

# **The McKenzie Institute International**

## **CENTRE FOR POSTGRADUATE STUDY IN MECHANICAL DIAGNOSIS AND THERAPY**



### **PART C**

### **MECHANICAL DIAGNOSIS AND THERAPY**

### **ADVANCED LUMBAR SPINE**

### **& EXTREMITIES – LOWER LIMB**

**Presented By:**

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# *Robin McKenzie*

## **Founder of the McKenzie Institute International**

*"My patients taught me all I know"*

Robin McKenzie transformed the world of physiotherapy and the care of patients with musculoskeletal problems. He devised a classification system that could be applied to all spinal and non-spinal musculoskeletal problems and was the first clinician to recognise the clinical phenomena of directional preferences and centralisation. He put the patient at the centre of what became known as the McKenzie Method of Mechanical Diagnosis and Therapy. His concepts and clinical teachings, which are supported by strong research evidence, have become established principles in the care of musculoskeletal patients.

He received many honours during his life. Twice decorated by the New Zealand Government, he was also awarded life Fellowship by The Chartered Society of Physiotherapists (UK), the American Physiotherapy Association, the New Zealand Society of Physiotherapists and in 1983 was elected to membership in the International Society for the Study of the Lumbar Spine. What gave him the greatest pleasure however were the many letters he received from around the world from ordinary patients thanking him for their recovery.

Robin McKenzie was also a prolific author. His first book, "Treat Your Own Back", was written specifically for patients, empowering them to take control of their pain. Other self-treatment books followed as well as texts on the assessment and treatment of the lumbar and cervical spine and the extremity joints.

The McKenzie Institute International continues to expand the delivery of care to patients and the education of healthcare professionals worldwide. There are now branches in 28 countries throughout the world and international courses taught in many more.

Robin McKenzie was a great visionary in the field of musculoskeletal care. His influence continues to grow and his work will forever stand the test of time.





# THE MCKENZIE INSTITUTE INTERNATIONAL

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## INTERNATIONAL VISION

MDT to be the first choice worldwide for the assessment, treatment, education and empowerment of patients with musculoskeletal disorders.

## INTERNATIONAL MISSION STATEMENT

Educate in and promote the principles of the management of musculoskeletal disorders as developed and described by Robin McKenzie.

The Mission shall be achieved by educating and promoting the principles to:

- Administrators
- Clinicians
- Funders
- General Public
- Healthcare Professionals
- Legislators/Policy Makers
- Researchers
- Other

*The McKenzie Institute International is a Charitable Trust registered in New Zealand.*



## MECHANICAL DIAGNOSIS AND THERAPY

### SEQUENCE OF INSTRUCTION AND TRAINING

Part A  
**The Lumbar Spine**  
(28 hours)

Part B  
**The Cervical and Thoracic Spine**  
(28 hours)

Part C  
**Mechanical Diagnosis  
and Therapy  
Advanced Lumbar Spine &  
Extremities – Lower Limb**  
(28 hours)

Part D  
**Mechanical Diagnosis  
and Therapy  
Advanced Cervical & Thoracic  
Spine & Extremities – Upper Limb**  
(28 hours)

Credentialling Examination  
(8 hours)

Diploma in Mechanical  
Diagnosis & Therapy



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## PART C

# MECHANICAL DIAGNOSIS AND THERAPY: ADVANCED LUMBAR SPINE & EXTREMITIES – LOWER LIMB

### **COURSE GOALS**

As its name implies, this course focuses on advanced Mechanical Diagnosis and Therapy for the lumbar spine and an introduction to the application of Mechanical Diagnosis and Therapy for the lower extremities. The goals of this course are that you build on the knowledge and skills that you gained from the MDT Part A by improving your clinical reasoning, enhancing your patient management skills and expanding your knowledge base to include the extremities.

**Following attentive participation and completion, this course will provide participants with the knowledge, skills and abilities to:**

#### **Lumbar Spine**

1. Identify, analyse and discuss common problems encountered in the application of Mechanical Diagnosis and Therapy for the lumbar spine.
2. Analyse and discuss the MDT assessment in a biopsychosocial framework and explore how it is used to differentially diagnose and determine classification.
3. Analyse and discuss the MDT management principles of Derangement, Dysfunction and Postural Syndrome with focus on reassessment, the progression of forces, recovery of function and prophylaxis.
4. Perform MDT procedures for the lumbar spine at an advanced level and be able to identify and analyse problems with their application.
5. Recognise the criteria of the subgroups of OTHER and understand how to differentiate from the Syndromes
6. Analyse and discuss case studies of patients presenting with lumbar spine symptoms to differentiate and determine classification and management.

#### **Lower Extremities**

1. Describe the major epidemiological factors associated with lower extremity conditions.
2. Describe and discuss the current evidence base for the use of MDT for lower extremity musculoskeletal disorders.
3. Describe and differentiate the characteristics of Derangement, Dysfunction and Postural Syndromes as they present in the lower extremity.



4. Perform a spinal assessment and analyse the findings to differentiate between symptoms that are lumbar spine in origin or are arising from lower extremity structures
5. Perform and analyse MDT assessments for lower extremity musculoskeletal disorders and determine the presence of McKenzie Syndromes.
6. Design appropriate management programmes for patients who present with Derangement, Dysfunction and Postural Syndromes.
7. Recognise the presentation of the subgroups of OTHER in the lower extremity, and understand the criteria for diagnosis and management options.
8. Analyse and discuss case studies of patients presenting with lower extremity symptoms to differentiate, and to determine classification and management.

**Please Note:**

*The material contained in this manual builds on the content taught on the Part A course. It is recommended that the Part A manual is used in conjunction with this manual.*

*It is not intended that all the material contained in this manual is covered during the hours of the course. You may be directed by the Instructor to read some of the material and complete some of the Quiz activities in your own time.*

*The order of the delivery of the material may not necessarily follow the order that it is presented in the manual.*



***[INTENTIONALLY BLANK]***



# MODULE ONE:

## PROBLEM AREAS AND PROBLEM SOLVING

### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Identify and discuss the common problems encountered with the McKenzie assessment and classification of patients who present with lumbar spine disorders.
2. Identify, analyse and discuss the common problems with the MDT management of patients who present with lumbar spine disorders and use MDT clinical reasoning principles to identify appropriate solutions.
3. Compare and contrast individual areas of difficulty with those commonly encountered.



**Objective 1:**

**Identify and discuss the common problems encountered with the McKenzie assessment and classification of patients who present with lumbar spine disorders.**

## **PROBLEM AREAS**

### **Assessment**

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### **Classification**

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### **Management**

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### **Reassessment**

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### **Procedures**

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### **Other Problem Areas**

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**Objective 2:** Identify, analyse and discuss the common problems with the MDT management of patients who present with lumbar spine disorders and use MDT clinical reasoning principles to identify appropriate solutions.

**Objective 3:** Compare and contrast individual areas of difficulty with those commonly encountered.

## ASSESSMENT

**History:**

At the completion of the history you should have a hypothesis on:

- 1.
- 2.
- 3.
- 4.

**Physical Examination:**

List 3 baselines you can identify in the Physical Examination:

- 1.
- 2.
- 3.

**Repeated movements:**

How can you determine that you are at end range?

## TERMINOLOGY

**Terms used for Recording:**

(a) During the repeated movements

(b) After the repeated movements

(c) Words which indicate a "RED" light

(d) Words which indicate a "GREEN" light

(e) Words which indicate an "AMBER" / "YELLOW" light

## CENTRALISATION

**Centralisation:**

List 3 things centralisation determines:

- 1.
- 2.
- 3.



<b>CLASSIFICATION</b>	
<b>Mechanically Inconclusive:</b>	
(a) What criteria allow us to make this classification?	
(b) What does a Mechanically Inconclusive classification indicate regarding prognosis?	
<b>Anterior/Posterior Derangement:</b>	
(c) Describe the Worse/Better section for a typical POSTERIOR Derangement	W B
(d) Describe the Worse/Better section for a typical ANTERIOR Derangement	W B
(e) What is the typical pattern of movement loss in an Anterior Derangement?	
(f) What is the “provocation test” for Anterior Derangement?	
<b>Dysfunction:</b>	
(g) What percentage of spinal patients are able to be classified as Dysfunction?	
(h) What factors contribute to this proportion?	
<b>MANAGEMENT – EDUCATION COMPONENT</b>	
<b>Patient instructions:</b> What analogies might be effective?	
<b>Importance of posture:</b> How can we achieve commitment by the patient?	
<b>Patient Participation:</b> How can we involve the patient in the decision making process?	



<b>MANAGEMENT – MECHANICAL COMPONENT</b>	
<b>Exercises not taken far enough:</b>	
(a) An end range response of Decrease or Abolish, but No Better indicates what?	
(b) An end range response of Increase, No Worse indicates what?	
(c) An end range response of increase or produce, remains Worse indicates what?	
<b>Inadequate time for reduction:</b> What clues suggest more time is required for reduction to occur?	
<b>Presence of a relevant lateral component:</b>	
(a) What clues in the history and the physical examination suggest the presence of a relevant lateral component?	
(b) If it is present how does it alter management?	
<b>REASSESSMENT</b>	
<b>If Improvement is not maintained:</b> How is maintenance of the reduction accomplished?	
<b>Recovery of function:</b>	
(a) Why is it important?	
(b) The goals of recovery of function are:	1. 2. 3. 4.
<b>Prophylaxis:</b> Why is it important?	



## FORCE PROGRESSION AND FORCE ALTERNATIVES

<b>Application of Clinician Techniques:</b>	
(a) When do we apply clinician procedures?	
(b) Clinician procedures can be used to confirm:	1. 2.
(c) When would you consider a Force Alternative?	

### Notes:

[illegible]

## MODULE TWO:

### ASSESSMENT AND DIFFERENTIATION

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Demonstrate an advanced understanding of the clinical significance of the components of the MDT assessment in a biopsychosocial context.
2. Demonstrate an advanced understanding of how the findings of the MDT assessment assist in differentiating between symptoms that are lumbar spine in origin or are arising from lower extremity structures.
3. Analyse how the MDT assessment helps to identify precautions and contraindications to mechanical therapy in patients presenting with lumbar spine symptoms.
4. Demonstrate competence in using McKenzie terminology when completing a Lumbar Assessment form.
5. Analyse a completed McKenzie Lumbar Assessment form to determine the correct McKenzie classification.



**Objective 1:** Demonstrate an advanced understanding of the clinical significance of the components of the MDT assessment in a biopsychosocial context.

**Objective 2:** Demonstrate an advanced understanding of how the findings of the MDT assessment assist in differentiating between symptoms that are lumbar spine in origin or are arising from lower extremity structures.

**Objective 3:** Analyse how the MDT assessment helps to identify precautions and contraindications to mechanical therapy in patients presenting with lumbar spine symptoms.

## **ASSESSMENT FORMS**

It is essential that we strive towards *uniformity* in the completion of the lumbar Assessment forms, along with accuracy in the mechanical assessment itself. We tend to believe that the way we record information will be readily understood by all, but you may be surprised to know that this is far from the case.

**HISTORY:** Patient response is recorded but qualified by the therapist when necessary.

Remember the aims of taking the History are to:

- Propose a provisional classification;
- Determine the stage of the disorder;
- Establish the functional limitations and the patient's response to them;
- Identify the presence of serious pathologies or contraindications;
- Determine the severity of the problem which will guide the physical examination;
- Determine baseline measurements.

As a general rule, patients whose symptoms are of recent onset will provide information more accurately and concisely. The more chronic the condition the more difficult it is to obtain accurate information (patients often lose objectivity and have attempted to control their activities and positions, thus rendering the examination more difficult). The repetition and re-phrasing of questions can be very important, but you need to draw-out the information without biasing the patient's response. Gather only essential information and do not get bogged down with trivia - in other words, know the reason behind every question you ask. The ideal completed assessment form is one where the maximal amount of relevant information is conveyed as concisely as possible.

**In general, when the patient's responses are not clear determine the relative worsening/improvement in the patient's condition with various activities. Determine the effects of these activities and positions on a short term versus prolonged basis. Remember to keep repeating and re-phrasing the questions until a more accurate picture is obtained.**



### Tips to assist with History taking:

1. Always **remain neutral**.  
If you have a partiality to a particular diagnosis, it will bias your questions, which may lead to inaccurate answers.
2. Do not ask **leading questions**.
3. You must **understand the reason** for each question you ask. How will the answer contribute to the clinical picture?
4. Many questions on the assessment form will require **follow-up questions**.
5. Ask the patient to **justify his/her answers**. E.g. Why do you think you are improving?
6. Don't hesitate to **come back to a question** that has not been answered to your satisfaction.
7. Remember to **establish baselines** during the history – both symptomatic and mechanical, e.g. pain and stiffness on sit to stand, in am, after bending.
8. **Don't assume** that the patient's current problem is the same as the problems they have experienced in the past or at the start of this episode. Assess presenting symptoms without bias.

### History:

What Key Information is obtained from each section of the assessment form and discuss how this information assists in determining a provisional classification.

#### Section One:

Date \_\_\_\_\_

Name \_\_\_\_\_ Sex M / F \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Date of Birth \_\_\_\_\_ Age \_\_\_\_\_

Referral: GP / Orth / Self / Other \_\_\_\_\_

Work: Mechanical Stresses \_\_\_\_\_

\_\_\_\_\_

Leisure: Mechanical Stresses \_\_\_\_\_

Functional Disability from present episode \_\_\_\_\_

Functional Disability score \_\_\_\_\_

VAS Score (0-10) \_\_\_\_\_

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## Section Two:

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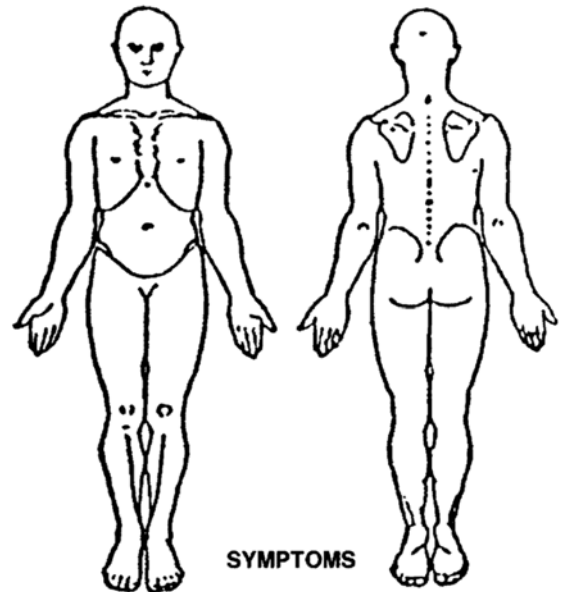
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## Section Three:

Present symptoms \_\_\_\_\_  
 Present since \_\_\_\_\_ *improving / unchanging / worsening*  
 Commenced as a result of \_\_\_\_\_ *or no apparent reason*  
 Symptoms at onset: *back / thigh / leg* \_\_\_\_\_  
 Constant symptoms: *back / thigh / leg* \_\_\_\_\_ Intermittent symptoms: *back / thigh / leg*

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## Section Four

Worse	<i>bending</i>	<i>sitting / rising</i>	<i>standing</i>	<i>walking</i>	<i>lying</i>
	<i>am / as the day progresses / pm</i>			<i>when still / on the move</i>	
	<i>other</i> _____				
Better	<i>bending</i>	<i>sitting</i>	<i>standing</i>	<i>walking</i>	<i>lying</i>
	<i>am / as the day progresses / pm</i>			<i>when still / on the move</i>	
	<i>other</i> _____				





### Section Five:

Disturbed Sleep      Yes / No      Pillows \_\_\_\_\_  
Sleeping postures    *prone / sup / side R / L*      Surface    *firm / soft / sag*

Previous history \_\_\_\_\_

Previous treatments \_\_\_\_\_

### Section Six:

Cough / sneeze / strain / +ve / -ve      Bladder/Bowel: *normal / abnormal*      Gait: *normal / abnormal*

Medications: *Nil / NSAIDS / Analg / Steroids / Anticoag / Other* \_\_\_\_\_

General health: *good / fair / poor* \_\_\_\_\_

Imaging: *yes / no* \_\_\_\_\_

Recent or major surgery: *yes / no* \_\_\_\_\_ Night pain: *yes / no* \_\_\_\_\_

Accidents: *yes / no* \_\_\_\_\_ Unexplained weight loss: *yes / no* \_\_\_\_\_

Other: \_\_\_\_\_

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**At the conclusion of the History consider the following questions:**

1. What classifications can be excluded from the body chart?
2. Is there an indication of a Directional Preference in the W/B?
3. What reassessment baselines do you have?
4. Are there any indications of the presence of serious pathology?
5. Why is the patient seeking help?
6. Are there any barriers to recovery?
7. Are there any factors that implicate the vigour of the physical examination ( more or less)?
8. Do you anticipate being able to reproduce the patient's symptoms with repeated movement testing or will you need to utilise static testing?
9. Do you anticipate being able to reproduce the patient's symptoms in the sagittal plane?
10. What is your provisional classification at the end of the history?



## Barriers to Recovery:

**Yellow / Black / Blue Flags** are commonly used to describe cognitive and behavioural factors which can pose barriers to recovery.

Flags	Problems	Solutions
<b><u>Attitudes / Beliefs</u></b> (Yellow)	Beliefs that: <ul style="list-style-type: none"> <li>▪ All pain is harmful</li> <li>▪ Unable to work with pain</li> <li>▪ Catastrophising</li> <li>▪ Passive attitudes</li> </ul>	Educate <ul style="list-style-type: none"> <li>▪ Pain doesn't mean harm</li> <li>▪ Active treatment</li> <li>▪ Self-management</li> </ul>
<b>Sickness Behaviours</b> (Yellow)	Reduced level of activity <ul style="list-style-type: none"> <li>▪ Avoids movement</li> <li>▪ Limits ADL activity</li> <li>▪ Uses rest to reduce pain</li> <li>▪ Poor pacing strategies</li> </ul>	Educate <ul style="list-style-type: none"> <li>▪ Explain safe pain</li> <li>▪ Graduated activity</li> <li>▪ Movement is good</li> </ul>
<b>Diagnostics (Yellow)</b>	Looking for a Diagnosis <ul style="list-style-type: none"> <li>▪ Sees multiple Doctors</li> <li>▪ Conflicting diagnoses</li> <li>▪ Has multiple treatments</li> <li>▪ Excess imaging</li> <li>▪ Influenced by information from web / family / friends</li> </ul>	Educate <ul style="list-style-type: none"> <li>▪ Don't over investigate</li> <li>▪ Avoid anatomical "labels"</li> <li>▪ Communicate a consistent message</li> </ul>
<b>Emotions (Yellow)</b>	Psychological issues <ul style="list-style-type: none"> <li>▪ Depression</li> <li>▪ Anxiety</li> <li>▪ Fear</li> <li>▪ Stress</li> </ul>	Identify <ul style="list-style-type: none"> <li>▪ Use screening tools</li> <li>▪ Involve a psychologist</li> <li>▪ Advise referring Dr.</li> </ul>
<b>Family (Black)</b>	Family Influences <ul style="list-style-type: none"> <li>▪ Family values / beliefs</li> <li>▪ Over protective</li> <li>▪ Financial pressures</li> </ul>	Educate <ul style="list-style-type: none"> <li>▪ Family and friends</li> <li>▪ Consistent message</li> </ul>
<b>Work (Blue)</b>	Work Influences <ul style="list-style-type: none"> <li>▪ Lack of employer support</li> <li>▪ Dissatisfaction with job</li> <li>▪ Conflict with other workers</li> <li>▪ Limited employment opportunities</li> </ul>	Communication <ul style="list-style-type: none"> <li>▪ Employers</li> <li>▪ Early return to work</li> <li>▪ Positive attitude to work</li> </ul>

## **Physical Examination**

Remember the aims of performing the Physical Examination are to:

- Determine the presence and relevance of acute deformities;
- Determine the symptomatic response to changes in posture;
- Determine baseline measurements;
- Determine the symptomatic and mechanical responses to mechanical loading;
- Establish a Provisional Classification and determine if this fits with the information gained in the History.

### **Physical Examination:**

What key information is obtained from each section of the physical examination portion of the assessment form, and discuss how this information assists in determining a provisional classification.

