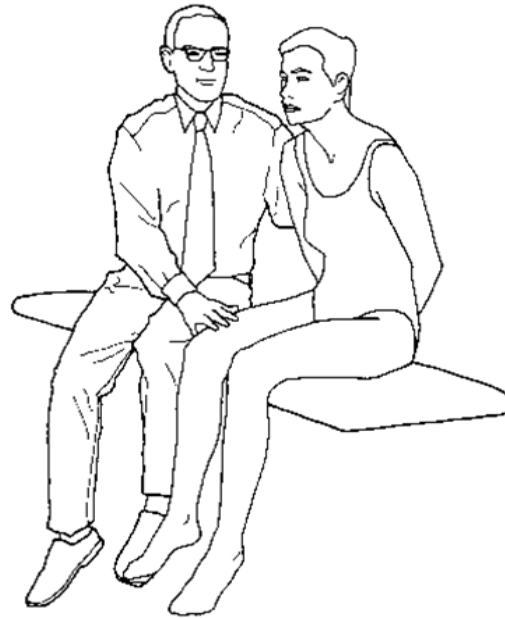
SLR



Slump Test



Starting position

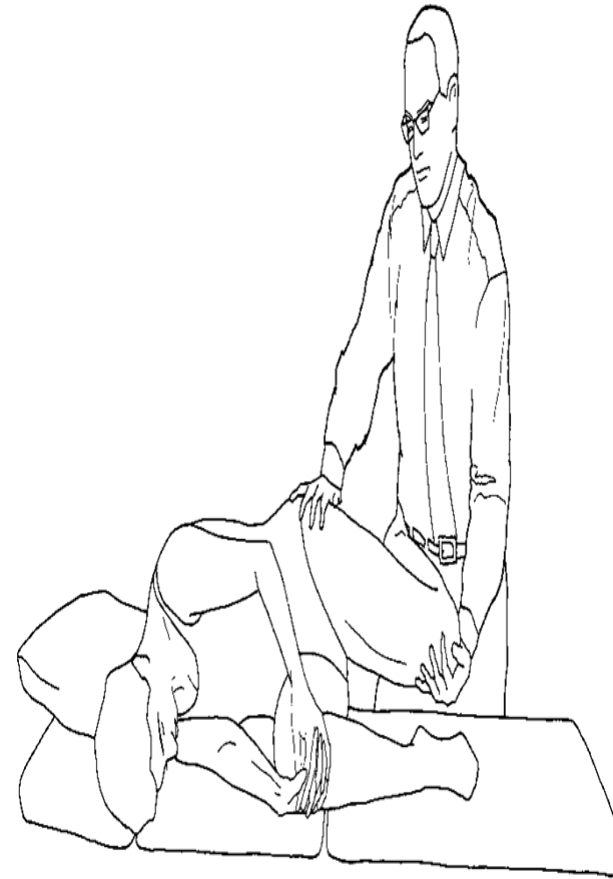
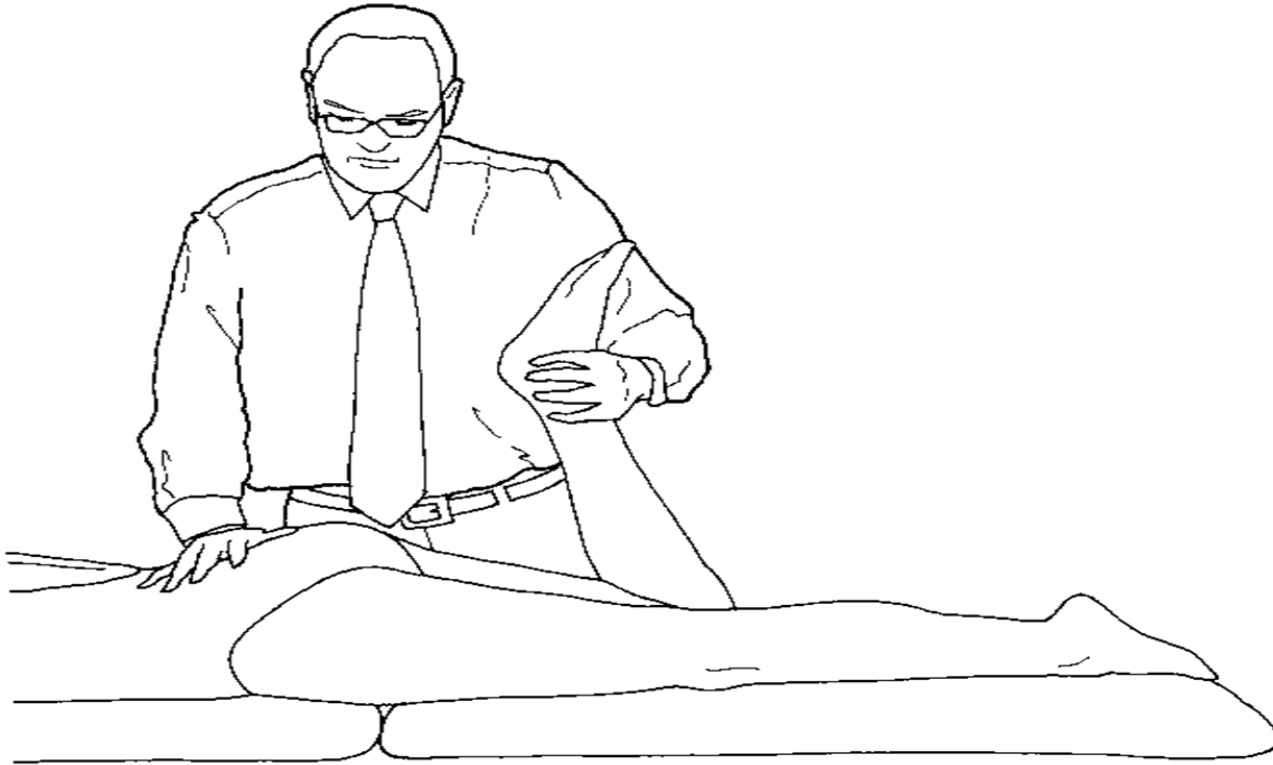