#### **Section One: Postural Observation**

Sitting: *good / fair / poor*      Standing: *good / fair / poor*      Lordosis: *red / acc / normal*      Lateral shift: *right / left / nil*  
Correction of posture: *better / worse / no effect*      \_\_\_\_\_ Relevant: *yes / no*  
Other observations: \_\_\_\_\_

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#### **Section Two: Neurological**

Motor Deficit      \_\_\_\_\_      Reflexes      \_\_\_\_\_  
Sensory Deficit      \_\_\_\_\_      Dural Signs      \_\_\_\_\_

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### Section Three: Movement Loss

	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Side Gliding R					
Side Gliding L					

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### Section Four: Repeated Movements

#### TEST MOVEMENTS:

**During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising.

**After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

Which words would you expect to see in the repeated movement section if your provisional classification is:

Derangement \_\_\_\_\_  
 Dysfunction \_\_\_\_\_  
 Postural \_\_\_\_\_  
 Other \_\_\_\_\_

Mechanical Response		
↑Rom	↓Rom	No Effect

What mechanical response would you expect to see in the repeated movement section if your provisional classification is:

Derangement \_\_\_\_\_  
 Dysfunction \_\_\_\_\_  
 Postural \_\_\_\_\_  
 Other \_\_\_\_\_



## Section Five: Static Tests

Sitting slouched	_____	Sitting erect	_____
Standing slouched	_____	Standing erect	_____
Lying prone in extension	_____	Long sitting	_____

What symptom response would you expect to see if your provisional classification is:

Derangement \_\_\_\_\_  
Postural \_\_\_\_\_

## Section Six: Other Tests

List the other tests that may be performed to clarify a provisional classification of:

Derangement \_\_\_\_\_  
\_\_\_\_\_

Other \_\_\_\_\_  
\_\_\_\_\_

**At the conclusion of the Physical Examination consider the following questions and explain why:**

1. Did the findings of the Physical Examination support the provisional classification determined by the History?
2. Were you able to produce / change the patient's symptoms as easily as anticipated from the History? If not, why?
3. If your provisional classification today was
  - Derangement
    - was a symptomatic change demonstrated? Yes / No
    - was a mechanical change demonstrated? ROM Inc / Dec
  - Dysfunction
    - was a movement loss present?
    - on repeated movement testing, did you record Prod, NW?
  - Postural
    - was a movement loss present?
    - did you record NE on repeated movement testing?
    - did you reproduce the symptoms with static tests?
4. As a result of your management strategy, what do you anticipate will have changed (function, symptoms, mechanics) at the follow-up?



## **REPEATED MOVEMENT TESTING**

### **Points to Consider When Performing Repeated Movements:**

The information gained during this portion of the examination, assists the clinician to determine a mechanical conclusion and a management principle.

- Establish a clear baseline of symptoms present prior to initiating each change in the direction of test movements, especially when there is a change in the starting position.
- Be certain that the test movements are isolated to one direction only. Establish a starting position and be certain that the patient returns to that starting position (properly) each time.
- For patients who find it difficult to give a clear “better, same or worse’ response a numerical rating of pain 0-10 *might* be helpful in determining changes in symptoms.
- More than one set of test movements may be required. As a general rule, four or five sets of ten is sufficient, if the movements are having no effect on the symptoms, or when the symptoms are produced or increased but no worse as a result. Correlate this with the patient's history.
- Is there any sign of the test movements in one direction altering the ability of the patient to perform movements in the opposite direction, and what effect is there on symptoms?
- The response to test movements may not be obvious. The clinician may then have to determine a treatment principle based upon slight changes in symptoms. The provisional mechanical classification will be confirmed or rejected on subsequent visits, which should be daily if possible (or by a phone call).
- Do not skip parts of the examination unless appropriate. Many of the problems associated with MDT relate to inadequate examination of the patient especially with more chronic patients.
- Testing of flexion is extremely valuable. It can help to confirm a directional preference, reveal an anterior Derangement, confirm the stability of the reduction of a posterior Derangement, educate the patient about the effect of flexion (+ or -) and reduce fear avoidance of flexion for both the patient and the clinician.



**Objective 4: Demonstrate competence in using McKenzie terminology when completing a Lumbar Assessment form.**

**Repeated Movement Terminology**

Your patient presents with the symptoms listed below. Using the correct McKenzie terminology / abbreviations write this out onto the repeated movement section of a Lumbar Assessment form.

**Lumbar Spine:**

Patient presents with: **pain to the right of the lumbar spine extending into the buttock and thigh.**

**FIS:** There is an increase in pain in the right buttock half way through the available range. Increased back pain to the right when straightening

**RFIS:** Pain increases with movement and becomes sharp in the right thigh and spreads down the leg to the calf. The back pain eases. Pain in the leg lessens after the movement stops but does not disappear from the calf completely.

**EIS:** Pain increases in the back and calf

**REIS:** Progressive increase in back and calf pain with each movement. Back and calf pain return to previous level (i.e. pre extension) after movement.

**FIL:** Back and leg pain decrease.

**RFIL:** Back pain feels much better. Return of calf pain after movement.

**EIL:** Back feels very stiff. Pain increases in back and buttock during the movement. No change in leg pain.

**REIL:** Calf and thigh pain goes and stays away but there is a big increase in back pain which remains significant after all movement has stopped.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
Pretest symptoms standing:					
FIS					
Rep FIS					
EIS					
Rep EIS					
Pretest symptoms lying:					
FIL					
Rep FIL					
EIL					
Rep EIL					





**Objective 5: Analyse a completed McKenzie Lumbar Assessment form to determine the correct McKenzie classification.**

**Using the information from the Physical Examination:**

**History:**

**Symptoms:** Right intermittent buttock and calf pain

**Worse:** Bending, sitting, standing, walking

**Better:** Moving, lying

**Physical Examination:**

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion		<b>X</b>			<b>Leg pain</b>
Extension		<b>X</b>			<b>Leg pain</b>
Side Gliding R	<b>X</b>				<b>Buttock Pain</b>
Side Gliding L			<b>X</b>		<b>LSp pain</b>


**TEST MOVEMENTS** Describe effect on present pain – **During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising. **After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
<b>Pretest symptoms standing</b>	<b>Right buttock pain</b>				
FIS	<b>Increases buttock pain,</b>				
Rep FIS	<b>X 10 produces hamstring pain</b>	<b>NW</b>			<b>X</b>
EIS	<b>Increases buttock pain</b>				
Rep EIS	<b>X 10 Decreases buttock, produces LSp pain</b>	<b>NB</b>			<b>X</b>
<b>Pretest symptoms lying:</b>	<b>Right buttock pain</b>				
FIL					
Rep FIL					
EIL	<b>Increases buttock pain</b>				
Rep EIL	<b>X 10 Decreases buttock pain, prod. LSp pain</b>	<b>NB</b>			<b>X</b>
<b>If required pretest symptoms</b>					
EIL with hips L					
Rep EIL Hips L					

**Use this information to Answer questions on the following page**



1. From the symptom location, which of the Mechanical syndromes can be ruled out?
  - A. Postural
  - B. Dysfunction
  - C. Derangement
  - D. OTHER
2. From the Worse/Better responses, is there an indication of a Directional Preference?
  - A. Yes, flexion (sagittal plane)
  - B. No
  - C. Yes, extension (sagittal plane)
  - D. Yes, lateral (frontal plane)
3. How does the information in the Movement Loss section help you?
  - A. Guides you to test repeated side gliding first
  - B. Guides you to carefully monitor symptom response to all movements
  - C. Implies that extension will most likely be the Directional Preference
  - D. Implies that flexion will most likely be the Directional Preference
4. Interpreting the responses to the **loaded** or standing repeated movements, demonstrates:
  - A. No Directional Preference
  - B. Centralisation
  - C. Peripheralisation
  - D. Directional Preference
5. Given the responses to loaded testing and of Decrease NB with EIL, what would be the recommended way to continue with the assessment?
  - A. Test sustained extension in lying
  - B. Test repeated side glide movements in standing
  - C. Test RFIL
  - D. Exhaust the sagittal plane prior to exploring lateral
6. Which clinical response would guide the clinician to explore EIL with Hips off Centre (HOC)?
  - A. Asymmetrical Side Glide Movements
  - B. Decrease No Better with EIL
  - C. No Better as a result of more REIL, EIL O/P and Extension mobilisation
  - D. No Better as a result of REIS and REIL



## MODULE THREE:

### MANAGEMENT OF THE MDT SYNDROMES

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Compare and contrast the management principles for the 3 syndromes.
2. Analyse the role of force progressions and force alternatives and their implementation in the management of patients with MDT.
3. Identify the components of the Re-assessment process, analyse and interpret the findings to confirm classification and guide further management
4. Summarise the components of Recovery of Function and Prophylaxis and discuss the implementation of these in management.



**Objective 1: Compare and contrast the management principles for the 3 Syndromes.**

**COMPARE AND CONTRAST THE MANAGEMENT PRINCIPLES OF THE 3 SYNDROMES**

	<b>Derangement</b>	<b>Dysfunction</b>	<b>Postural</b>
<b>Aim of management</b>			
<b>Effect of mechanical component of treatment</b>			
<b>Progression of forces used? Or Clinician procedures used?</b>			
<b>Effect of educational component of treatment</b>			
<b>Give examples of models used for patient education</b>			
<b>Barriers to recovery</b>			
<b>Response time (Rapid, Slow)</b>			



**Objective 2: Analyse the role of force progressions and force alternatives and their implementation in the management of patients with MDT.**

## **PROGRESSION OF FORCES**

The application of the progression of forces is a logical sequence based on the symptomatic and mechanical responses. Continual questioning as to the patient's response to the procedures will determine the need/direction/level/magnitude of the forces required. The application of clinician procedures is intended to enable the patient to then self-treat more effectively. The progression of forces is summarised as follows.

**1. Self-Treatment Procedures:**

Utilisation of the patient's own positions and movements must be thoroughly explored first. The patient's response to these procedures clarifies the mechanical diagnosis and identifies the need for, and magnitude of, additional forces that may be required. When self-treatment procedures are properly implemented, the majority of patients do not require clinician procedures. Self-treatment procedures are performed first. There are only a few exceptions, such as manual correction of a lateral shift.

**2. Patient Overpressure:**

This assists in the patient moving to their end range. Overpressure will expose Dysfunction or reduce Derangement.

**3. Clinician Overpressure:**

This is required when the patient self-generated forces are not sufficient to abolish their symptoms. It will also further clarify the mechanical disorder. It is only utilised until the patient can self-treat effectively.

**4. Clinician Mobilisation:**

The symptomatic and mechanical response determined prior to applying clinician mobilisation will have already demonstrated that forces in this direction are safe and the correct principle of treatment has been chosen. The procedures are applied whilst continuously assessing the patient's response to determine the best level, position, direction and magnitude of the procedure. The procedures used are general and non-specific as to the segmental level, but the intended mechanical effect is very specific. The intent of applying mobilisation is to add more force. The patient's ability to perform self-treatment procedures is assessed following the clinician procedures.

**5. Clinician Manipulation:**

These procedures are required in a very small percentage of patients, but represent the last progression in the application of increasing mechanical forces. By the time these procedures are considered, the patient has been subjected to a significant amount of repeated mechanical forces in the direction of the treatment principle. The patient has responded favourably so far, but the response has been incomplete. The intent of these high velocity, low amplitude procedures is to apply even more mechanical force to enable the patient to self-treat effectively.

### **Force Alternatives:**

Force alternatives should be considered when?

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Discuss possible force alternatives.

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## **TREATMENT PROGRESSIONS / ALTERNATIVES**

List the next two progressions of force and give force alternatives where appropriate for each of the following procedures:

### **Lumbar Spine**

Extension in Lying

1. \_\_\_\_\_
2. \_\_\_\_\_

*Force alternatives*

1. \_\_\_\_\_
2. \_\_\_\_\_

Prone Lying

1. \_\_\_\_\_
2. \_\_\_\_\_

Extension in lying with hips off centre with clinician O/P

1. \_\_\_\_\_
2. \_\_\_\_\_

Rotation in flexion

1. \_\_\_\_\_
2. \_\_\_\_\_

Flexion in lying

1. \_\_\_\_\_
2. \_\_\_\_\_

*Force alternatives*

1. \_\_\_\_\_
2. \_\_\_\_\_

Side Gliding in standing

1. \_\_\_\_\_
2. \_\_\_\_\_



**Objective 3: Identify the components of the Re-assessment process, analyse and interpret the findings to confirm classification and guide further management**



**THE McKENZIE INSTITUTE RE-ASSESSMENT FORM**

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

**Check of Management Strategies:**

Posture Correction: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

**Symptomatic Presentation:**

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

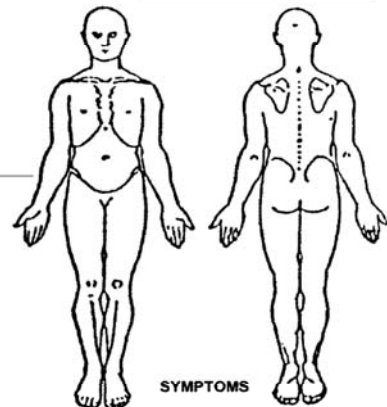
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



**Mechanical Presentation:**

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

**SUMMARY:** Better / Same / Worse Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement Dysfunction Posture OTHER (subgroup) \_\_\_\_\_

**Management Today:**

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_ Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_ Night Roll \_\_\_\_\_

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## **RE-ASSESSMENT**

The patient is ideally followed up and re-assessed within 24 - 48 hours. If it is not possible to follow in this time-frame, a phone call may be arranged to ensure that the patient is responding as expected.

### **At re-assessment consider the following questions?**

1. What is the most significant change from your assessment on Day One?
2. Are you able to confirm your provisional classification?
3. Do you think the patient has been following your instructions?

Does the management need to be altered?

The possibilities on how the patient may present on day two are as follows:

**As a direct result of self-management instructions the patient is**

**BETTER:**



The diagnosis is confirmed

Check exercise performance and the effect on baselines.  
Ensure exercises performed at the available end range

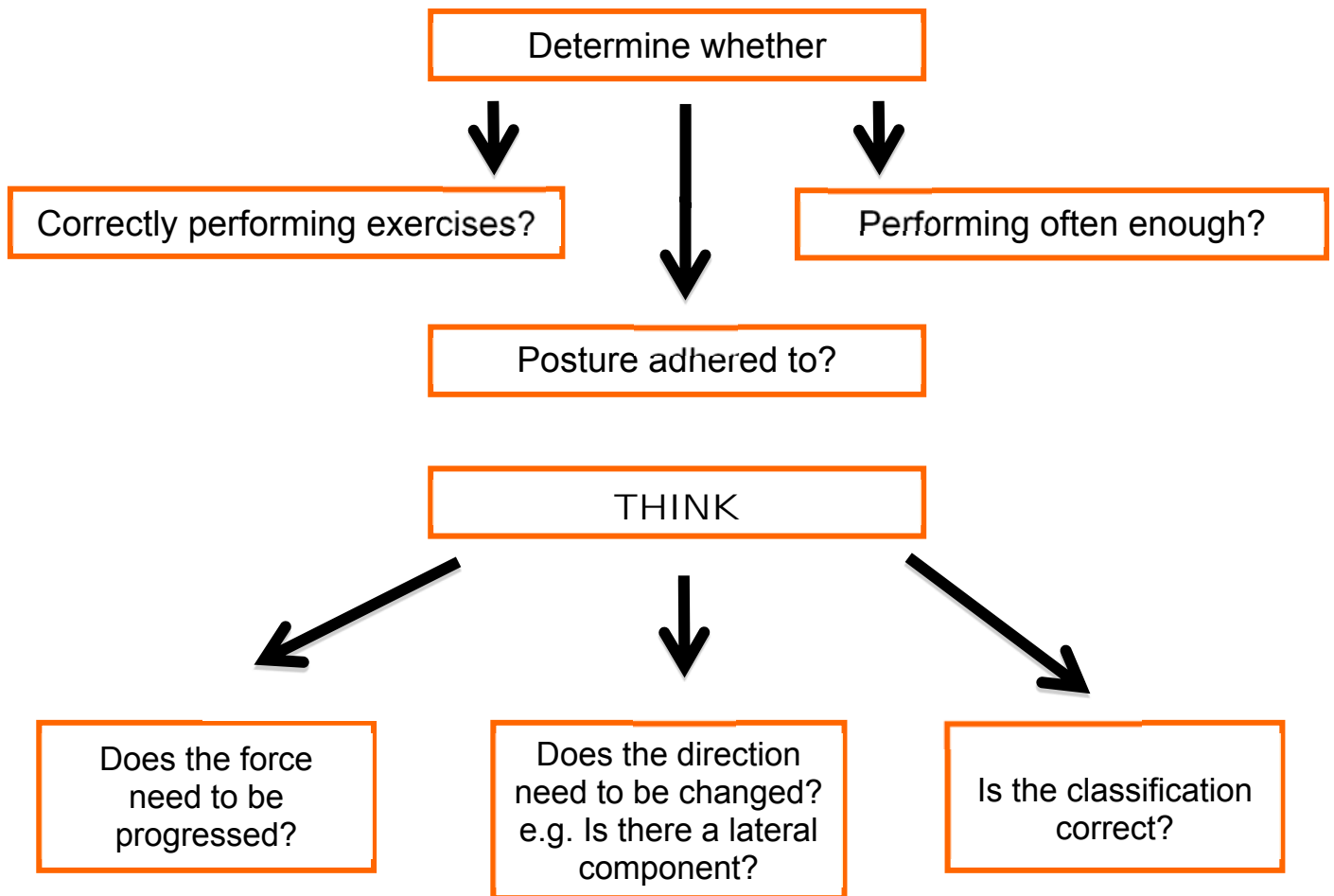
Check and tidy up posture

Review the patient's understanding and commitment

Send patient home with same self-management

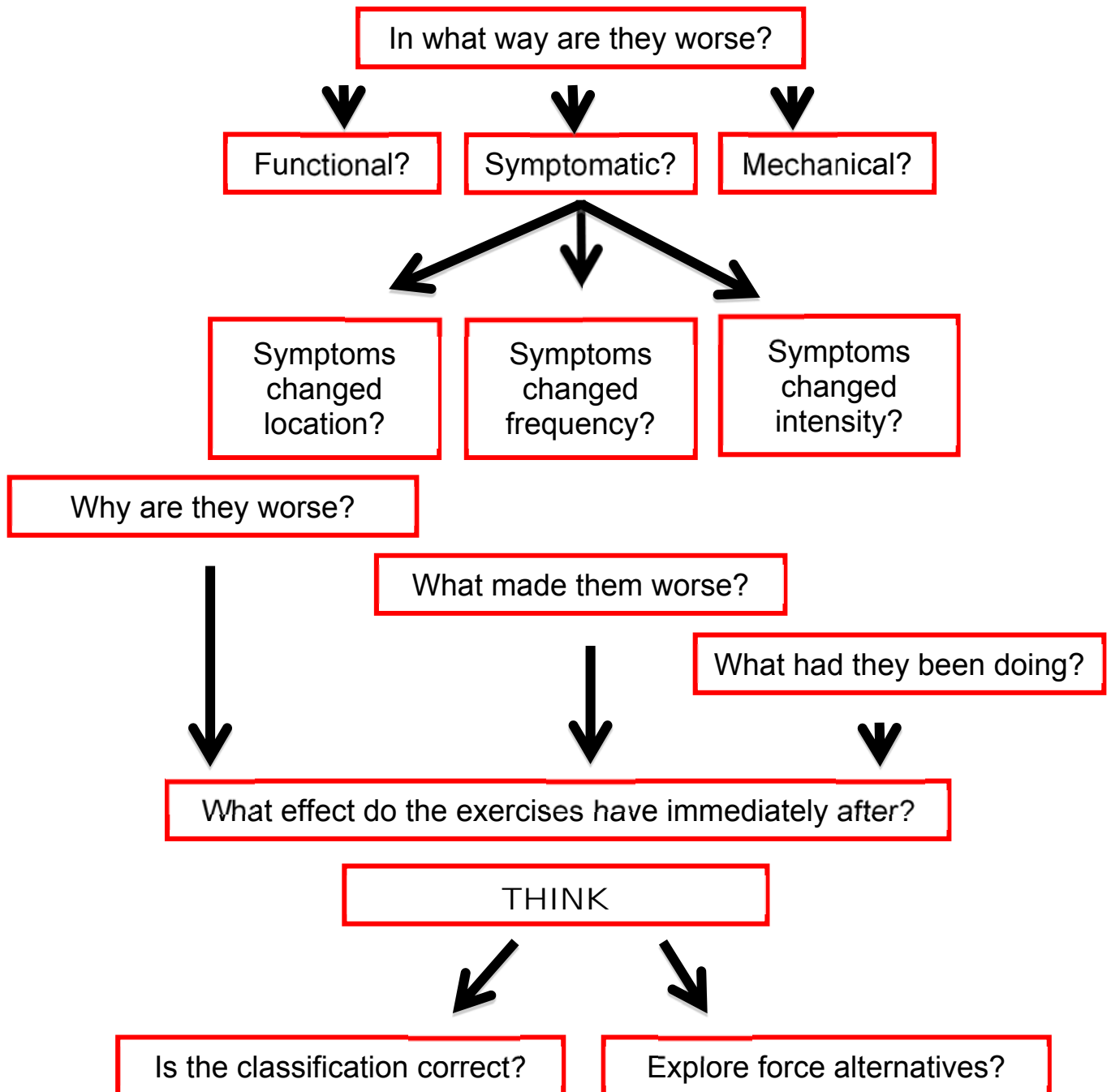
**As a direct result of self-management instructions the patient is:**

**NO BETTER:**



**As a direct result of self-management instructions the patient is**

**WORSE:**



## THE TRAFFIC LIGHT GUIDE

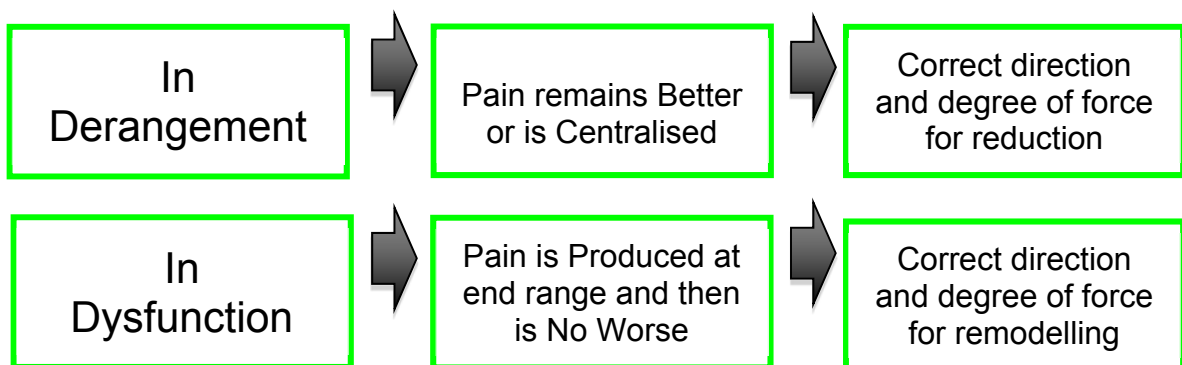


The "Traffic Light Guide" can be used to help you interpret the 'after words' in the mechanical evaluation.

This guide gives a clear picture to assist in the next step of your clinical reasoning process. The colour of the traffic light will indicate whether you should proceed as you have been doing OR you need to progress the force OR you need to STOP and consider force alternatives.

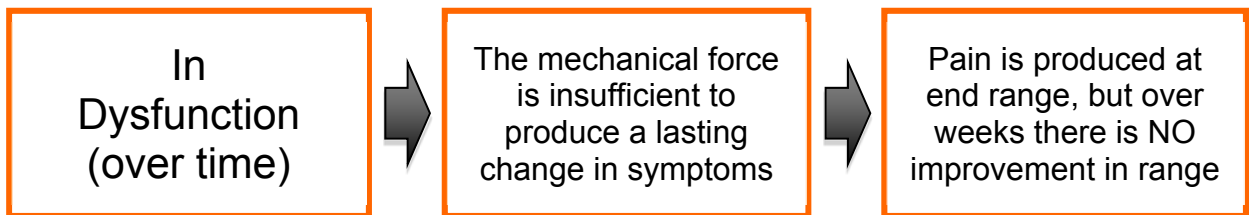
Provided a symptomatic baseline is established, it is possible for repeated movements or sustained positioning in any given direction to produce one of three responses.

### **Green Light**



This suggests that all is well, continue with more of the same until condition is resolved or 'traffic light' changes

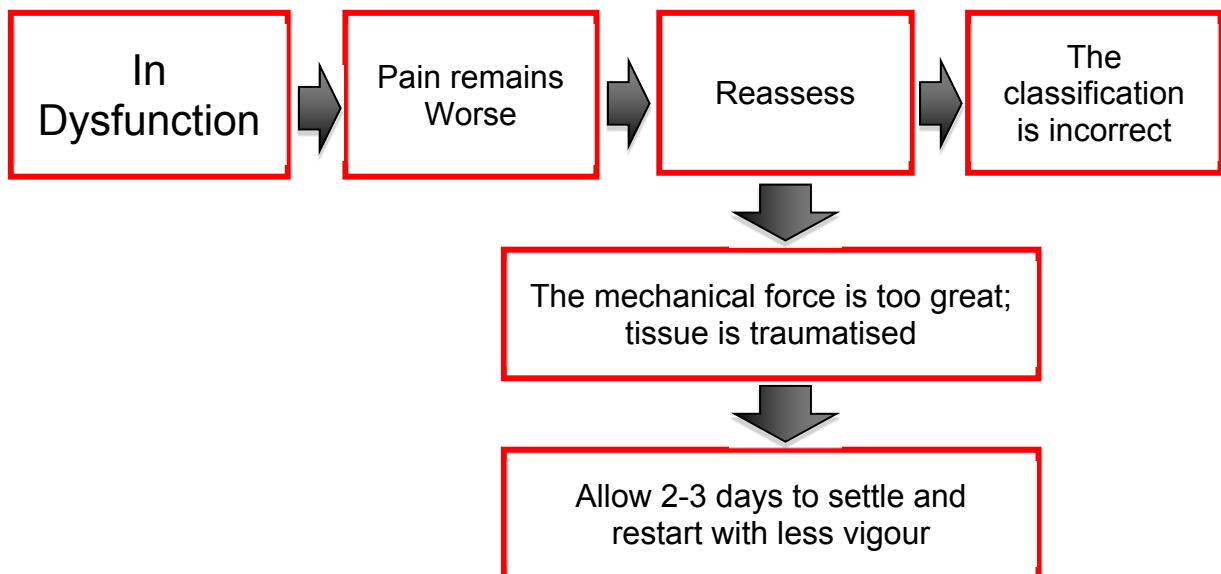
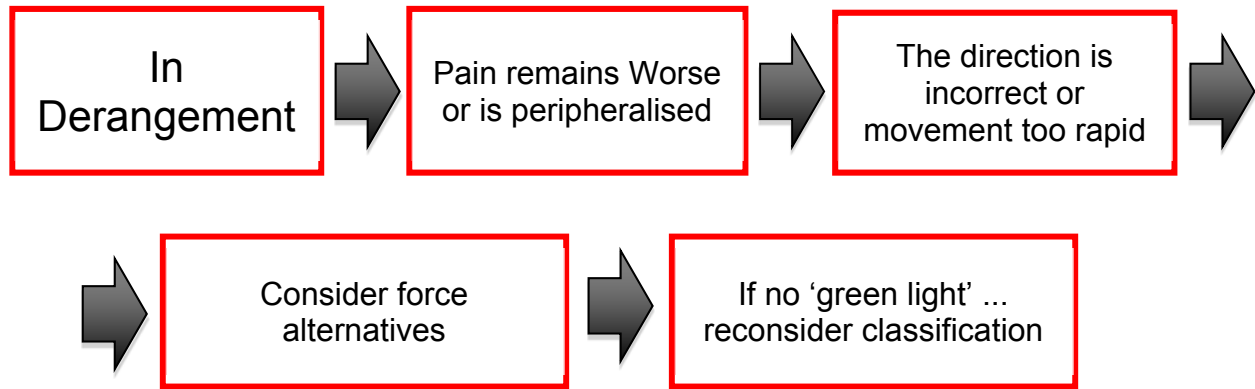
## ☹️ Amber Light ☹️



**This suggests that the careful application of more force is warranted**

**Only when there is an Amber Light are we justified in applying more forceful mechanical forces to the tissues in question.**

## ☹️ Red Light ☹️



### Notes:

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**Objective 4: Summarise the components of Recovery of Function and Prophylaxis and discuss the implementation of these in management.**

## **RECOVERY OF FUNCTION**

1. What are we aiming to achieve with recovery of function?

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2. What mechanical components may need to be addressed to achieve the goal of recovery of function?

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3. What instructions should be given when recovery of function is commenced following a Derangement?

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## **PROPHYLAXIS**

1. Discuss the key goals of prophylaxis following an episode of low back pain.

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2. How can these goals be best achieved? Compare and contrast the role of the patient and your role?

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3. Analyse how a prophylactic programme would differ when provided for the McKenzie syndromes.

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## MODULE FOUR:

### LUMBAR SPINE PROCEDURES

#### **OBJECTIVES**

**With sufficient time to/for practice, participants will be able to meet/achieve the following objectives to:**

1. Effectively instruct the self-treatment procedures for the lumbar spine, identify difficulties in performance and problem solve as required.
2. Effectively perform the clinician procedures for the lumbar spine, analyse and correct errors with performance.
3. Understand the indications for the application of each procedure, interpret the response and discuss implications.



## **GUIDELINES FOR THE APPLICATION OF CLINICIAN PROCEDURES**

**MOST COMMON MISTAKES IN THE APPLICATION OF CLINICIAN PROCEDURES CAN BE CORRECTED BY ADDRESSING ONE OR MORE OF THE FOLLOWING AREAS OF ANALYSIS.**

**1. RELAX (patient and clinician):**

The patient has to be relaxed for the spinal segments to be moved through the full range of motion, and the clinician has to be relaxed in order to achieve this. Clinician procedures cannot be performed effectively if neither is relaxed.

**2. POSITION PROPERLY (patient and clinician):**

Both the patient and the clinician have to be in the correct position in order that the spinal segments can be moved properly and the clinician is able to achieve this with the least amount of effort. The position of the patient on the table, the height of the table, and positioning of the clinician will all assist to maximise the effect of the use of force.

**3. USE PROPER CONTACT:**

The clinician must learn to work through the tissue (skin) tension to establish the correct contact with the spinal segments that are to be mobilised. The correct body contact will vary with the different procedures. Typically the pisiform is used for prone techniques of the lumbar spine. In long lever techniques proper contact is important to establish the correct line of drive.

**4. DETERMINE LINE OF DRIVE:**

The line of drive is the direction in which the force is imparted to the patient's spine. Generally, for extension procedures throughout the spine this force will be perpendicular to the spinal segments where the procedure is being performed. The position of the patient and clinician determine the line of drive of the force to be applied.

**5. APPLY TECHNIQUE:**

Once proper contact has been established, the force is applied along the indicated line of drive to mobilise the relevant area of the spine. The soft tissue slack is taken up then the force is applied.

**6. ASSESS PATIENT'S RESPONSE:**

When applying clinician procedures within the context of Mechanical Diagnosis and Therapy, the appropriateness of your choice of procedure (level, direction, side, etc.) is determined by the effect of the procedure on the symptoms, movement loss, self-treatment ability and other changes in clinical signs (dural tension, neurological, functional testing, etc.).

**7. VARY BASIC TECHNIQUE:**

Where appropriate, useful and commonly used variations or modifications of the basic procedures are described.

## **WORKSHOP RULES FOR PRACTICAL SESSIONS**

1. Work in groups of three: one person is the patient, one the clinician and one the observer. Each person should play each role for each procedure. Each person has an obligation towards constructive criticism and honest communication. Change your group of three, each half day, as it is important to practise on different body types.

If for any reason you are unable / unwilling to be a patient, please indicate this to the Instructor.

- **PATIENT:** it is your role to give feedback to the clinician about how you are responding to the application of the clinician procedure. You should make comments about positioning, comfort and appropriateness of contact, appropriateness of the line of drive and the amount of force applied. It is very important that you speak up and be honest if something does not feel right.
  - **OBSERVER:** it is your role to provide feedback and assist in the set-up of the procedure, particularly positioning and line of drive. You should also provide feedback and assistance regarding the assessment of patient response, as well as general feedback about the application of the procedure itself.
  - **CLINICIAN:** it is your role to follow the rules and guidelines for the application of clinician procedures and progress the forces only if the patient's response indicates this to be appropriate. If you are not very experienced in using clinician procedures, the set-up of the procedure and the mobilisation procedure must be practised. It is your responsibility to be open to the advice given and, most importantly, to the feedback of the 'patient' you are practising on.
2. When you are the clinician, apply the procedure as you would apply it to a patient in your clinic. You must assess for contra-indications for each procedure to be practiced. You should receive consent from your 'patient' before applying progressions of force. If your 'patient' does not approve to the application or the progression of force, do not proceed.
  3. The appropriate use of terminology as defined within the system of Mechanical Diagnosis and Therapy is expected throughout the workshop.
  4. Always attempt to use the least amount of force required to achieve the desired clinical response.
  5. If in doubt, stop and re-evaluate or request assistance.



## **TABLE OF LUMBAR PROCEDURES** *(not all in order of force progression)*

- **Extension principle – static**
  1. Lying prone
  2. Lying prone in extension
  3. Sustained extension
  4. Posture correction
- **Extension principle – dynamic**
  5. Extension in lying (with patient overpressure) – EIL
  - 6a. Extension in lying with clinician overpressure
  - 6b. Extension in lying with belt fixation
  7. Extension mobilisation (in neutral or in extension)
  8. Extension manipulation
  9. Extension in standing – EIS
  10. Slouch-overcorrect
- **Extension principle with lateral component – dynamic**
  11. Extension in lying with hips off centre
  12. Extension in lying with hips off centre with clinician O/P  
(a: sagittal; b: lateral)
  13. Extension mobilisation with hips off centre
  14. Rotation mobilisation in extension
  15. Rotation manipulation in extension
- **Lateral principle**
  16. Self-correction of lateral shift or side gliding
  17. Manual correction of lateral shift
- **Flexion principle**
  18. Flexion in lying – FIL
  19. Flexion in sitting
  20. Flexion in standing – FIS
  21. Flexion in lying with clinician overpressure
- **Flexion principle with lateral component**
  22. Flexion in step standing – FISS
  23. Rotation in flexion
  24. Rotation mobilisation in flexion
  25. Rotation manipulation in flexion



## Procedures 1 to 4: Described in the Part A manual

### EXTENSION PRINCIPLE - Dynamic

This principle of treatment is utilised in the treatment of posterior Derangements and extension Dysfunctions.

#### 5. Extension in lying (with patient overpressure) – EIL



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#### Problem Solving:

- Change the technique to ensure it is passive.
- Is the patient going far enough?
- Is the reduction being attempted too quickly?
- Is there a relevant lateral shift?
- Is the mechanical diagnosis correct?

#### 6a. Extension in lying with clinician overpressure



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**Problem Solving:**

- Begin with a little pressure and add more according to the patient's response.
- Move with the patient while maintaining the pressure.
- Change the position of your hands, the level and/or the angle.
- Is there a relevant lateral shift?
- Is the mechanical diagnosis correct?

**6b. Extension in lying with belt fixation**



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**Problem Solving:**

- Adjust the strap to a different level.
- Is the reduction being attempted too quickly?
- Is there a relevant lateral shift?
- Is the mechanical diagnosis correct?

## 7. Extension Mobilisation (in neutral or in extension)



### Problem Solving:

- Change the level of the technique.
- Change the position of the patient to increase elevation of their upper body.
- Is there a relevant lateral shift?
- Is the mechanical diagnosis correct?

## 8. Extension Manipulation: Taught on the Diploma MDT Programme

## 9. Extension in Standing – EIS: Described in the Part A manual

## 10. Slouch – Overcorrect: Described in the Part A manual

## EXTENSION PRINCIPLE WITH LATERAL COMPONENT

Indicated for the postero-lateral Derangements, which are not responding to the extension procedures in the sagittal plane.

### 11. Extension in lying with hips off centre



#### Problem Solving:

- Is EIL being performed passively?
- Is the patient going far enough?
- Is the reduction being attempted too quickly?
- Is the patient maintaining the hips off centre during the procedure?
- Is more force required?
- Change the position of the hips to increase the “closing down” effect or (rarely) to “open up” on the side of pain.
- Is correction in standing required first?
- Is the mechanical diagnosis correct?



## 12. Extension in lying with hips off centre with clinician O/P

### a: sagittal



### b: lateral



#### Problem Solving

- Is the patient maintaining the hips off centre during the procedure?
- Is more force required?
- Change the position of the hips to increase the “closing down” effect or (rarely) to “open up” on the side of pain.
- Is correction in standing required first?
- Is the mechanical diagnosis correct?

### 13. Extension Mobilisation with hips off centre



#### Problem Solving:

- Is the patient maintaining the hips off centre during the procedure?
- Is more force required?
- Is correction in standing required first?
- Is it time to change to the sagittal plane?

### 14. Rotation Mobilisation in Extension (hands on right side)



**Problem Solving:**

- Is more force required?
- Is the force being applied on the correct side?
- Is it time to change to the sagittal plane?

**15. Rotation Manipulation in Extension: Taught on Diploma MDT Programme**



## LATERAL PRINCIPLE

Indicated for Derangements that have a primary lateral component – either those presenting with a lateral shift deformity or those whose symptoms are worsened or do not respond with sagittal procedures

### 16. Self-Correction of a Lateral Shift:

#### a. Free standing



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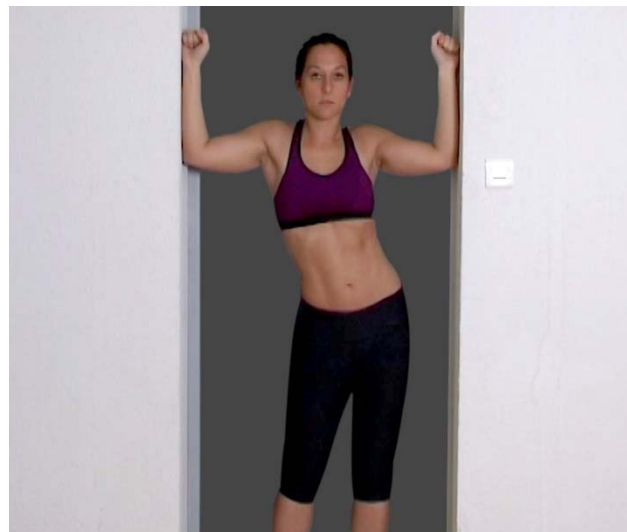
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**b. Against the wall:**



**c. In a door frame:**



**Problem Solving:**

- Should be a side glide, not side bend; are patient's shoulders parallel to floor?
- Is reduction being attempted too quickly?
- Is the patient going far enough into side glide?
- Change the angle of flexion/extension.
- Is the mechanical diagnosis correct?
- Change directions.
- Instruct carefully on how to perform the technique

**17. Correction of a Right Lateral:**  
(demonstrated below)



**Problem Solving:**

- Should be a side glide, not side bend; are patient's shoulders parallel to floor?
- Is reduction being attempted too quickly?
- Are you taking the procedure far enough?
- Are you abandoning the procedure too quickly?
- Change the angle of flexion/extension.
- Is the mechanical diagnosis correct?
- Change direction?

## FLEXION PRINCIPLE

Flexion procedures will be utilised in the recovery of function (posterior Derangement), flexion Dysfunction including Adherent Nerve Root, and with the anterior Derangement Syndrome. Self-treatment procedures are usually effective therefore clinician procedures are rarely required.

### 18. Flexion in Lying: FIL



#### Problem Solving:

- Where are the symptoms prior to starting?
- Is the patient returning to neutral?
- Is the starting position appropriate?
- Is the patient going far enough?
- Are their knees too far apart?
- Pain during movement, or worse as a result?
- Creates obstruction to curve reversal?
- Is the mechanical diagnosis correct?

## 19. Flexion in Sitting:



### Problem Solving:

- Adjust the position of the buttocks.
- Adjust the seat height.
- Add more pressure by pulling through on ankles.

## 20. Flexion in Standing: FIS





**Problem Solving:**

- Where are the symptoms prior to starting?
- Is the patient returning to neutral?
- Is the starting position appropriate?
- Is the patient going far enough?
- Pain during movement, or worse as a result?
- Creates obstruction to curve reversal?
- Is the mechanical diagnosis correct?

**21. Flexion in Lying with clinician overpressure**



**Problem Solving:**

- Where are the symptoms prior to starting?
- Is the patient returning to neutral?
- Is the starting position appropriate?
- Are you getting to end range?
- Pain during movement, or worse as a result?
- Creates obstruction to curve reversal?
- Is the mechanical diagnosis correct?

## FLEXION PRINCIPLE WITH LATERAL COMPONENT

Indicated for antero-lateral Derangements, which are not responding to flexion procedures in the sagittal. Rotation in flexion and rotation mobilisation in flexion can be used for postero-lateral Derangements that have been unchanged or worsened by extension principle procedures and that respond to lateral principle procedures. This is a lateral manoeuvre with considerable adjunct flexion.

### 22. Flexion in Step Standing (right foot on chair)



#### Problem Solving:

- Adjust the height of the stool.
- Increase pressure by pulling through an ankle.
- Ensure the movement is to end range.

**23. Rotation in Flexion (knees to the right)**



**24. Rotation Mobilisation in Flexion (Sustained) (knees to the right)**



**Problem Solving:**

- Change the angle of flexion and rotation.
- Are you taking the procedure far enough?
- Is reduction being attempted too quickly?
- Change directions.
- Is the mechanical diagnosis correct?

**25. Rotation Manipulation in Flexion: Taught on Diploma MDT Programme**

## MODULE FIVE:

### DIFFERENTIAL DIAGNOSIS AND SUBGROUPS OF OTHER

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Discuss the criteria of the subgroups of OTHER.
2. Analyse the findings of the MDT assessment to differentiate MDT syndromes from subgroups of OTHER.
3. Perform the pain provocation tests for the sacro-iliac joint, interpret the results, discuss classification and management
4. Discuss the management of each subgroup of OTHER integrating MDT principles.