Spine flexion



Cervical flexion

Femoral NTT

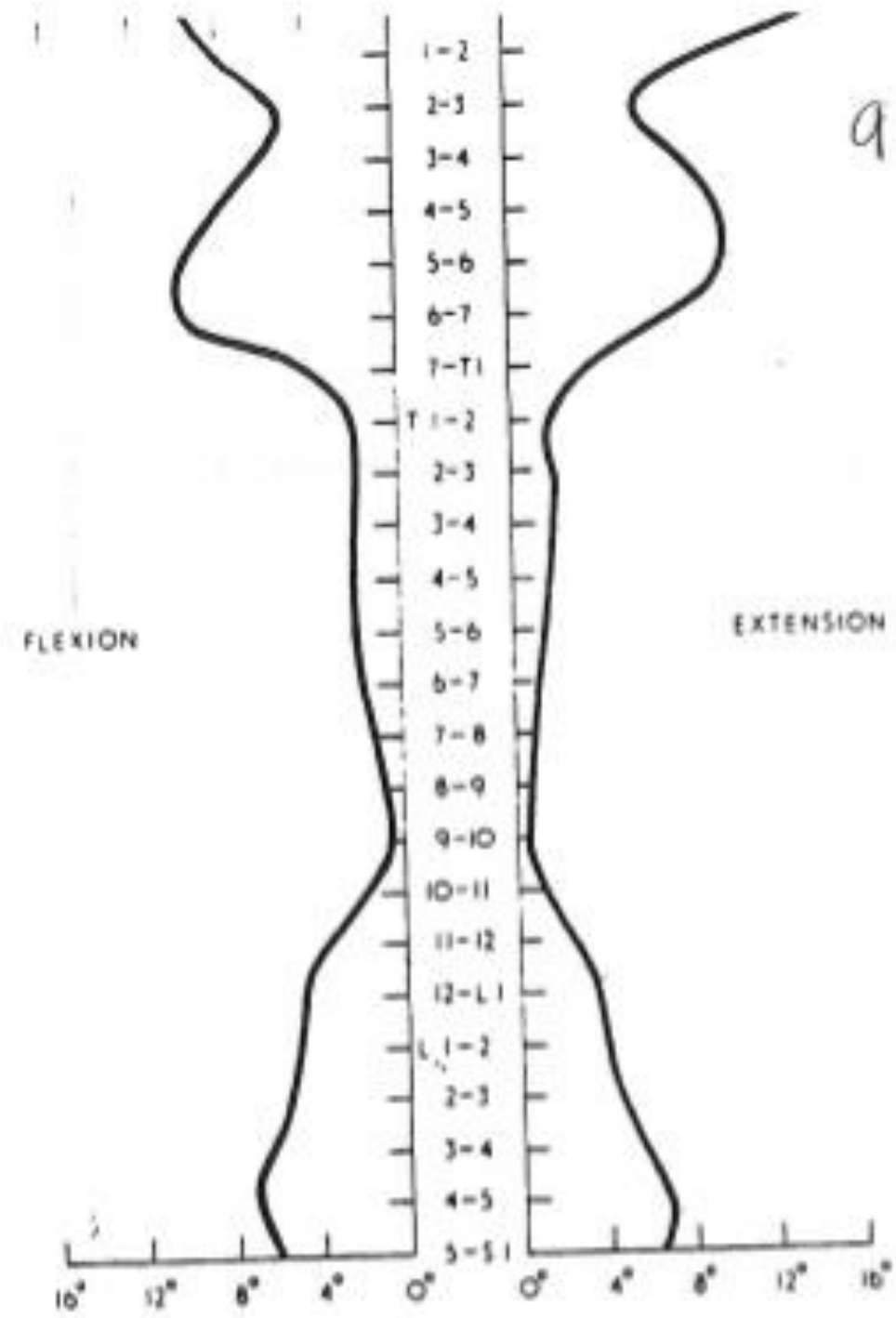


To move or not to
move ...