**Objective 1: Discuss the criteria of the subgroups of OTHER.**

**McKenzie Classification – Spinal OTHER**

Serious pathology (list is not exhaustive)		
Category	Clinical findings (Red Flags)	Clinical Examples
Cancer	Age >55, <b>history of cancer</b> , unexplained weight loss, progressive, not relieved by rest	May be primary site or metastases
Cauda equina syndrome /cord compression	Bladder / bowel dysfunction, saddle anaesthesia, global or motor weakness in legs. Clumsiness in legs	
Spinal fracture	History of severe trauma, older age, prolonged steroid use OR young, active with sport related back pain	Compression fracture, stress fracture of the pars
Spinal related infection	Fever, malaise, constant pain, all movements worsen	Epidural abscess, discitis, transverse myelitis
Vascular	Vascular disease, smoking history, family history, age over 65, male>female History of trauma, dizziness, diplopia, dysarthria and multiple other non-mechanical symptoms	Abdominal aortic aneurism, cervical artery dysfunction

Subgroup	Definition	Criteria (common)	Clinical examples
<b>Chronic Pain Syndrome</b>	Pain-generating mechanism influenced by psychosocial factors or neurophysiological changes	Persistent widespread pain, aggravation with all activity, disproportionate pain response to mechanical stimuli, inappropriate beliefs and attitudes about pain.	
<b>Inflammatory</b>	Inflammatory arthropathy	Constant pain, morning stiffness, excessive movements exacerbate symptoms	RA, sero-negative arthritis, ankylosing Spondylitis
<b>Mechanically Inconclusive</b>	Unknown musculoskeletal pathology	Derangement, Dysfunction, Postural and subgroups of OTHER excluded. Symptoms affected by positions or movements BUT no recognisable pattern identified OR inconsistent symptomatic and mechanical responses on loading	
<b>Mechanically Unresponsive Radiculopathy</b>	Radicular presentation consistent with a currently unresponsive nerve root compromise	Symptoms presenting in a radicular pattern in the upper or lower extremity. Accompanied by varying degrees of neurological signs and symptoms. There is no centralisation and symptoms do not remain better as a result of any repeated movements, positions or loading strategies	
<b>Post-Surgery</b>	Presentation relates to recent surgery	Recent surgery and still in post-operative protocol period	
<b>Sacro-iliac (SIJ)/Pregnancy-Related Pelvic Girdle Pain (PGP)</b>	Pain-generating mechanism emanating from the SIJ or symphysis pubis	Three or more positive SIJ pain provocation tests having excluded the lumbar spine and hip	If related to pregnancy: PGP
<b>Spinal Stenosis</b>	Symptomatic degenerative restriction of spinal canal or foramina	Lumbar Spine: older population, history of leg symptoms relieved with flexion activities and exacerbated with extension, longstanding loss of extension. Cervical Spine: arm symptoms consistently produced with closing foramen, abolished or decreased with opening	Lumbar stenosis, cervical lateral foraminal stenosis
<b>Structurally Compromised</b>	Soft tissue and/or bony changes compromising joint integrity	Mechanical symptoms (ROM restricted, clunking, locking, catching). May have sensation of instability Long history of symptoms or history of trauma. Irreversible with conservative care.	Painful structural scoliosis, painful osteoporosis, grade 3-4 spondylolisthesis, upper cervical structural instability – RA
<b>Trauma/ Recovering Trauma</b>	Recent trauma associated with onset of symptoms	Recent trauma associated with onset of constant symptoms / recent trauma associated with onset of symptoms, now improving and pain intermittent	Post whiplash



**Objective 2: Analyse the findings of the MDT assessment to differentiate MDT Syndromes from subgroups of OTHER.**

History /Exam	Derangement	MUR	Stenosis
<b>Pain location</b> (Local, referred or radicular)			
<b>Present for</b> (Acute, Subacute, Chronic)			
<b>Constant or intermittent</b>			
<b>Worse</b> (History: be general)			
<b>Better</b> (History: be general)			
<b>Posture</b>			
<b>Relevant Deformity</b>			
<b>Neurological Exam</b>			
<b>Movement loss:</b>			
<b>Repeated Movements</b>			
<b>RFIS</b>			
<b>REIS</b>			
<b>RSGIS</b>			
<b>RFIL</b>			
<b>REIL</b>			
<b>Other tests</b>			



## DIFFERENTIATION OF ASYMMETRICAL UNILATERAL SYMPTOMS BELOW THE KNEE

1. To differentiate between a Derangement and ANR which testing procedures would you use?

2. What are the expected responses for each case in the above?

**Derangement:**

**ANR:**

3. What guidelines should you consider when designing a remodelling regime for the ANR?



**Objective 3: Perform the pain provocation tests for the sacro-iliac joint, interpret the results, discuss classification and management**

## Sacro-iliac Joint:

### Pain provocation tests, classification and management

Numerous clinical tests have been devised over the decades to assess for the presence of SIJ pain. In general, these can be divided into three types; kinetic tests, positional/palpation tests and pain provocation tests. Research on kinetic and positional/palpation testing have shown consistent findings; insufficient reliability and poor validity. Even clusters of these tests have been found to be inadequate for clinical use. Additionally, the relationship between motion or positional abnormalities and pain is not supported. One reason for the limited clinical utility of these tests may be due to the fact that the motion of the SIJ is limited to only minute amounts of rotation or translation.

Fortunately, certain clusters of SIJ pain provocation tests have been shown to have acceptable reliability and validity. High values of sensitivity and specificity have been demonstrated, especially once the lumbar spine has been ruled out as a source of symptoms with an MDT assessment.

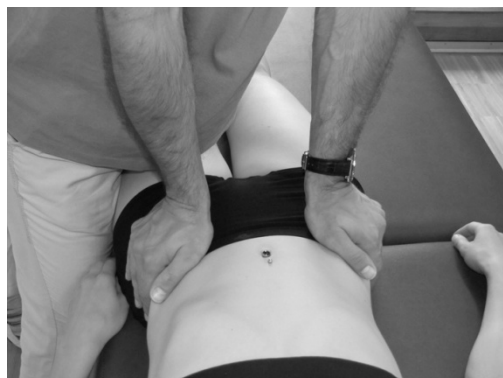
The McKenzie classification system with a cluster of SIJ provocation tests showed excellent sensitivity and specificity values for the diagnosis of SIJ related pain

*Laslett M. (2008) Evidence-Based Diagnosis and Treatment of the Painful Sacroiliac Joint. J Man Manip Ther 16:3:142-152*

The reliability, specificity and sensitivity of a cluster of 5 pain provocation tests have been studied in detail, these tests are listed below. It was concluded that these tests may be used to detect a sacroiliac source of low back pain, **once a McKenzie evaluation has ruled out the lumbar spine**. The presence of two positive responses to the first four tests or three positive out of the six listed (Pelvic Torsion (Gaenslen's) test is applied to both sides), strongly predict sacroiliac pathology. When all six tests are negative, the SIJ can be ruled out as a source of pain.

### DISTRACTION OR 'GAPPING' (lying supine)

The therapist applies pressure to both anterior superior iliac spines (ASIS's). The force is directed posteriorly and laterally.





## POSTERIOR SHEAR OR 'THIGH THRUST' (lying supine)

The therapist applies a posterior shearing stress to the sacroiliac joint through the femur whilst the sacrum is stabilised. Excessive adduction of the hip is to be avoided as flexion/adduction of the hip normally is uncomfortable or painful.



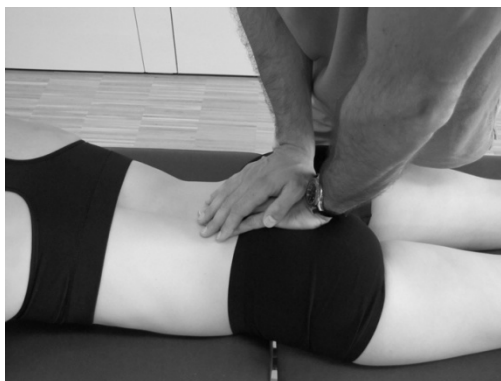
## COMPRESSION (side lying)

The therapist applies pressure to the uppermost iliac crest. The force is directed towards the opposite iliac crest.



## SACRAL THRUST (lying prone)

The therapist applies pressure directly to the sacrum whilst the ilia are fixed on the treatment table. This causes an anterior force of sacrum on the ilia.

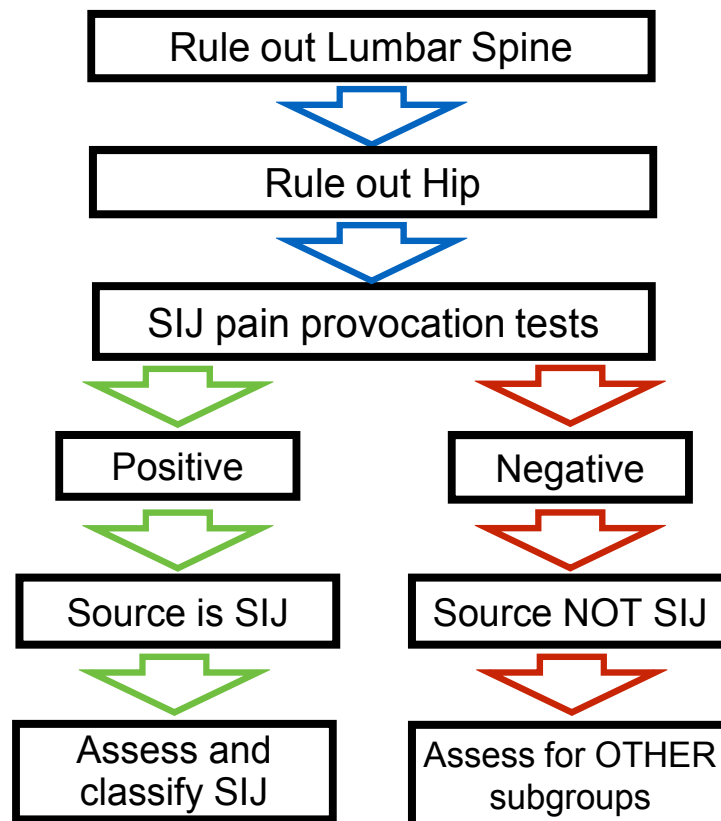


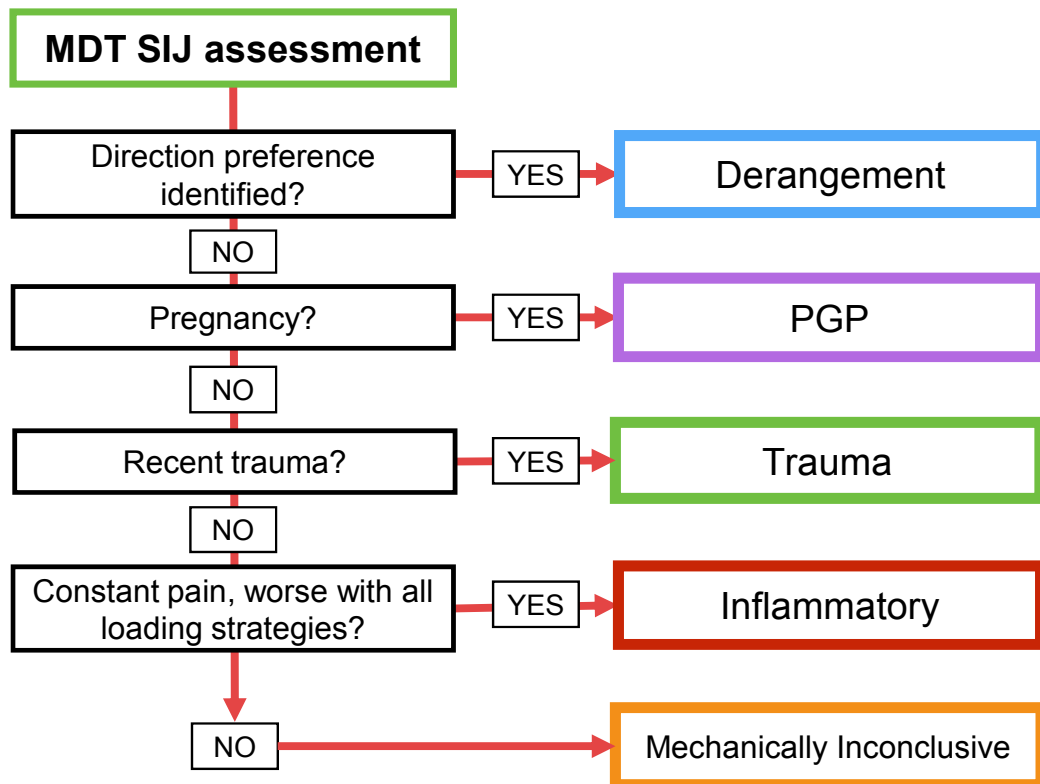
## PELVIC TORSION (lying supine – applied to both sides)

Posterior rotation of the left ilium on the sacrum is obtained by flexion of left hip and knee whilst simultaneously the right hip is extended. Overpressure is applied to force the sacroiliac joint to end range. Then anterior rotation of the right ilium on sacrum is performed by forcing the right thigh towards the floor. The test is then performed on the opposite leg. Sometimes a Directional Preference can be demonstrated with this test. The test is also called the Gaenslen's test.



## SIJ: Differential Diagnosis Algorithm





## Derangement:

Use these movements to assess for Directional Preference and for self-treatment



Posterior Rotation SIJ



Anterior rotation SIJ

**Objective 4: Discuss the management of each subgroup of OTHER integrating MDT principles.**

<b>Spinal OTHER Subgroups</b>	<b>Management; integrating MDT principles and the evidence</b>
<b>Serious Pathology</b>	Refer to / communicate directly with medical provider or emergency department depending on the nature of the problem.
<b>Chronic Pain Syndrome</b>	Education about the nature of chronic pain and graded exposure / CBT using the produce/increase NW principle. Encourage self-treatment, and perform active assessment (repeated movements) to help address any fear avoidance. Additionally, utilise any evidence based active interventions aimed at modulating central processing including multi-disciplinary management.
<b>Inflammatory</b>	Refer to appropriate medical provider for medical management if source unknown. If source known, then education and guidance regarding the evidence based self-management of the particular systemic disease is warranted.
<b>Mechanically Inconclusive</b>	Using information of aggravating factors from MDT history, create the ideal environment for recovery by avoiding aggravating movements/positions. Address functional deficits and physical impairments using concepts of self-management, produce/Increase NW, symptom interpretation and education. If unresponsive, refer to appropriate medical provider.
<b>Mechanically Unresponsive Radiculopathy</b>	Education about the trend for a positive natural history. Encourage graduated increase of activity and function guided by Produce/Increase NW principle. Address any fear avoidance, support regaining of ROM while monitoring neurological deficits. Discuss options of injection or other pain interventions or refer to medical provider for imaging or surgery.
<b>Post Surgery</b>	Follow post surgical protocols; if recovery as per expected timeline, continue rehab as normal focusing on independence, education, progression of forces and produce/increase NW principle. If recovery is poorer than expected, then reassess classification and treat as assessment dictates.
<b>Sacro-iliac (SIJ)/Pregnancy-Related Pelvic Girdle Pain (PGP)</b>	Evaluate, classify and treat according to MDT classification, using all principles and progressions, If no mechanical syndrome present, evaluate the appropriateness / effectiveness of an SI-Belt and use it as a trial treatment. Explore the influence of aggravating activities and address these through education on posture and awareness of the aggravating activities. General exercise can be encouraged.
<b>Spinal Stenosis</b>	Education on the nature of the problem. Evaluate for movements and/or positions that the patient can use for pain relief. If appropriate initialise a remodelling programme for adjacent spinal regions and / or peripheral joints (e.g. improve ROM of hip extension). Monitor neurological symptoms and refer to a spine surgeon if worsening.
<b>Structurally Compromised</b>	Determine if further medical input is needed. If not, can apply evidence-based intervention when available, integrating MDT concepts of produce/increase NW. Assist and guide in recovery of function.
<b>Trauma/Recovering Trauma</b>	Follow stages of recovery, provide appropriate loading strategies, produce/ increase NW, progression of forces, posture education, self-management. If recovery is poorer than expected then reassess classification and treat as assessment dictates.



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## MODULE SIX:

### CASE STUDIES

#### **OBJECTIVES**

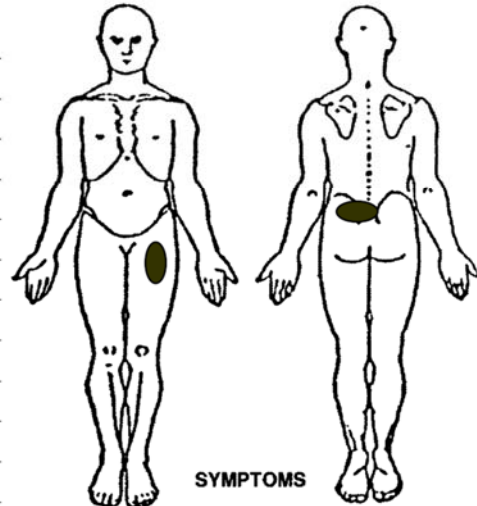
**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Analyse case studies presented on McKenzie Assessment forms and using MDT clinical reasoning principles determine the presence of Derangement, Dysfunction and Postural Syndrome.
2. Analyse case studies presented on McKenzie Assessment forms and using MDT clinical reasoning, differentiate the presence of serious pathology.
3. Analyse case studies presented on McKenzie Assessment forms and using MDT clinical reasoning, differentiate the presence of OTHER subgroups.
4. Analyse the findings of the assessment forms and using clinical reasoning, design a management plan for the provisional classification.



## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name **Fred** Sex **(M)** / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age **48**  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical Stresses **Sitting++, usually in car**  
\_\_\_\_\_  
Leisure: Mechanical Stresses **Sedentary**  
Functional Disability from present episode \_\_\_\_\_  
Functional Disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present Symptoms \_\_\_\_\_  
Present since **6 Months** Improving / Unchanging / **(Worsening)**  
Commenced as a result of \_\_\_\_\_ **(Or no apparent reason)**  
Symptoms at onset: **(back)** / thigh / leg \_\_\_\_\_  
Constant symptoms: **(back)** / thigh / leg \_\_\_\_\_ Intermittent symptoms: back / **(thigh)** / leg  
Worse **bending** ~~sitting / rising~~ **(standing)** ~~walking~~ **(lying)**  
~~am / as the day progresses / pm~~ **(when still)** on the move  
other **Anterior thigh pain comes on with driving**  
Better ~~bending~~ ~~sitting~~ ~~standing~~ ~~walking~~ ~~lying~~  
~~am / as the day progresses / pm~~ ~~when still~~ **(on the move)**  
"hardly sleeps" other \_\_\_\_\_  
Disturbed Sleep **(Yes)** / No Sleeping postures: prone / sup / **(side R / L)** Surface: **(firm)** / soft / sag  
Previous Episodes 0 1-5 6-10 11+ Year of first episode \_\_\_\_\_  
Previous History **None**

Previous Treatments **PT 2-3 months: stretching, mobilisations...No effect at all**

### SPECIFIC QUESTIONS

Cough / Sneeze / Strain / +ve / **(-ve)** Bladder: **(normal)** / abnormal Gait: **(normal)** / abnormal  
Medications: Nil / NSAIDS / **(Analg)** / Steroids / Anticoag / Other \_\_\_\_\_  
General Health: Good / **(Fair)** / Poor **Abdominal Aortic Aneurysm 2010...monitored and "stable" recently**  
Imaging: Yes **(No)** \_\_\_\_\_  
Recent or major surgery: Yes **(No)** \_\_\_\_\_ Night Pain: **(Yes)** / No \_\_\_\_\_  
Accidents: Yes / **(No)** \_\_\_\_\_ Unexplained weight loss: **(Yes)** / No \_\_\_\_\_  
Other: **3 kgs (6.6 pounds) in 2 months**

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## EXAMINATION

### POSTURE

Sitting: Good / **Fair** / Poor Standing: Good / **Fair** / Poor Lordosis: **Red** / Acc / Normal Lateral Shift: Right / Left / **Nil**  
Correction of Posture: Better / Worse / **No effect** Relevant: Yes / No  
Other Observations: \_\_\_\_\_

### NEUROLOGICAL

Motor Deficit ☒ Reflexes ☒  
Sensory Deficit ☒ Dural Signs \_\_\_\_\_

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion				<input checked="" type="checkbox"/>	No
Extension				<input checked="" type="checkbox"/>	No
Side Gliding R				<input checked="" type="checkbox"/>	No
Side Gliding L				<input checked="" type="checkbox"/>	No

**TEST MOVEMENTS** Describe effect on present pain – During: produces, abolishes, increases, decreases, no effect, centralising, peripheralising. After: better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
<b>Pretest symptoms standing: (L) LBP</b>					
FIS	NE				
Rep FIS	NE				
EIS	Increase (L) LBP (min)				
Rep EIS	Increase (L) LBP	NW			<input checked="" type="checkbox"/>
<b>Pretest symptoms lying: (L) LBP</b>					
FIL	NE				
Rep FIL	NE				
EIL	NE				
Rep EIL	NE				
<b>If required pretest symptoms:</b>					
SGIS – R					
Rep SGIS - R					
SGIS - L					
Rep SGIS- L					

### STATIC TESTS

Sitting slouched **NE** Sitting erect **NE**  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement Dysfunction Posture Other  
Derangement: Pain location \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Mechanical Therapy: Yes / No \_\_\_\_\_  
Extension Principle: \_\_\_\_\_ Lateral Principle: \_\_\_\_\_  
Flexion Principle: \_\_\_\_\_ Other: \_\_\_\_\_  
Treatment Goals: \_\_\_\_\_

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## **Case Study: Fred**

### **Provide support for your answers**

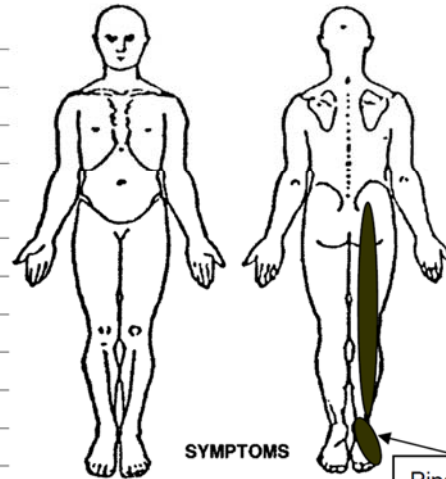
1. From the body chart what provisional classifications can you exclude?  
\_\_\_\_\_  
\_\_\_\_\_
2. In the Worse / Better section is there an indication of a Directional Preference?  
\_\_\_\_\_  
\_\_\_\_\_
3. Are there Red flags present in the specific questions?  
\_\_\_\_\_  
\_\_\_\_\_
4. Based on the information gained from the History, are the symptoms typical of Derangement, Dysfunction or Postural syndrome?  
\_\_\_\_\_  
\_\_\_\_\_
5. What is the unusual feature of the movement loss section?  
\_\_\_\_\_  
\_\_\_\_\_
6. Do the findings of the repeated movement section confirm the presence of Derangement, Dysfunction or Postural syndrome?  
\_\_\_\_\_  
\_\_\_\_\_
7. What is your provisional classification today?  
\_\_\_\_\_  
\_\_\_\_\_
8. What will your management be today?  
\_\_\_\_\_  
\_\_\_\_\_





## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name **Cindy** Sex M ☐ F ☒  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age **43**  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical Stresses **50% sit, 50% stand/walk, some bending**  
Leisure: Mechanical Stresses **Sedentary, mostly sit**  
Functional Disability from present episode \_\_\_\_\_  
Functional Disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



Pins and needles

### HISTORY

Present Symptoms \_\_\_\_\_  
Present since **4 months** Improving / **Unchanging** / Worsening  
Commenced as a result of **Episode of "sciatica"** Or no apparent reason  
Symptoms at onset: **back / thigh / leg**  
Constant symptoms: back / thigh / leg Intermittent symptoms: **back / thigh / leg**  
Worse **bending** Sitting / rising standing **Walking fast** lying  
am / as the day progresses / pm when still / on the move  
other **Long sitting**  
Better bending **sitting** **standing** walking **lying**  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed Sleep Yes / **No** Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous Episodes 0 **1-5** 6-10 11+ Year of first episode \_\_\_\_\_  
Previous History **A few brief episodes of LBP prior to 4 months ago when had first episode of leg pain.**  
Previous Treatments **None**

### SPECIFIC QUESTIONS

Cough / Sneeze / Strain / +ve / **-ve** Bladder: **normal** / abnormal Gait: **normal** / abnormal  
Medications: Nil / **NSAIDS** / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General Health: **Good** / Fair / Poor \_\_\_\_\_  
Imaging: **Yes** / No **X-Ray: Degenerative disc disease**  
Recent or major surgery: **Yes** / No **Melanoma removal 1 year ago** Night Pain: Yes / **No**  
Accidents: Yes / **No** Unexplained weight loss: Yes / **No**  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting: Good / Fair / **Poor** Standing: Good / **Fair** / Poor Lordosis: Red / Acc / **Normal** Lateral Shift: Right / Left / **Nil**  
Correction of Posture: Better / Worse / **No effect** Relevant: Yes / No  
Other Observations: \_\_\_\_\_

### NEUROLOGICAL

Motor Deficit ☒ Reflexes ☒  
Sensory Deficit ☒ Dural Signs **® SLR +ve**

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion		<input checked="" type="checkbox"/>			<b>Leg</b>
Extension				<input checked="" type="checkbox"/>	<b>None</b>
Side Gliding R				<input checked="" type="checkbox"/>	<b>None</b>
Side Gliding L				<input checked="" type="checkbox"/>	<b>None</b>

**TEST MOVEMENTS** Describe effect on present pain – During: produces, abolishes, increases, decreases, no effect, centralising, peripheralising. After: better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
Pretest symptoms standing: Nil					
FIS	Produce ® leg ERP				
Rep FIS	Produce ® leg	NW			✓
EIS	NE				
Rep EIS	NE				
Pretest symptoms lying: Nil					
FIL	NE				
Rep FIL	NE				
EIL	NE				
Rep EIL	NE				
If required pretest symptoms:					
SGIS – R					
Rep SGIS - R					
SGIS - L					
Rep SGIS- L					

### STATIC TESTS

Sitting slouched **NE** Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting **Produce ® Leg**

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement Dysfunction Posture Other  
Derangement: Pain location \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Mechanical Therapy: Yes / No \_\_\_\_\_  
Extension Principle: \_\_\_\_\_ Lateral Principle: \_\_\_\_\_  
Flexion Principle: \_\_\_\_\_ Other: \_\_\_\_\_  
Treatment Goals: \_\_\_\_\_

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## **Case Study: Cindy**

### **Provide support for your answers**

1. From the body chart what provisional classifications can you exclude?

---

---

2. In the Worse / Better section is there an indication of a Directional Preference?

---

---

3. Are there Red flags present in the specific questions?

---

---

4. Based on the information gained from the History are the symptoms typical of Derangement, Dysfunction or Postural syndrome?

---

---

5. What is the significant feature of the movement loss section?

---

---

6. Do the findings of the repeated movement section confirm the presence of Derangement, Dysfunction or Postural syndrome?

---

---

7. What is your provisional classification today?

---

---

8. What will your management be today?

---

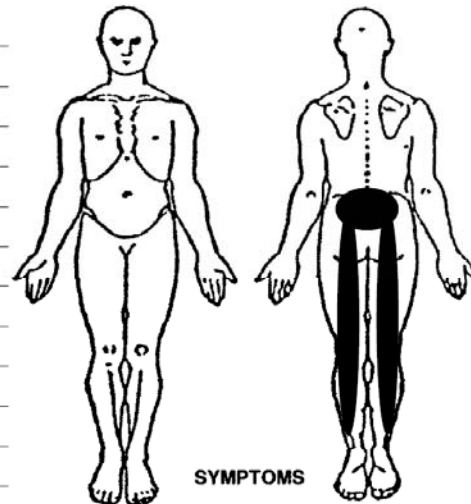
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## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name Arthur Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 67  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical Stresses Retired  
Leisure: Mechanical Stresses Mostly sedentary, hiking  
Functional Disability from present episode Limited walking  
Functional Disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present Symptoms \_\_\_\_\_  
Present since 6 Months Improving / Unchanging / Worsening  
Commenced as a result of Or no apparent reason  
Symptoms at onset: back / thigh / leg  
Constant symptoms: back / thigh / leg Intermittent symptoms: back / thigh / leg  
Worse bending Sitting / rising standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Better bending sitting standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed Sleep Yes / No Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous Episodes 0 1-5 6-10 11+ Year of first episode 15 years ago  
Previous History LBP, episodic for many years, no previous leg symptoms

Previous Treatments Ultrasound, general exercises...minimal help

### SPECIFIC QUESTIONS

Cough / Sneeze / Strain / +ve / -ve Bladder normal / abnormal Gait normal / abnormal  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General Health: Good / Fair / Poor Well controlled diabetes  
Imaging: Yes / No X-Ray: Degenerative disc disease  
Recent or major surgery: Yes / No Night Pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting: Good / Fair / Poor Standing: Good / Fair / Poor Lordosis: Red / Acc / Normal Lateral Shift: Right / Left / Nil  
Correction of Posture: Better / Worse / No effect Relevant: Yes / No  
Other Observations: \_\_\_\_\_

### NEUROLOGICAL

Motor Deficit ✓ Reflexes ✓  
Sensory Deficit ✓ Dural Signs Negative SLR

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion				✓	
Extension		✓			LBP
Side Gliding R			✓		
Side Gliding L			✓		

**TEST MOVEMENTS** Describe effect on present pain – During: produces, abolishes, increases, decreases, no effect, centralising, peripheralising. After: better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
Pretest symptoms standing: Nil					
FIS	NE				
Rep FIS	NE				✓
EIS	Produce LBP				
Rep EIS	Produce LBP , ® calf	NW			✓
Pretest symptoms lying: Nil					
FIL	NE				
Rep FIL	NE				✓
EIL	Produce LBP				
Rep EIL	Produce LBP, bilateral leg pain	NW			✓
If required pretest symptoms:					
SGIS – R					
Rep SGIS - R					
SGIS - L					
Rep SGIS- L					

### STATIC TESTS

Sitting slouched NE Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement Dysfunction Posture Other  
Derangement: Pain location \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Mechanical Therapy: Yes / No \_\_\_\_\_  
Extension Principle: \_\_\_\_\_ Lateral Principle: \_\_\_\_\_  
Flexion Principle: \_\_\_\_\_ Other: \_\_\_\_\_  
Treatment Goals: \_\_\_\_\_

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## **Case Study: Arthur**

### **Provide support for your answers**

1. From the body chart what provisional classifications can you exclude?  
\_\_\_\_\_  
\_\_\_\_\_
2. In the Worse / Better section is there an indication of a Directional Preference?  
\_\_\_\_\_  
\_\_\_\_\_
3. Are there Red flags present in the specific questions?  
\_\_\_\_\_  
\_\_\_\_\_
4. Based on the information gained from the History are the symptoms typical of Derangement, Dysfunction or Postural syndrome?  
\_\_\_\_\_  
\_\_\_\_\_
5. What is the significant feature of the movement loss section?  
\_\_\_\_\_  
\_\_\_\_\_
6. Do the findings of the repeated movement section confirm the presence of Derangement, Dysfunction or Postural syndrome?  
\_\_\_\_\_  
\_\_\_\_\_
7. What is your provisional classification today?  
\_\_\_\_\_  
\_\_\_\_\_
8. What will your management be today?  
\_\_\_\_\_  
\_\_\_\_\_



This image shows a full page of blank white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings on the page.



# MECHANICAL DIAGNOSIS AND THERAPY – LOWER LIMB



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## MODULE SEVEN:

### EPIDEMIOLOGY/EVIDENCE BASE FOR MDT

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Describe the major epidemiological factors associated with lower extremity conditions.
2. Describe the concept of 'natural history' in the resolution of extremity pain.
3. Describe and discuss the current evidence on the use of MDT for lower extremity conditions.



**Objective 1: Describe the major epidemiological factors associated with lower extremity conditions.**

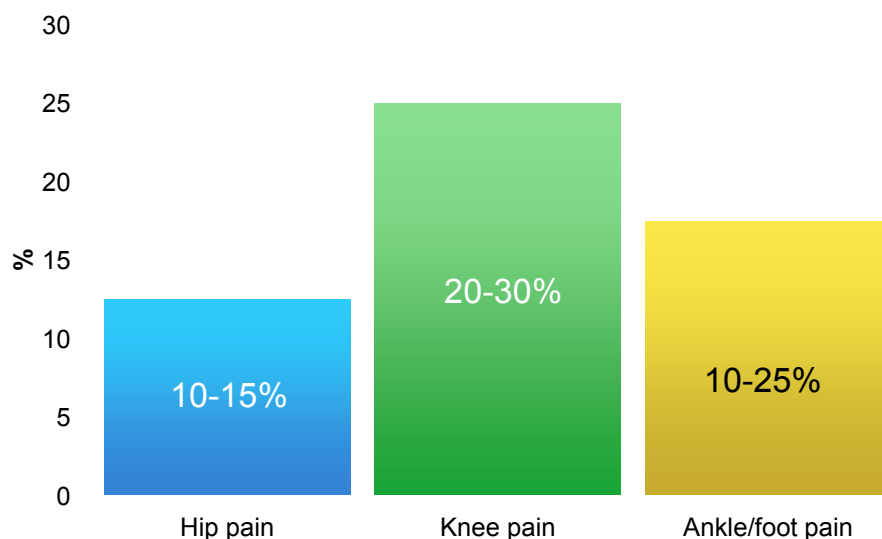
**Objective 2: Describe the concept of 'natural history' in the resolution of extremity pain.**

### **Lower Extremity Joint Pain**

Hip and knee pain is common in most populations, though the prevalence rates vary between regions (Nevitt 2002, Cecchi 2008). Ankle/foot pain is common in the older population, but has been studied less extensively (Thomas M 2011).

Estimates of the 1-year pain prevalence rates vary, as can be seen in the chart below. The incidence of knee pain tends to be about double that of hip pain (Thiem 2013). Hip pain estimates are also less precise due to it being more difficult to define and differentiate from pain of low back origin (Birrell 2005).

General population 1 year prevalence rates



The prevalence rates in population studies for having both hip and knee pain has been reported at 5-7%. All lower extremity joint pain shows consistently more prevalence in women compared to men.

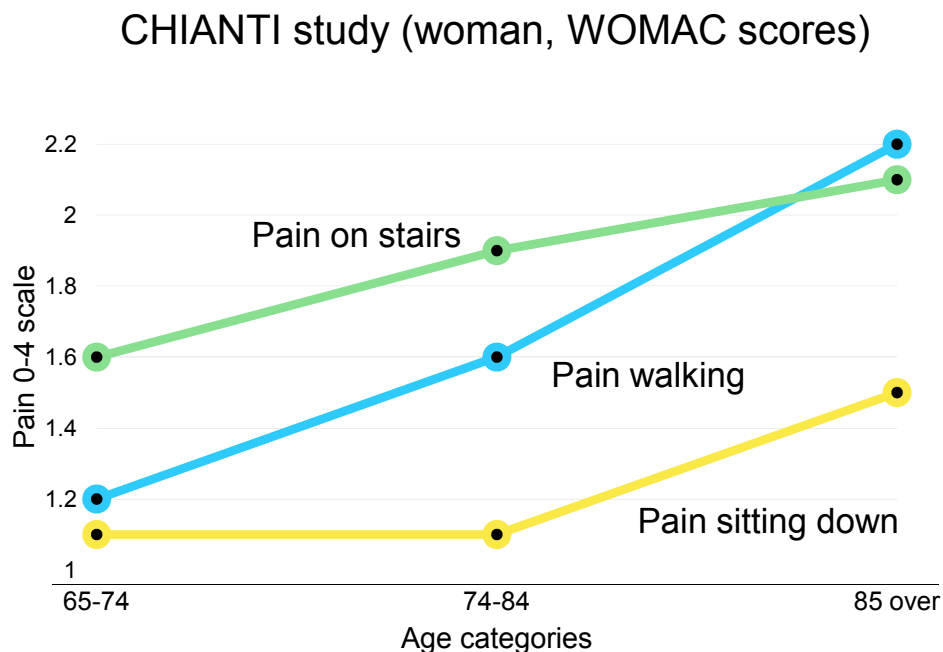
There is a clear trend of increasing prevalence of symptomatic knee osteoarthritis with age, though regional variations can be quite dramatic; some cultures experience much more limited increases with age than others (Woolf, 2003). This may be due to genetic, environmental or activity related factors.

Hip and ankle/foot pain show similar trends of increasing prevalence with age.

It is interesting to note that most regional pain declines in prevalence at the oldest age, but hip, knee and foot pain are the exceptions (Thomas E 2004).

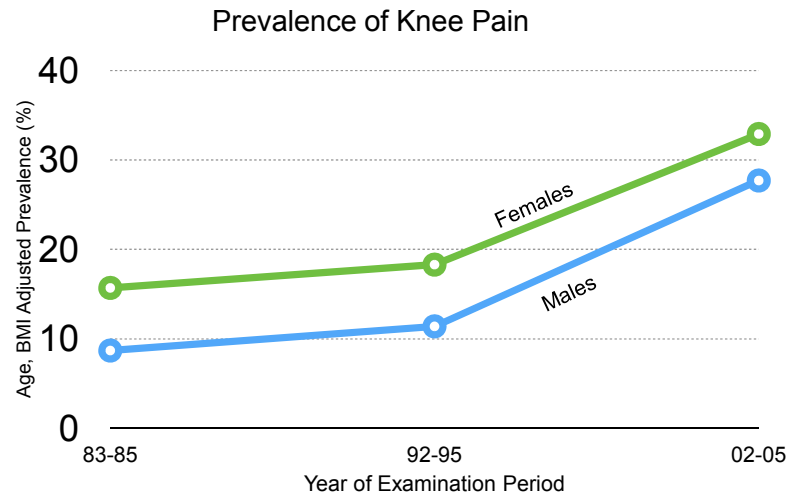
There is also a relationship between pain interference and age; the impact on everyday life activities increases sharply with age (Thomas E 2004). There is an associated increase in disability and decrease in health-related quality of life (Thiem 2013). Ankle/foot pain results in moderate disability in two thirds of cases and adversely impacts quality of life (Thomas M 2011, Hill 2008).

The chart below shows some of pain scores related to function; deterioration with aging of those with hip pain is illustrated (Cecchi 2008).



Recovery can be slow or limited; in primary care only 25% reported recovery of knee pain at 3 months and only 44% at 12 months.

A trend of increasing prevalence of knee pain over a 20-year period has been described (Nguyen 2011) and is illustrated in the chart below; this is independent of age and BMI. Additionally, this was not associated with any increase in radiographic osteoarthritis. These increases may help to explain the surge in knee joint replacement surgeries in some countries and the associated costs. In 2009 total knee replacement surgery cost \$28.5 billion in the USA with hip replacements costing \$13.7 billion.



Data from Framingham Osteoarthritis Study

Some lower extremity joint pain can have an association with sport and activity from a younger age and may be seen more frequently in specialist centres. Patellofemoral pain can comprise 25% of all new running injuries and some of these problems can start during adolescence and be prolonged and persistent (van Linschoten 2009). One multicentre study showed a 55% and 40% unfavourable recovery for patellofemoral pain at 3 and 12 months respectively, regardless of intervention (Collins 2013). Injuries that 'structurally compromise' the joint are also more common in the young athletic population. ACL ruptures have been reported to occur as much as 1.6 per 1,000 player hours for female handball players, with female athletes suffering from ACL injuries 4-6 times more than males (Yoo 2010). These injuries can be challenging to the return to previous levels of activity as well as being a threat to long-term knee health. Even after reconstructive surgery, success is not guaranteed (Snyder-Mackler 2011).

Many commonly used diagnostic tests for specific knee and hip pathology lack consistent reliability between testers and lack consistent validity across multiple high quality studies (Hegedus 2007, Reiman 2013). Many of the diagnostic labels given to lower extremity problems, such as 'hip bursitis' or 'patellofemoral syndrome' lack sufficient diagnostic criteria and diagnostic accuracy (Woodley 2008, Cook 2010).

### **Lower Extremity Soft Tissue Pain**

There is less research regarding the incidence of soft tissue lower extremity pain in the general population, but prevalence rates have been shown to be higher and have been studied more extensively in athletic populations. A Dutch study on the incidence of Achilles tendon problems shows a rate of 2.35 per 1,000 GP patients (de Jonge 2011), this compares with reported rates of 7-9% in distance runners (Lysholm 1987), accounting for approximately 18% of all running injuries (Magnussen 2009). The prevalence of Achilles problems tends to peak in the middle-aged population and tends to be more prevalent in males (Maffulli 2003).

This is mirrored in other lower extremity tendon problems; patellar tendinopathy has shown rates as high as 45% and 32% in volleyball and basketball players respectively (van der Worp 2011).

Pain in these tendinopathies can often be recurring and persistent, may result in the limitation or the prevention of participation and can be harmful to sporting careers (Cook 2001) as well as upon everyday activities (Malliaras 2013). One study of an athletic population showed a mean duration of 18.9 months for patellar tendinopathies (Zwerver 2011).

Other common lower extremity tendinopathies, including hamstring and adductor problems have the same reported persistence and recurrence. Again, these more commonly affect the physically active population, but can also be present in sedentary people. Tendinopathies can be challenging to rehabilitate and recovery can be prolonged.

Other soft tissue problems can be present in the lower extremity; some are very common, such as plantar fascia syndrome, occurring in as much as 10% (lifetime prevalence) of the US population (McPoil 2008). Others such as peripheral nerve entrapments and vascular problems are much less common in the general population though can occur more in specific populations.