Articular structures



Average segmental mobility



Average segmental mobility

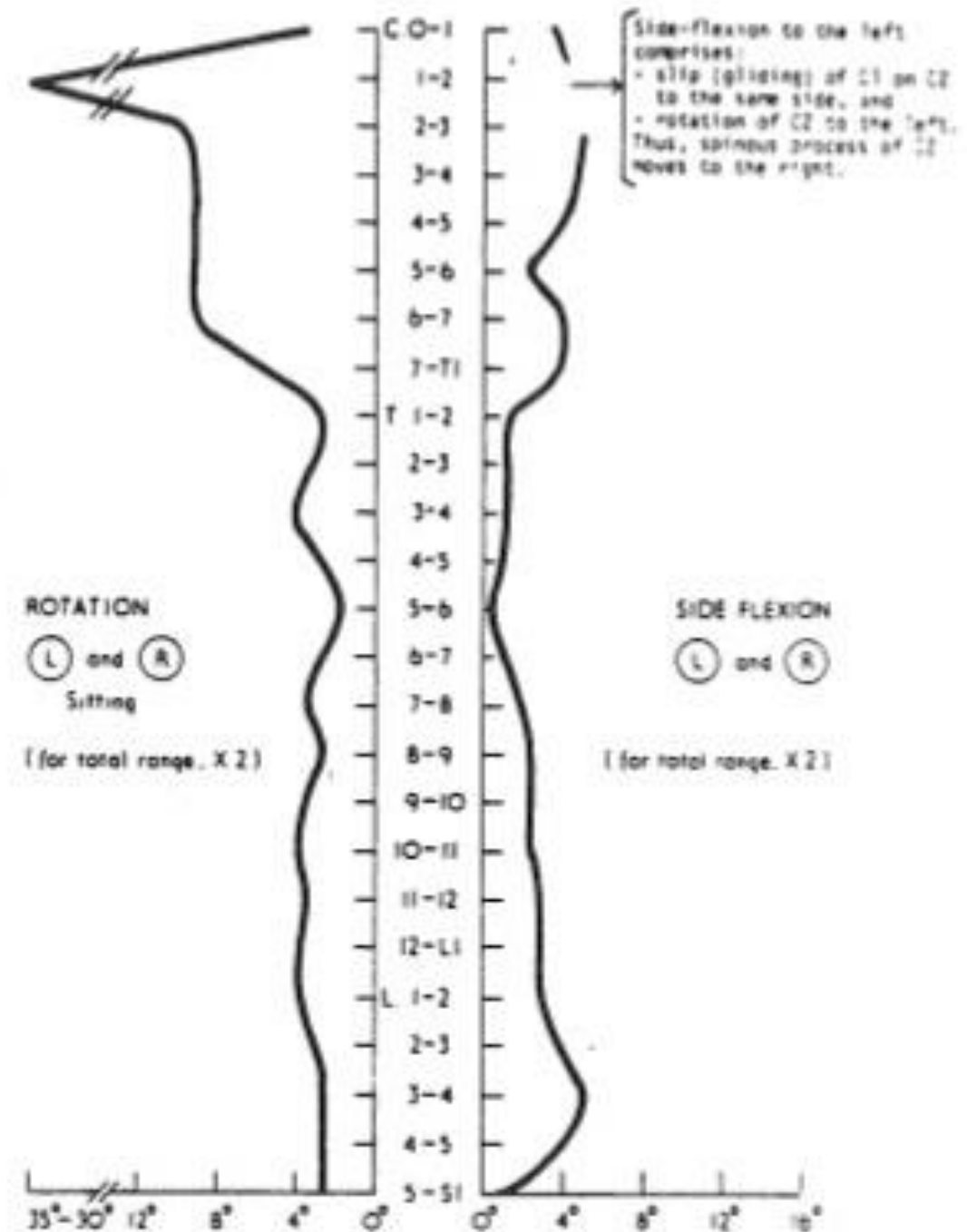


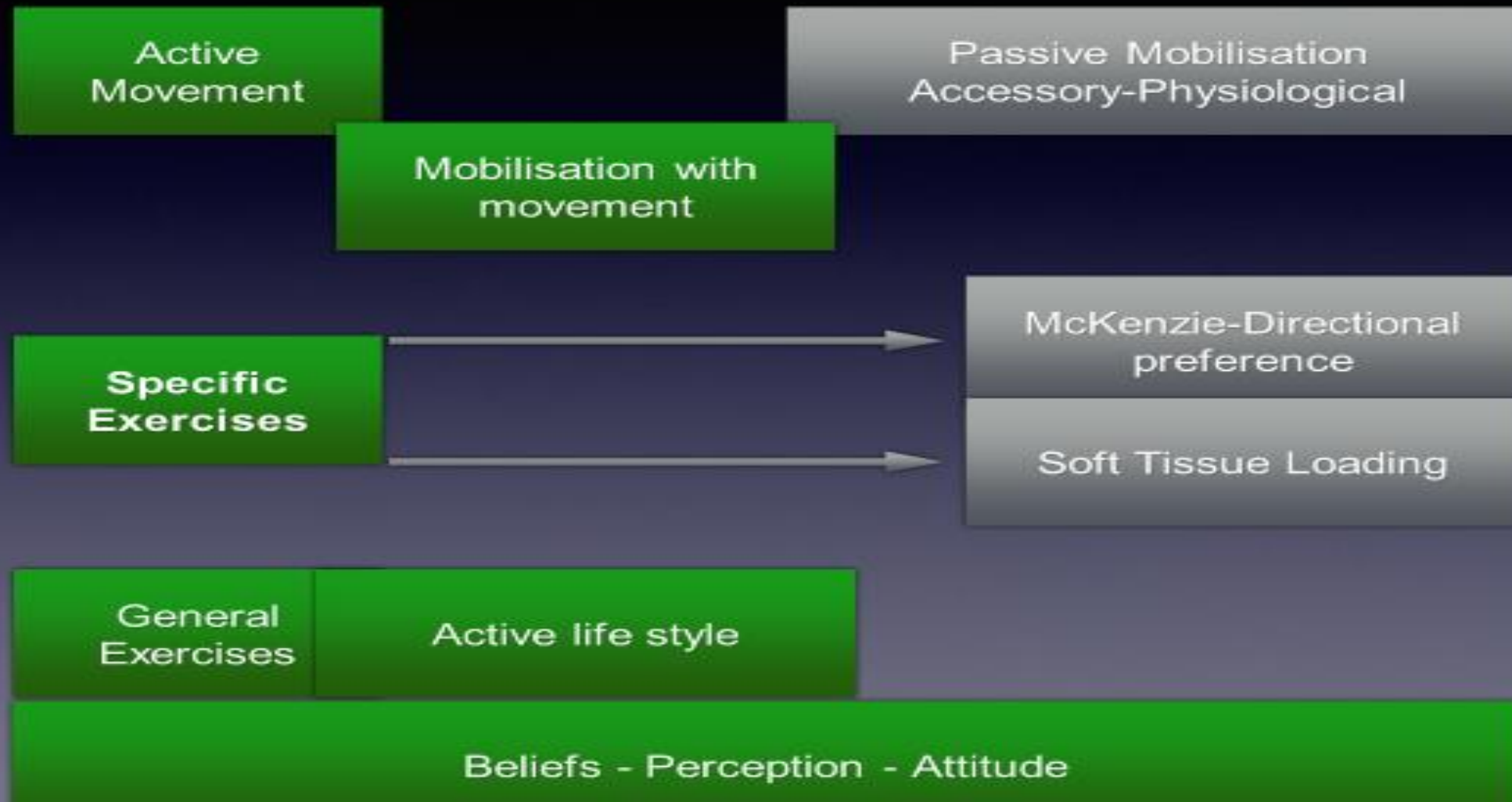
Fig. 2.7. Average range of segmental movement.

Mobilization with movement (MWM) NAGs and SNAGs

Brian Mulligan

The theory of train and the track





PRACTICAL LAB

PAIVM/PPIAVM /MWM

- Cervical Spine
- Thoracic Spine

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