## **Summary and Implications**

Lower extremity pain is common in most populations. Joint problems are usually found to increase in prevalence with age and are associated with increased levels of disability and decreased quality of life. There are some examples in populations where the incidence has increased over decades. Some joint injuries can occur frequently in the younger athletic population, these can be persistent and may have long-term consequences. Lower extremity tendon problems are more frequent in middle age and although can occur in the general population they have a greater prevalence in the physically active. Pain in all these conditions tends to be persistent and recurrent despite treatment. Many diagnostic orthopaedic tests lack accuracy and many commonly used diagnostic labels lack sufficient criteria.

The associated burden of these musculoskeletal problems on society is considerable and mounting. There are major implications for conservative musculoskeletal care; management needs to focus on interventions that provide long-term solutions. To achieve this, self-management provides the ideal; patients need to be given the tools to treat their current lower extremity problems and prevent recurrences independently. Providing short-term relief has little place when conditions are persistent and recurrent. Current management and practice does not seem to be having a significant impact on speeding the recovery of these problems and their associated costs and burden to society continue to rise. This justifies the exploration of new approaches that are focused on helping patients to help themselves with long-term strategies for self-management and prophylaxis.

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**Objective 3: Describe and discuss the current evidence on the use of MDT for lower extremity conditions.**

**1. Classification - Reliability**

Two reliability studies have explored the ability of clinicians to agree on MDT classifications in all of the extremities using assessment sheets.

Kelly et al. (2008)

A pilot study found 82% agreement, kappa 0.70.

May S and Ross J (2009).

Follow-up study with 97 experienced McKenzie clinicians evaluating 25 patient vignettes from clinical practice found 92% agreement, kappa 0.83

*These are good to excellent levels of classification reliability, suggesting that clinicians are able to agree on extremity classification to suggest it is a valid and robust system.*

**2. Classification – Prevalence**

May S (2006)

Summary of surveys of clinical practice conducted to determine prevalence of MDT classifications in the extremities. Consisted of data from multiple practitioners utilising the method in the extremities, and were summarised with data on 753 patients (May 2006).

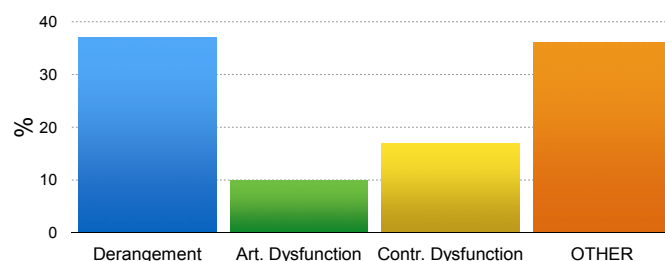
Classification was as follows: Derangement 19%, Articular Dysfunction 26%, Contractile Dysfunction 27%, and other 28%; meaning that 72% were classified with a mechanical syndrome.

May S and Rosedale R (2012)

30 therapists worldwide with data on 388 consecutive patients found a similar proportion (64%) were classified with MDT syndromes.

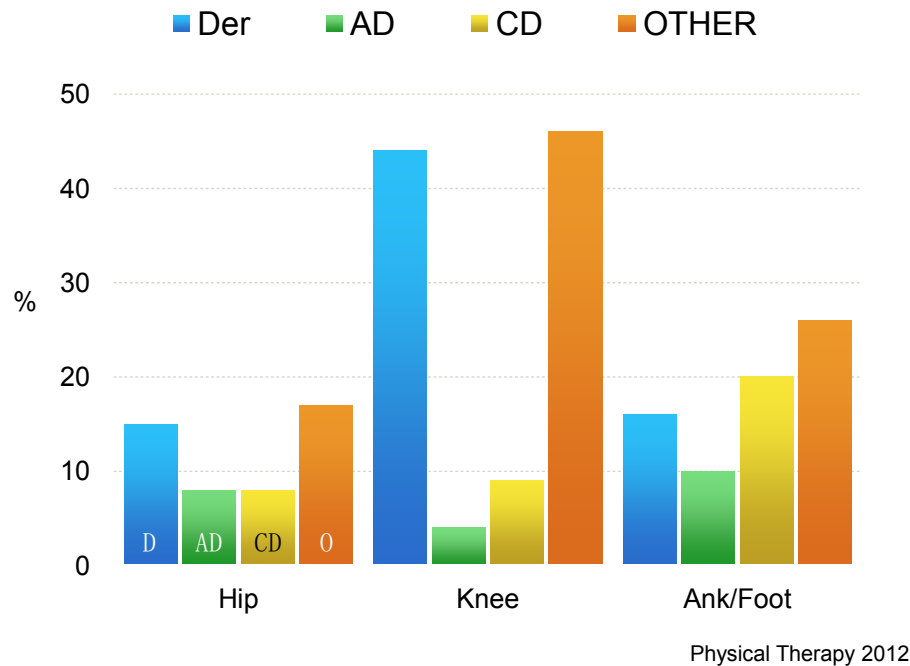
Classification rates were dramatically different to the 2006 survey: Derangement 37%, Articular Dysfunction 10%, Contractile Dysfunction 17%, and other 36%.

2012 MDT Extremity Survey



The rise in those classified with Derangement may indicate a learning process in recognition of this syndrome, and the importance of experience in, and continued application of, the MDT Method to maximise its potential.

The distribution of the classifications in the lower extremity is illustrated below. As can be seen Derangements and OTHER's tend to predominate at the hip and knee with Contractile Dysfunction and OTHER's being classified more frequently at the ankle/foot.



It is important to note that in this survey of 388 consecutive patients, 100% were classified within the McKenzie System, this substantiates claims of comprehensiveness in its application to the extremities.

### 3. **Classification – Effectiveness and Prognosis**

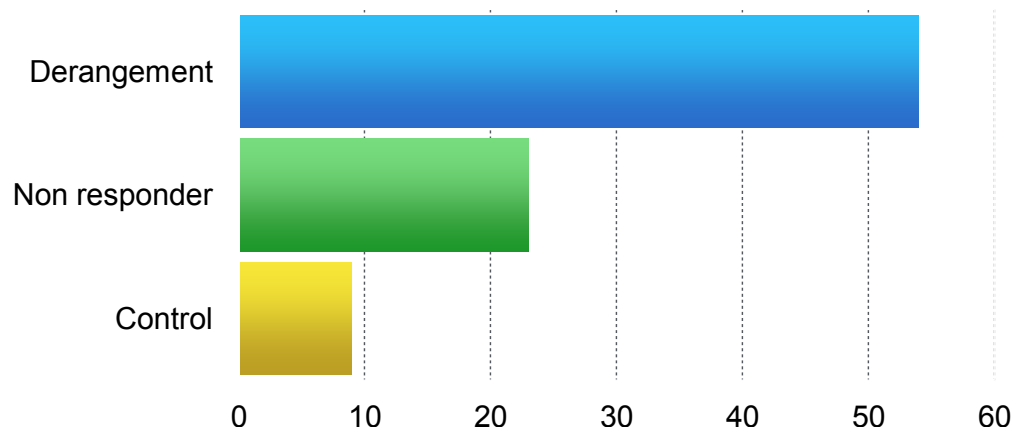
Case studies provide only a weak level of evidence but do give some provisional validity to the method. In the lower extremity there is a knee case report (Lynch G and May S 2013) on a young athlete with a 14 month follow-up. The study documented the classification of Derangement, the establishment of directional preference and the subsequent rapid improvement in pain and the restoration of high level function. The report also demonstrates a phenomenon seen in other upper extremity cases; orthopaedic testing, in this case the McMurray's test for meniscal pathology, was positive at initial baseline and then became negative when the Derangement was on its way to reduction. If positive orthopaedic tests can be made negative after using repeated movements this provides an additional question to their validity and reliability, the problems with which are already well established.

The strongest form of evidence providing proof of effectiveness comes from a randomised controlled trial. So far there has been one trial looking at the efficacy of MDT in the lower extremity and this was with patients with knee pain.

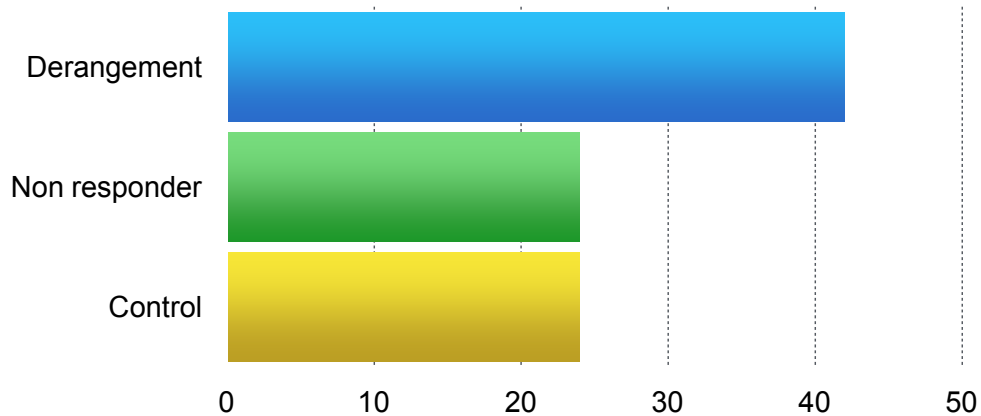
Rosedale R et al (2014)

The strongest evidence for the use of MDT in the extremities comes from a single randomised controlled trial (Rosedale 2014). Patients with knee osteoarthritis (180) were recruited from a tertiary care centre where they had been referred for possible knee replacement, and randomised to an intervention or a control group. The intervention group received an MDT assessment, and those classified as Derangement were given directional preference exercises, whereas those classified as MDT non-responders were given evidence-based exercises. There is plenty of evidence that exercise improves pain and disability in those with knee osteoarthritis. The control group remained on the waiting-list. Pain and function were assessed at two weeks and three months using established outcome measures. When the whole exercise group, Derangements and non-Derangements, were compared to control at two weeks ( $p < 0.01$ ) and three months ( $p < 0.05$ ) they had significantly lower pain and better function. When the Derangements were compared to the non-Derangements in the exercise group the effect sizes were even greater at both 2 weeks and 3 months, though this division was non-random. The chart below shows the proportions of the 3 groups that achieved a true change in pain at the two time points, demonstrating that changes were rapid and lasting in the Derangement group.

% Reaching Minimal Detectable Change in Pain (KOOS) at 2 weeks



% Reaching Minimal Detectable Change Pain (KOOS) at 3 months



This certainly give us some evidence that MDT has some efficacy in determining exercise intervention in patients with OA knee and gives us some provisional indication that better outcomes are achieved with Derangements when given directional preference exercises.

Of those who received an MDT assessment 40% were classified as Derangement, very similar to the 43% of patients with knee problems classified as Derangement in the previous survey (May and Rosedale 2012), which was from, mostly private, standard out-patient clinics. The prevalence rate in very different populations has been found to be similar.

Another interesting finding in the study was the relationship between the degree of osteoarthritis and the classification of Derangement. Contrary to what may have been expected there was a trend for more of the Derangements to have a greater degree of osteoarthritis as measured on the Kellgren-Lawrence Grading Scale. This demonstrates that imaging, even showing severe degeneration, in no way precludes the possibility a Derangement being classified and a rapid response being achieved.

As yet, there have been no studies exploring the use of MDT with other lower extremity joints or classifications. Regarding the use of loaded exercises for Contractile Dysfunction we can draw on, and be guided by, studies related to tendinopathies. The rehabilitation of tendinopathies has been studied extensively in relation to the Achilles tendon (Malliaras 2013, Habets 2015) and the patella tendon (Larsson 2012, Rudavsky 2014). Other work has focused on the adductors (Holmich 2011) and hamstrings (Thorborg 2012). Exercise regimes tend to favour eccentric loading, but alternate regimes have shown effectiveness, including heavy slow resistance (Kongsgaard 2009, 2010) and combined approaches (Silbernagel 2011). The MDT approach of progressively (and painfully) loading contractile tissues is in line with the existing evidence, further study will elucidate the ideal frequency and repetitions.

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## MODULE EIGHT:

### CHARACTERISTICS OF THE MDT SYNDROMES

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Discuss issues relating to the use of a patho-anatomical diagnosis and describe the alternative MDT model of symptomatic and mechanical responses used to identify a mechanical diagnosis.
2. Describe and differentiate the characteristics of the three McKenzie Syndromes - Derangement, Dysfunction (Articular and Contractile) and Postural in the lower extremity.



**Objective 1: Discuss issues relating to the use of a patho-anatomical diagnosis and describe the alternative MDT model of symptomatic and mechanical responses used to identify a mechanical diagnosis.**

## **ANATOMICAL DIAGNOSIS**

Many of the standard orthopaedic tests that are commonly used to make an anatomical diagnosis in musculoskeletal disorders in the extremities have not been shown to be reproducible nor to measure what is intended. If the diagnosis is uncertain then it is an untrustworthy base upon which to establish treatment protocols.

Two key issues relating to common orthopaedic tests have been exposed in the literature - the validity and reliability of the tests used to make these diagnoses. Validity relates to the ability of a measure to be measuring what is intended. Reliability is the extent to which a measure is reproducible, or gives the same results, in different situations (Streiner 1996).

### **Examples:**

- Although within observer agreement of various tests used to evaluate osteoarthritis is moderate to excellent, between observer agreement is poor to moderate (Jones 1992, Cushnaghan 1990).
- For both within and between observer variation, history taking is much more reliably assessed than physical signs, and the agreement between observers about physical signs only was poor (Jones 1992).
- Four commonly used tests to evaluate patellofemoral malalignment have also been shown to have only poor to fair reliability (Kappa = 0.1 to 0.36) (Fitzgerald 1995).

## **MECHANICAL DIAGNOSIS**

The problems of diagnosis for non-specific mechanical disorders of the spine are well documented (Spitzer 1987, Rosen 1994). In order to overcome those difficulties, an alternative system of classifying spinal disorders was proposed by McKenzie (1981).

This system is based on the symptomatic and mechanical responses of patients to various repeated movements or static loading forces (during the mechanical evaluation). It allows the classification of patients into specific categories that direct treatment.

Rather than seeking to make a tissue-specific diagnosis, which is the identification of a disease by means of its signs and symptoms, the McKenzie system concentrates on syndrome identification. A syndrome is a characteristic group of symptoms, and pattern of responses characteristic of a particular problem. The system is now widely used to classify and treat patients with mechanical spinal disorders.



The same issues that have undermined and questioned the patho-anatomical model in the spine are now being recognised in the extremities. A standardised non-patho-anatomic classification system that can be reliably applied to all joints is recommended. (McKenzie and May 2000, Lewis 2009, Schellinghout et al. 2008). In particular, this is due to the poor criteria for present diagnostic labels (Schellinghout et al. 2008), the questionable reliability of most orthopaedic tests (May et al. 2010, Nomden et al. 2009, Walsworth et al. 2008, Hegedus et al. 2008, Hughes et al. 2008) and the questionable validity of commonly used orthopaedic tests to identify the patho-anatomical structures that they are actually meant to (Beaudreuil et al. 2009, Dessaur et al. 2008, Green et al. 2008, Jackson et al. 2003, Meserve et al. 2008, Mirkovic et al. 2005, Munro and Healey 2009, Scholten et al. 2001, 2003, Solomon et al. 2001). Additionally, there is the confounding effect of pathological findings in asymptomatic individuals, which has been shown to have a high prevalence in the extremities (Boden et al. 1992, Englund et al. 2008, Reilly et al. 2006, Schibany et al. 2004, Silvis et al. 2011). Diagnostic discrimination based on patho-anatomical structures from clinical examination and imaging studies is clearly as problematic in the extremities as it is in the spine.

**Objective 2: Describe and differentiate the characteristics of the three McKenzie Syndromes - Derangement, Dysfunction (Articular and Contractile) and Postural in the lower extremity.**

### **Derangement Syndrome**

#### ***Operational Definition:***

**Derangement** – Derangement Syndrome is a clinical presentation associated with a mechanical obstruction of an affected joint. Directional Preference is an essential feature and Centralisation is an important phenomenon observed in the spine.

- The key requirement of a Derangement classification is lasting abolition or decrease of symptoms, and/or an increase in range of movement, in response to repeated movements in the direction that progressively reduces pain, or less commonly, sustained positions.
- This process can often be achieved rapidly. Days, rather than weeks of exercise are required for the completion of the reduction process in most cases. In some cases reduction can be achieved in a few minutes.
- The conceptual model for Derangements in the extremities may relate to the presence of intra-articular structures, e.g. the menisci in the knee, fat pads or loose bodies.
- Derangement may cause a disturbance in the normal resting position of the affected joint surfaces. This will, in turn, deform the capsule and peri-articular supportive ligaments resulting in pain. Internal displacement of articular tissue of whatever origin can cause pain until such time as the displacement is reduced.



## **Dysfunction Syndrome**

### ***Operational Definition:***

- **Articular Dysfunction** - intermittent pain consistently produced at a restricted end-range with no rapid change of symptoms or range.
- **Contractile Dysfunction** - intermittent pain, consistently produced by loading the musculotendinous unit.

Pain from the Dysfunction Syndrome is caused by mechanical deformation of structurally impaired soft tissues. This abnormal tissue may be the product of previous trauma, or inflammatory or degenerative processes. These events cause contraction, scarring, adherence or adaptive shortening. Pain is felt when the abnormal tissue is loaded.

When structural changes and or impairment affect *joint capsules or adjacent supporting ligaments*, painful *restriction of end range* movements in one or more directions will be experienced.

When structural changes and or impairment affect *contractile muscles or tendons*, pain may be experienced *during resisted movement or loading at any point through the whole range*. The pain on resisted movement will usually occur in one direction, and pain may also be provoked if the tissue can be stretched. In other words, the Dysfunction will impair both types of movement that are required in the normal activity of a muscle - both as it contracts and as it is stretched.

In the Dysfunction Syndrome, pain is never constant and appears only as the affected structures are mechanically loaded. Pain will stop almost immediately on cessation of loading. Patients with Dysfunction Syndrome in extremity tissues are seen more commonly in the clinic than Spinal Dysfunction Syndrome.

When affecting **Articular** structures, the Dysfunction Syndrome is always characterised by intermittent pain and a restriction of *end range movement*. When affecting the **Contractile** elements, the Dysfunction Syndrome is characterised by intermittent pain occurring only during *movement or loading* of the structural impairment.

Pain from the Dysfunction Syndrome will persist until remodelling of the affected structures has occurred. In Dysfunction involving peri-articular structures this will be attained once the range of motion has returned to normal. In Contractile structures the remodelling process must affect both the tissues' ability to contract, as well as to be stretched. This can take months, and in some cases pain persists throughout life.

### ***Differences between Articular and Contractile Dysfunctions***

Contractile Dysfunction behaves in a less predictable way than an Articular Dysfunction. One reason may well relate to the structural changes that occur in contractile (tendon) tissue and the fact that these can be present asymptotically; the patient may only become aware of an issue when the tissue is overloaded and those asymptomatic changes become symptomatic.

It has been observed that the timeframe for the development of a Contractile Dysfunction and the response to exercise may also be less predictable than Articular Dysfunctions. Contractile Dysfunctions can appear insidiously and with a relatively short history.

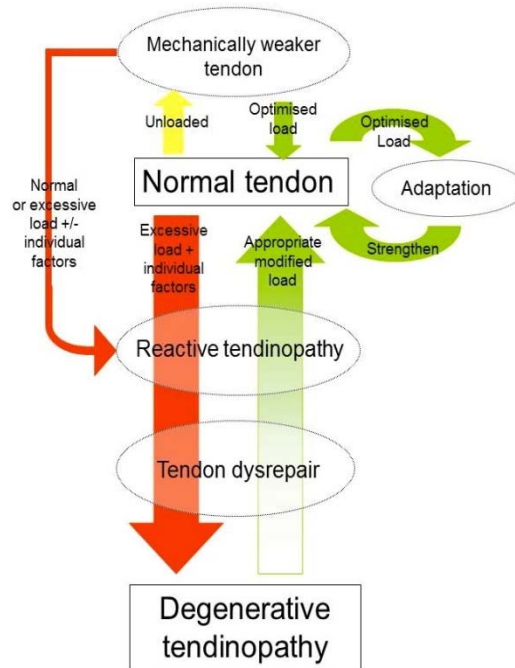
This may explain how in some circumstances the patient responds in a relatively shorter timeframe than expected (days to weeks instead of weeks to months); the tissue may not be fully remodelled and yet it has been stimulated enough through the appropriate exercise to become symptom free. This may also be experienced in the 'acute overload' situation, which has been described in the literature as a 'reactive tendinopathy' (see continuum model from Cook and Purdam, 2009). In this circumstance resolution can occur relatively quickly if the load is withdrawn or reduced and very conservative forces are gradually added to facilitate rapid recovery.

This situation must be differentiated from a classification of 'Trauma' (one of the OTHER subgroups) in which the patient presents with **constant** pain. In this circumstance, all load will worsen the pain and the management is according to the stages of healing. Once the symptoms become intermittent, then the patient may be re-classified; As a Contractile Dysfunction where a graduated loading regime can be implemented, or potentially as a Derangement where a directional preference exercise given or as a subgroup of OTHER where the appropriate management strategy is applied.

In most situations, Contractile Dysfunctions will take 2 - 3 months to resolve with some being more resistant and taking as long as 12 – 18 months. It is important to ensure the patient continues a graduated loading regime (e.g. isometric, concentric, eccentric, plyometric) throughout this entire period. The exercise regimen needs to be progressed to the level where it incorporates exercises that simulate what the patient requires to perform in their daily lives or sport and this needs to be totally individualised.

During the initial physical examination, the Contractile Dysfunction may also have a less predictable response to loading. The typical response to a specific load will be 'Produce pain / No Worse', however sometimes there may be the situation where less pain is produced with each repetition of loading. This type of response has been documented in relation to isometric loading when applied following an acute overload situation (reactive tendinopathy) and may be akin to a "Produce/Better" response. 'Isometric' exercises will thus be the exercise of choice in this initial phase and progressed to a graduated loading regime as indicated.

It is important that clinicians understand the criteria for the Dysfunction classification, but acknowledge that Contractile and Articular Dysfunctions present and respond differently. The principle of management is still always graduated load or repeated movements to induce remodelling based on the consistent patient responses. The clinician needs to be aware however that there may be variability in the responses with Contractile Dysfunction due to the various stages of the pathology.



Ref: Cook JL, Purdam CR. Is tendon pathology a continuum? A pathology model to explain the clinical presentation of load-induced tendinopathy. *Br. J. Sports Med.* 2009; 43;409-416

The principle of management is still always graduated load to induce remodelling based on the consistent patient responses. Unless it is very acute and all load worsens; then it will be classified as "OTHER" – Trauma, and managed accordingly.

It is important that clinicians understand the criteria for the Dysfunction classification, but acknowledge that Contractile and Articular Dysfunctions may present and respond with some differences.

## Postural Syndrome

### Operational Definition:

- **Postural Syndrome** – characterised by intermittent pain brought on only by prolonged static loading of normal tissues. There is no movement loss, and No Effect with repeated movement testing in the Physical Examination.

No pathological changes occur in this syndrome. Pain is only produced by sustained loading, which once avoided rapidly abates.

Pain from the Postural Syndrome is caused by mechanical deformation of soft tissues or vascular insufficiency arising from prolonged positional or postural stresses affecting the Articular structures or the Contractile muscles, their tendons or the periosteal insertions.

When postural pain arises from *joint capsules or adjacent supportive ligaments*, it is the result of *prolonged end range positioning*. Moving from the end range is sufficient to relieve pain immediately. (Remember the "bent finger" model from "Treat Your Own Back").



## MODULE NINE:

### ASSESSMENT

#### **OBJECTIVES**

**With sufficient time to/for practice, participants will be able to meet/achieve the following objectives to:**

1. Demonstrate an understanding of the clinical significance of the components of the MDT assessment.
2. Analyse how the History and the Physical Examination helps to identify precautions and contraindications to mechanical therapy in patients presenting with lower extremity symptoms.
3. Skilfully and accurately complete the History and the Physical Examination of the McKenzie assessment as used for the lower extremity.
4. Conduct and evaluate a relevant spinal assessment to exclude symptoms that are spinal in origin as determined by the History and Physical Examination.
5. Demonstrate an understanding and the appropriate application of terms used in completing the McKenzie Lower Extremity Assessment form.
6. Integrate the results of the History and the Physical Examination including the repeated movement testing to differentiate and determine a provisional classification.

**Objective 1: Demonstrate an understanding of the clinical significance of the components of the MDT assessment.**

**Objective 2: Analyse how the History and the Physical Examination helps to identify precautions and contraindications to mechanical therapy in patients presenting with lower extremity symptoms.**

## **HISTORY**

### **Aims of History Taking:**

Using the form and the appropriate questioning technique at the end of the history taking, ideally, the following will have been obtained:

- An overall impression of the clinical presentation;
- The stage of the disorder – acute / sub-acute / chronic;
- The status of the condition – improving / unchanging / worsening;
- A provisional diagnosis by syndrome and site of lesion;
- Baseline measurements of the symptomatic (and mechanical presentations) against which improvements can be judged;
- Assessing the potential for a relevant spinal component;
- Factors which aggravate and relieve the problem, and which may help guide future management;
- The severity of the problem which may guide the vigour of the physical examination;
- The functional limitations that the condition has caused on the patient's quality of life;
- An impression about the way the patient is responding to their condition, and how much encouragement, information, reassurance or convincing they may need to be active participants in their own management.

### **At the completion of the History**

- It can be helpful at the end of the history taking to briefly sum up your understanding of the problem to the patient.
- You will know the site or sites that will need to be investigated in the Physical Examination.
- You will know the time scale and the mechanism of onset.
- The history will also reveal if the pain is constant or intermittent.
- You will also have an impression of the way the patient has responded to his or her problem.
- Were any Barriers to Recovery identified? If yes, what were they?
- Record a Provisional Diagnosis.



## **PHYSICAL EXAMINATION**

### **Aims of Physical Examination**

Using the form and the appropriate testing procedures at the end of the physical examination, ideally, the following will have been obtained:

- Confirmation or exclusion of relevant spinal component;
- Classification into Derangement, Dysfunction, Postural or OTHER – spinal or extremity;
- Or there may be two competing diagnoses needing further mechanical testing over a few days;
- Baseline measurements of symptomatic and mechanical presentations, functional disability, and present medication consumption against which to judge effects of management strategy;
- Explanation of problem to patient and reason for required exercise programme;
- Time scale for improvement explained to the patient;
- The appropriate loading strategy, or strategies, needed to manage the condition demonstrated to and practised by the patient;
- The repetitions and frequency of exercise programme explained to the patient;
- The expected pain response explained to the patient.

### **At the completion of the Physical Examination**

Consider the following:

- Record a provisional classification – spinal or extremity.
- Is it the same as the one you recorded at the end of the history?
- If not – is further questioning / examination is required?
- What principle of treatment was provided?
- What dosage did you recommend?
- What educational strategies did you utilise?
- What change do you anticipate occurring to the patient's presentation at follow-up?
- How do you think you will change / progress your management at follow-up?
- What is the prognosis for this patient? Short term or long term.

**Objective 3: Skilfully and accurately complete the History and the Physical Examination of the McKenzie assessment as used for the lower extremity.**

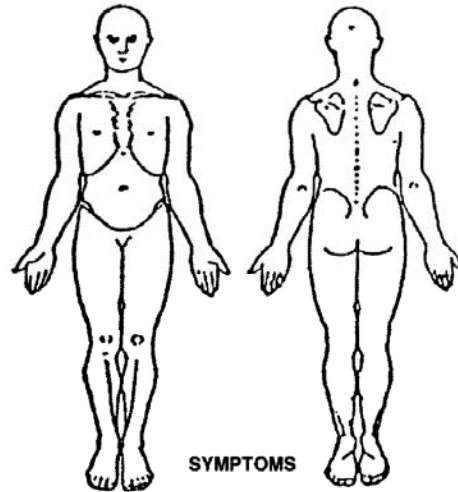
Course participants to practice performing a lower extremity examination.





## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other \_\_\_\_\_  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes \_\_\_\_\_  
Previous treatments \_\_\_\_\_  
General health: Good / Fair / Poor \_\_\_\_\_  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No \_\_\_\_\_  
Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect / NA* Standing: *Good / Fair / Poor*  
Other observations: \_\_\_\_\_

NEUROLOGICAL: *NA / Motor / Sensory / Reflexes / Dural* \_\_\_\_\_

BASELINES (pain or functional activity): \_\_\_\_\_

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

PDM	ERP

Resisted Test Response (pain) \_\_\_\_\_

Other Tests \_\_\_\_\_

### SPINE

Movement Loss \_\_\_\_\_

Effect of repeated movements \_\_\_\_\_

Effect of static positioning \_\_\_\_\_

Spine testing *Not relevant / Relevant / Secondary problem* \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
Other \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_

Exercise and Dosage \_\_\_\_\_

Barriers to recovery \_\_\_\_\_

Treatment Goals \_\_\_\_\_

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## Guidelines for Completion of Lower Extremity Assessment Form

<b>History: Page One</b>	
<i>Patient responses are recorded but supplemented by the clinician as appropriate</i>	
<b>Referral:</b>	Circle the appropriate. May record date of follow-up appointment.
<b>Postures / Stresses:</b>	<p><b>Work: Mechanical stresses:</b> Record work activities and indicate frequency of activity e.g. 30% sitting, 30% standing, 40% on the move.</p> <p><b>Leisure: Mechanical stresses:</b> Record leisure or hobby activities and indicate frequency of activity e.g.; 75% sitting, 25% bending or could say walking 3x week 40 mins, gardening 3hours/week for example.</p>
<b>Functional Disability from Present Episode:</b>	Ask patient about specific activities that they are unable to perform or have difficulty performing because of current symptoms. Quantify if possible.
<b>Functional Disability Score:</b>	Note the test being used, and the score.
<b>VAS Score: (0 – 10)</b>	Patient to rate, average, best and worst intensity of pain on a 0-10 scale. Pain intensity may vary between locations.
<b>Body Chart:</b>	Used to record “all symptoms the patient has experienced this episode” All symptoms may not still be present.
<b>Handedness – Right / Left:</b>	On Upper Extremities Chart only. Circle dominant hand
<b>Present Symptoms:</b>	Record here the location/type of symptoms that are still concerning the patient. May differ from the body chart as not all symptoms may still be present.
<b>Present Since:</b>	Usually given in weeks or days. Can write a specific date if known or if needed for legal reasons.
<b>Improving / Unchanging / Worsening:</b>	Circle as appropriate, and ask patient how, or in what way, if they say they are improving or worsening.
<b>Commenced as a Result of:</b>	If appropriate describe mechanism of injury e.g. lifting and twisting, MVA, injury playing sport. Or circle No Apparent Reason.
<b>Symptoms at Onset:</b>	Circle where symptoms started, and record the timeframe of onset of associated pains.
<b>Spinal History:</b>	Screening for a spinal component, and can be correlated with the Body Chart and the following 2 questions.
<b>Paraesthesia:</b>	Relevant to the patient’s history and pain location?
<b>Cough / sneeze:</b>	Circle if coughing or sneezing reproduces the patient’s symptoms.
<b>Constant / Intermittent:</b>	Circle as appropriate. Qualify the site where required.



<b>History: Page One</b>	
<b><i>Patient responses are recorded but supplemented by the clinician as appropriate</i></b>	
<b>Worse / Better Section:</b>	<p>Recording</p> <p>Circle for always – if not clarified this means immediate pain response. If relates to time need to clarify outside the circle with e.g. 10minutes, prolonged. <i>Line under</i> – sometimes. <i>Oblique line through</i> – no effect.</p> <p>Put a ? above activity if patient still unsure even after further questions, rather than leave blank.</p> <p>If two unrelated areas of pain, may need to indicate if dealing with different pain sites for each activity. Use text for Other options</p>
<b>Continued Use:</b>	As above with circle, or line under for sometimes
<b>Disturbed Night:</b>	If “always” circle Yes, “sometimes” underline Yes. “Not affected” circle No. If was previously circle Yes, but write “previously”. Used for likely mechanical pain, e.g. pain turning in bed or pain related to being in a position
<b>Pain at Rest:</b>	Circle as appropriate. And qualify the site where required
<b>Other questions:</b>	Circle as appropriate and write clarifications if required
<b>Previous Episodes:</b>	Indicate year of first episode
<b>Previous Treatments:</b>	Write what treatments they have had for this episode and, if appropriate what treatments/interventions they have had for previous episodes. May indicate what has helped if appropriate.
<b>Specific Questions (related to Health, Medication, Imaging etc.)</b>	Circle appropriate answers and write any clarifications on the lines provided. Circle Night pain in this section if considered a red flag.
<b>Summary:</b>	Complete with circles, and text as appropriate

<b>Physical Examination: Page Two</b>	
It is not essential to perform all components of the Physical examination with every patient. If any section is not performed an oblique line is drawn through it.	
<b>NB: ALWAYS compare limbs wherever possible during the Physical Examination</b>	
<b>Posture:</b>	Circle appropriate response.
<b>Correction of Posture:</b>	Circle response and indicate which pain changes if appropriate.
<b>Other Observations:</b>	Record any significant musculoskeletal differences, e.g. wasting, swelling, redness etc.
<b>Neurological Examination:</b>	<p>Circle NA for Not Applicable for this patient.</p> <p>Record as Normal if there is no deficit. Qualify which deficit in each section, recorded if abnormal, e.g. decreased S1 reflex. Can add Babinski / Clonus to reflexes if required.</p>
<b>Baselines:</b>	Pain or functional activity. “Is there one thing you can do which always brings on, or increases, your pain?”



Physical Examination: Page Two	
	Could be walking, squatting, steps etc. for lower limb, or reaching, throwing, dressing etc. for upper limb.
<b>Movement Loss: (Circle Relevant Body Site)</b>	Place a tick in the appropriate box. Maj/Mod/Min/Nil Can also record as a tick in the "pain" box, if patient is reporting pain during the movement, indicate location of the pain.
<b>Passive Movements:</b>	Note the symptoms and range for the relevant movement being tested. Always test for end range.
<b>Resisted Test Response:</b>	Note direction tested and if pain or weakness elicited
<b>Other Tests:</b>	State which and the response achieved
<b>SPINE:</b>	
<b>Movement loss:</b>	State direction and extent of loss
<b>Effect of repeated movements:</b>	State direction and the symptomatic and mechanical response
<b>Effect of static positioning:</b>	State position used and symptomatic response
<b>Spine testing:</b>	Circle as appropriate to summarise spinal testing response
<b>Baseline symptoms</b>	State pre-testing baseline symptoms
<b>Repeated movement testing:</b>	<p>Indicate the order performed by numbering if order is different to that written Useful to record the number of repetitions performed to gain the response.</p> <p><b>Symptomatic response</b> - Use standard terms only. Monitor and describe effect on most distal symptoms</p> <p><b>Mechanical response.</b> Indicate which movement has been effected by the change if it is different to the one being tested, and if strength or functional test has changed</p>
<b>Effect of Static positioning:</b>	Record symptomatic and mechanical response.
<b>Provisional Classification:</b>	Circle whether extremity or spinal problem. Circle the classification, <u>Derangement</u> , (name which joint) <u>Dysfunction</u> (indicate type and direction) or <u>OTHER</u> ( name subgroup).
<b>Principle of Management:</b>	<p><b>Education</b> - Record specifics, e.g. posture correction, avoidance of provocative movements. Record equipment provided.</p> <p><b>Treatment principles and Dosage</b> - Indicate the specific exercises given, Indicate dosage – frequency and repetitions.</p> <p><b>Barriers to Recovery</b> – Record any factors that may be a barrier to recovery</p> <p><b>Treatment Goals</b> – Indicate what you expect to change by next visit and things you wish to reassess at Follow-ups</p> <p>Short and Long term goals can be recorded also.</p>

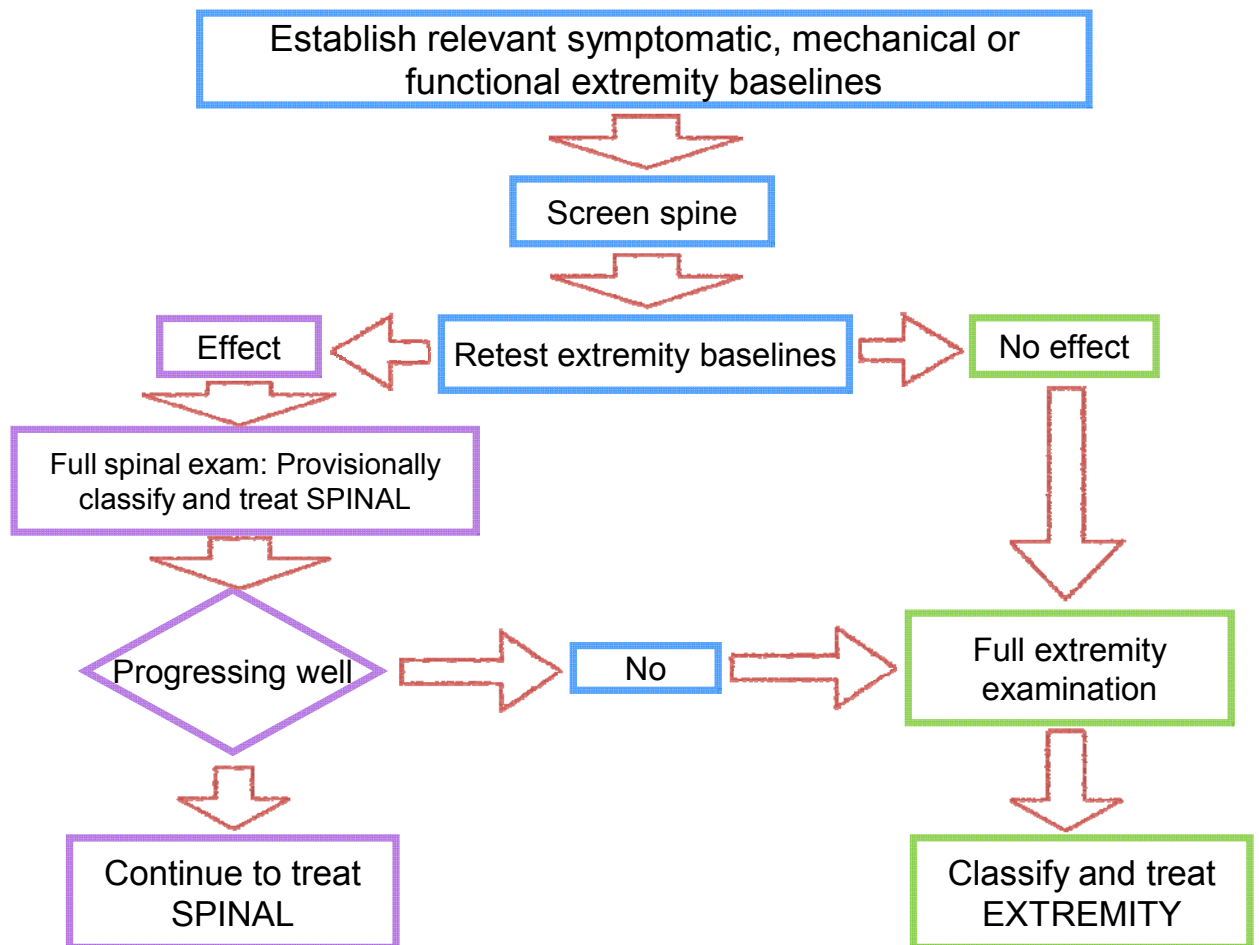


**Objective 4: Conduct and evaluate a relevant spinal assessment to exclude symptoms that are spinal in origin as determined by the History and Physical Examination.**

### **Spinal Extremity Algorithm**

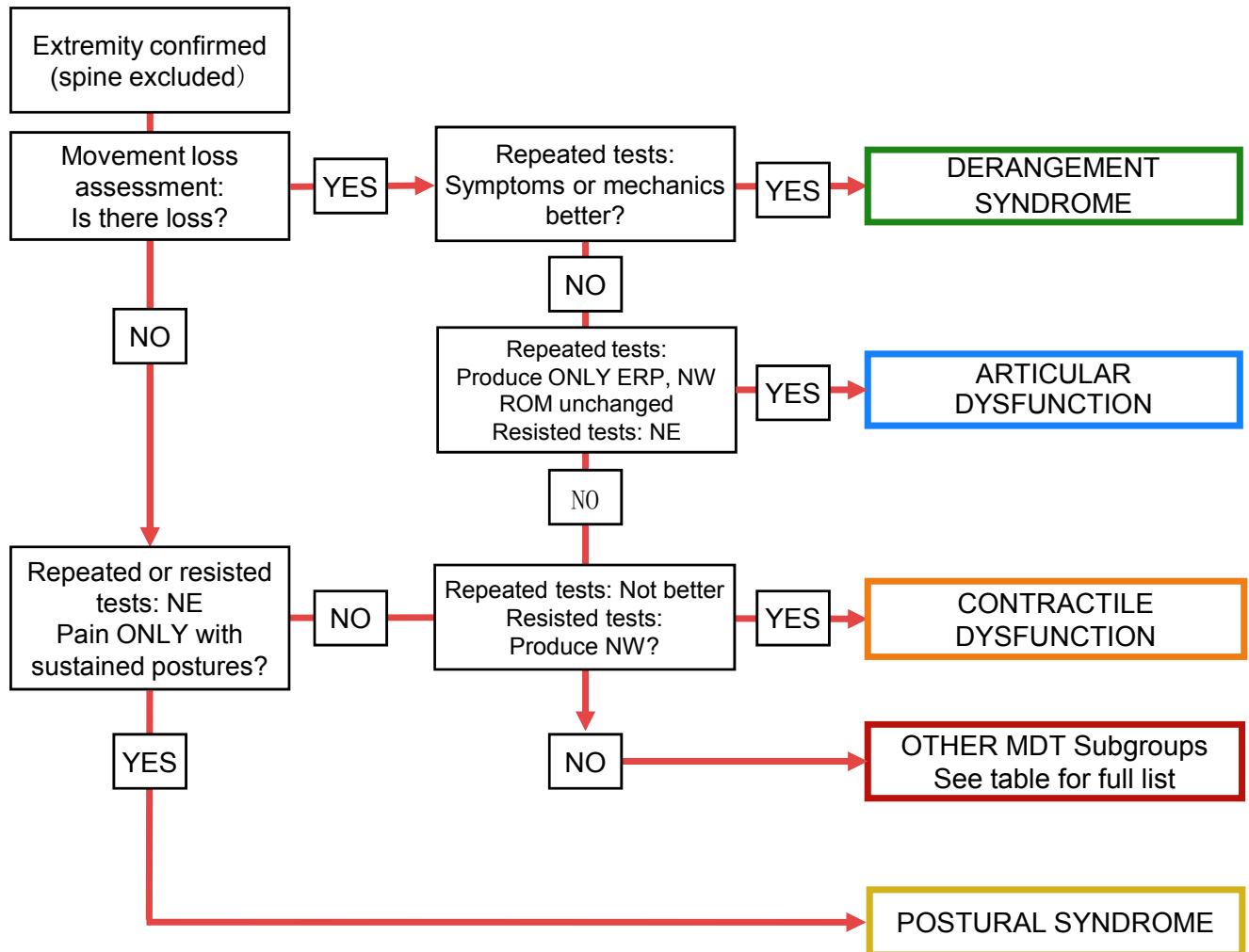
*Use the assessment to determine if the lower extremity symptoms are originating from the lumbar spine*

**“Always Clear the Spine:”**



## **If not the Spine – How to Proceed?**

### **Extremity Algorithm**



**Objective 5:** Demonstrate an understanding and the appropriate application of terms used in completing the McKenzie Lower Extremity Assessment form.

Participants to practice completing MDT Lower Extremity Assessment form for all patients assessed on the course.

**Objective: 6:** Integrate the results of the History and the Physical Examination including the repeated movement testing to differentiate and determine a provisional classification.

Participants to use the findings of the assessments of the patients on the course / case studies to determine a provisional classification.

## MODULE TEN:

### DERANGEMENT SYNDROME

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Describe the key clinical features of Derangement that are seen on the McKenzie Lower Extremity Assessment Form.
2. Discuss and design appropriate management programmes for patients who present with Derangements in the lower extremity.
3. Discuss the concept of progression of forces and the use of force alternatives when treating lower extremity Derangements.
4. Analyse and demonstrate a variety of loading strategies for Derangements seen in the lower extremity, and discuss the rationale for their use.



**Objective 1: Describe the key clinical features of Derangement that are seen on the McKenzie Lower Extremity Assessment form.**

## **Derangement:**

List the **Key** features from the assessment:

### **History**

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### **Physical Examination**

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**Objective 2: Discuss and design appropriate management programmes for patients who present with Derangements in the lower extremity.**

## **Management of Derangement:**

### **General Principle**

The management of Derangements in extremity joints follows the same logical pathway as in the spine. End range movement loading in the specific Directional Preference of the affected joint will progressively reduce pain and usually simultaneously improve the range of motion as the obstruction is reduced. An essential prerequisite for the successful management of patients with Derangements is the patient's thorough understanding of self-management.

### **Education in Self-management**

- The patient must understand the nature and cause of the problem.
- Temporary avoidance of known aggravating factors will be needed in many cases.
- The patient should understand the importance of regularly performing the exercise and the expected responses. If there is a lasting aggravation of pain the exercise should be stopped until re-assessment can occur.
- The patient should perform 10-15 repeats every 2-3 hours, or as often as the symptoms require.





- The clinician should reassess a few days later and evaluate the response to the reductive forces. This will include evaluating how the exercises were performed, the frequency of performance and the immediate effect of the exercises.
- The Traffic Light guide is a helpful tool.

## 1. **Reduction of Derangement**

Due to multiple planes of movements in extremity joints there is substantially more variability in DP in different joints. Generally the more planes of movement that are available at the joint, the greater the variability of reductive directions that may need to be evaluated. Keeping this fact in mind, adhering to a logical sequence as well as exploring force progressions AND force alternatives is essential.

### **How to choose the first movement:**

If there are indications in the patient's history in regards to aggravating and easing movements then this information can help to direct a potential provocative or reductive first movement. However, often the patient's history does not give a definite clue regarding the DP. If this is the case, choose either the movement that relates to the functional limitation of the patient or the one that shows the most obvious movement loss. This strategy often clarifies the clinical picture. It will either reveal the DP or the provocative movement...or it will indicate a different classification.

## 2. **Maintenance of Reduction**

For effective maintenance of reduction, education and patient's complete understanding is the primary focus. The patient must be able to maintain any improvements gained during a treatment session, and also to reverse any deterioration that may happen during normal daily activity. If the patient fails to sufficiently understand the importance of maintenance it is likely the clinician has failed to do their job thoroughly.

### **Maintenance of reduction – key aspects:**

- Regular performance of the reductive procedure.
- If appropriate; postural correction and respective modification of functional habits.
- Temporary avoidance or interruption of aggravating postures, positions and/or movements.

## 3. **Recovery of Function**

It is essential to reintroduce normal movements in all directions following the successful reduction of a Derangement. The clinician should encourage the patient to return to sport / recreational activities and Work as soon as reasonable and if necessary address possible functional deficits. If the overall timeframe of the condition is straightforward, specific interventions may not be necessary. When the patient has avoided their usual activities for a longer time, graded exposure to the demanded tasks accompanied with some specific training may supportive.

Fear-avoidance may also be an issue with extremity patients...and clinicians.



### **Recovery of function – key aspects**

All movements must be made full range and pain free after reduction of Derangement:

- Patients should be made confident to perform their usual activities with a graduated return as required
- Limited loading capacities of adjacent or involved structures may be taken into account.

## **4. Prevention of Recurrence**

A prophylactic programme is individual to each patient, and is guided by their history and physical demands. However, the following are a few of the key points:

- Ensure full and free joint ROM is maintained, especially in the direction of previous obstruction.
- Balance movements in various directions during daily activities.
- Caution with, and education about the consequences of, sustained postures.
- If there were obvious recovery of function deficits, then continue to maintain gains made with a suitable rehabilitation programme.
- Encourage a return to, or promotion of, an active lifestyle, sport, fitness and recreational activities

### **Notes:**

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**Objective 3: Discuss the concept of progression of forces and the use of force alternatives when treating lower extremity Derangements.**

### **Force Progressions**

#### **Patient: Active Movement**

To achieve reduction the patient firstly applies repeated active exercise to end range. Providing the pain becomes progressively less with repetition or the range of movement increases, or both, the patient may continue the basic exercise without modification until recovery is complete. Should improvement plateau, the first progression, as in the spine, is patient self-applied overpressure

#### **Patient Overpressure**

The patient must be instructed how to use his hands or bodyweight to apply overpressure. More forceful over-pressure can be gained using a piece of furniture to assist. If the over-pressure is in the correct direction the extra force will produce more reductive pressure and improvements in mechanical and symptomatic presentations will follow. It is common that patient overpressure needs to be applied early in the reductive process to ensure that end range is reached and lasting improvement achieved.

#### **Clinician Overpressure**

If progress with patient overpressure plateaus or gives a “yellow light” (NB, NW) response, clinician overpressure can be applied. This is applied at end range of the active movement and the symptomatic and mechanical responses are evaluated

#### **Clinician Mobilisation**

If progress with patient forces and with the use of clinician overpressure plateaus, or gives a “yellow light”, then this may be an indication to progress with mobilisation in this direction.

## **Force Alternatives**

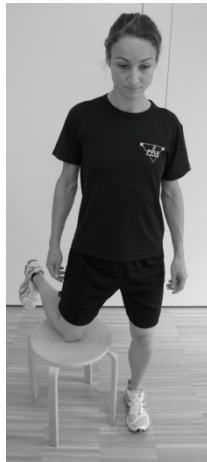
### **Alternative Starting Position and Load**

Change the position of the patient or change the position of the affected joint.

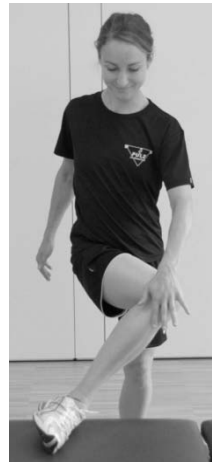
For example:

Hip: The patient can do rotation of the hip in neutral - photo one or in flexion - photo two.

Ankle: Dorsiflexion of the ankle could be done unloaded in supine or in partial loading – putting the foot on a stool.



**One**



**Two**

### **Lateral Component**

Similar to the spine, some Derangements in the extremity joints may present with a relevant lateral component. If movements in the sagittal plane are not effective, you have to evaluate the effect of lateral forces. For example: If sagittal extension of the knee does not fully reduce a Derangement, the knee extension movement can be performed with the hip in either lateral or medial rotation. In doing so, a medial or lateral force is added to the extension movement.



**Objective 4: Analyse and demonstrate a variety of loading strategies for Derangements seen in the lower extremity, and discuss the rationale for their use**

The most common sites for Extremity conditions generally are the knees and shoulders (almost 60% in the 2012 study), and these sites demonstrate a significant prevalence of Derangements. Percentages from the same study for other joints are also included below.

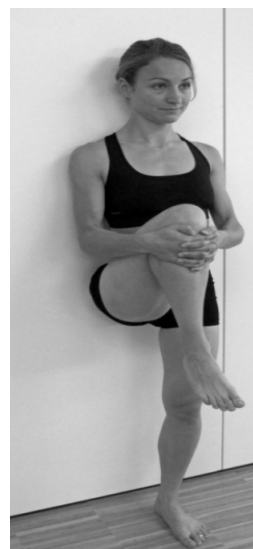
**HIPS: (10% prevalence. 31% Derangements)**

- Patterns of Directional preference – 53% extension responders
- Forces available – e.g. Flexion, flexion with internal rotation, external rotation  
Extension with internal rotation, external rotation,  
Abduction, adduction
- Force progressions – patient O/P, clinician O/P, mobilisation
- Force alternatives – Lying, sitting, kneeling, standing

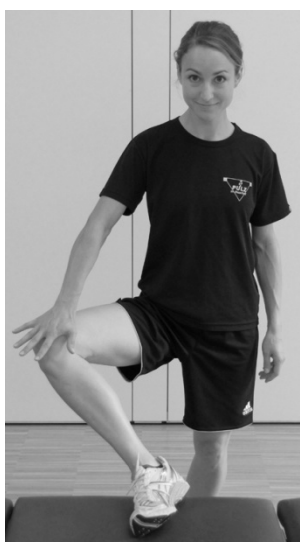
**Hip Extension**



## **Hip Flexion**



## **Hip External Rotation**



## **Hip Internal Rotation**





## KNEES: (26% prevalence. 42% Derangements)

- Patterns of Directional preference – 90% extension responders
  - NB:** The Rosedale OA Knee study demonstrated 40% prevalence of Derangements with 60/40% Flexion / Extension principle.
- Forces available e.g. flexion, flexion with internal rotation / external rotation, extension, extension with internal / external rotation.
- Force progressions – patient O/P, clinician O/P, mobilisation.
- Force alternatives – Lying, sitting, kneeling, standing, resisted at either ER or mid-range, eccentric extension.

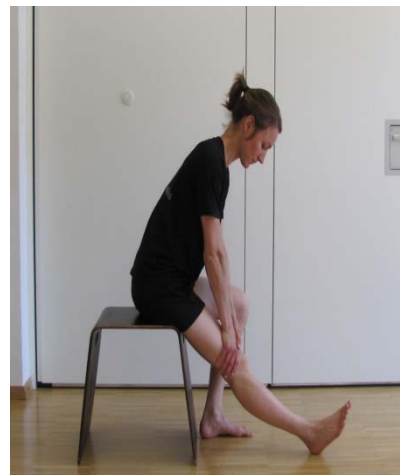
### Extension Procedures:



Extension in sitting



Extension with foot  
on floor



With O/P



Extension in standing

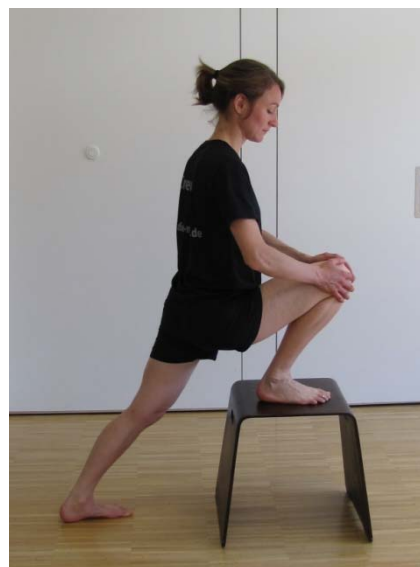


Extension in Standing  
with O/P

**Knee Flexion:**



**Flexion in Sitting**



**Semi Loaded Foot on Stool**



**Flexion Kneeling**

**Notes:**

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### **ANKLES/FEET: (20% prevalence. 22% Derangements)**

- Patterns of Directional preference – 75% dorsi flexion
- Forces available e.g. dorsi flexion, dorsi flexion with inversion, eversion plantar flexion with inversion, eversion
- Force progressions – patient O/P, clinician O/P, mobilisation
- Force alternatives – Lying, sitting, kneeling, standing, combined with knee flexion or extension

#### **Dorsi Flexion:**



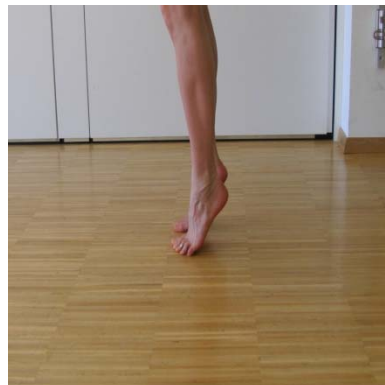
**Loaded**



**Semi loaded – foot on stool**



**Plantar Flexion: Sitting on feet plus O/P**



**Loaded**

**Notes:**

## MODULE ELEVEN:

### DYSFUNCTION SYNDROME

#### **OBJECTIVES**

With sufficient time, participants will be able to meet/achieve the following objectives to:

1. Describe the key clinical features of Articular Dysfunction that are seen on the McKenzie Lower Extremity Assessment form.
2. Discuss and design appropriate management programmes for patients who present with an Articular Dysfunction in the lower extremity.
3. Describe the key clinical features of Contractile Dysfunction that are seen on the McKenzie Lower Extremity Assessment form.
4. Discuss and design appropriate management programmes for patients who present with a Contractile Dysfunction in the lower extremity.
5. Analyse and demonstrate a variety of loading strategies for Contractile Dysfunctions seen in the lower extremity and discuss the rationale for their use.



**Objective 1: Describe the key clinical features of Articular Dysfunction that are seen on the McKenzie Lower Extremity Assessment form.**

## **Articular Dysfunction**

List the **Key** features from the assessment

### **History**

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### **Physical Examination**

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**Objective 2: Discuss and design appropriate management programmes for patients who present with an Articular Dysfunction in the lower extremity.**

## **Management of Articular Dysfunction**

In the case of articular dysfunction, remodelling of the involved structures will require repeated movement loading sufficient to reproduce the patient's pain at *end range*.

### **Self-treatment Procedures Required to Remodel Articular Dysfunction**

- The patient must be instructed actively to move the affected joint towards the restriction until pain is felt.
- The movement should be repeated to the point of pain, ten or twelve times three or four times daily. If this is done without exacerbation of symptoms the exercise should be increased to every two hours.
- In many joints it is only the addition of over pressure that will get the joint to end range.
- Overpressure may thus sometimes be necessary from day one.

### **Discuss Lower Extremity Articular Dysfunctions**

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**Objective 3: Describe the key clinical features of Contractile Dysfunction that are seen on the McKenzie Lower Extremity Assessment form.**

## **Contractile Dysfunction**

List the **Key** features from the assessment

### **History:**

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### **Physical Examination:**

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**Objective 4: Discuss and design appropriate management programmes for patients who present with a Contractile Dysfunction in the lower extremity.**

### **Management:**

#### **Self-treatment Procedures Required to Remodel Contractile Dysfunction**

In the case of contractile dysfunction, the movement that causes the greatest amount of pain also provides the greatest stimulus or irritation to the affected tissues. This will readily be found by testing out those movements described by the patient as being painful, if necessary with resistance. One of these will consistently provoke the patient's pain. Having identified the most painful movement, it is then necessary to find the point in the range where resisted exercises should first be applied.

- Controlled exercise gives repeated tensile loads that stimulate collagen remodelling.
- Controlled static or dynamic loading may be used to remodel contractile dysfunction



in order to restore normal function.

- The exercise programme commences where the loading is sufficient to generate the patient's pain, but abates once the loading ceases.
- Appropriate progressions of resisted exercises or modified techniques should be added as indicated, and progressed to task or sports specific rehabilitation as required.
- The point in the arc of movement that provokes pain or where pain is at its maximum is a reliable guide when deciding where in the range it is best to apply loading for the purpose of remodelling. This is the "target zone" for the patient's focus. If the pain is felt at the same intensity throughout the range it is not necessary to seek a "target zone".
- Having identified the point during the painful movement the patient should then be shown the procedures that will apply either static or dynamic loading sufficient to cause reproduction of the pain.
- The appropriateness of these procedures should be established over a test period and progressions given as necessary. Options available include active movements, static resisted movements and concentric and eccentric loading.
- Exercises can be performed in outer range, inner range, short of the "target zone", and in the "target zone" itself.
- Eccentric loading in particular has been shown to be useful in the rehabilitation of chronic tendon problems.

### Lower Limb Contractile Dysfunctions: MDT Terminology

	Tendinopathy	MDT Terminology
1	Achilles	CD Plantar Flexion
2	Peronei	CD Eversion
3	Tibialis Posterior	CD Inversion
4	Patella	CD Extension
5	Quadriceps	CD Extension
6	Hamstrings (Distal)	CD Knee Flexion
7	Hamstrings (Proximal)	CD Knee Flexion or Hip Extension
8	Gluteus Medius	CD Hip External Rotation <b>and/or</b> Abduction
9	Adductors	CD Hip Adduction





**Objective 5: Analyse and demonstrate a variety of loading strategies for Contractile Dysfunctions seen in the lower extremity and discuss the rationale for their use.**

Eccentric loading, in particular, has been shown to be extremely useful in the rehabilitation of chronic tendon problems. However, it is only one of a variety of potential loading strategies and regimes that can be re-used for modelling purposes. Loading strategies should be graduated and progressed depending on the symptomatic response. E.g.

- 1 Isometric
- 2 Concentric
- 3 Eccentric

Research into the most appropriate type of mechanical loading for the remodelling of tendons is expanding rapidly. Clinicians are encouraged to monitor developments in the literature related to the rehabilitation of tendon pathology and to consider a best evidence approach in combination with MDT principles.

**Knee:**

Example of a typical eccentric loading exercise for the patella tendon.

**Eccentric Loading of Patella Tendon**



Discuss other loading exercise programmes that can be used for the patella tendon.

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### Ankle:

Example of a typical eccentric loading programme for the Achilles tendon.

### Eccentric loading of Achilles



Discuss other loading exercise programmes that can be used for the Achilles tendon.

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## MODULE TWELVE:

### POSTURAL SYNDROME

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Describe the key clinical features of Postural Syndrome that are seen in the McKenzie Lower Extremity Assessment Form.
2. Discuss the principles of MDT management of Postural Syndrome when present in the Lower Extremity.



**Objective 1: Describe the key clinical features of Postural Syndrome that are seen in the McKenzie Lower Extremity Assessment form.**

## **Characteristics of Postural Syndrome**

List the **Key** features from the assessment.

### **History**

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### **Physical Examination**

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**Objective 2: Discuss the principles of MDT management of Postural Syndrome when present in the Lower Extremity.**

## **Management of Postural Syndrome:**

### **▪ *Education Towards Self-management***

The patient should be given an explanation of the cause of the pain and how self-care involves frequent interruption and breaks from the repetitive or sustained activity. If they are not able to avoid the task completely then frequent interruption of the causative position or posture is essential to prevent the condition from worsening. Repetitive full range movement of the affected structures achieves this, if done regularly, e.g. hourly – but rotation of job tasks is a more efficient solution.

Overall body posture should be altered regularly, and be well supported. If work is being performed in constrained or inefficient postures patients need to be informed how to attain and maintain a better working position. They should be warned especially about sustaining abnormal or extreme joint positions. Ergonomic interventions seek to reduce the repetition of tasks, their abnormal mechanical stresses and vibration, and improve working postures. The possible implications of continuing with the same occupational stresses should be made clear to the patient.



- ***Self-treatment Procedures Required***

The patient must be shown how to modify or avoid the causative posture. Teaching the patient to reduce or stop their pain simply by modifying their working posture is an essential step in the prevention of further problems. Encourage people to think that posture is a habit that can be changed over a few weeks if the necessary consciousness is maintained – like all habits it can be changed, but it needs working at.

In certain situations however, it is impossible to alter the physical environment sufficiently to avoid pain. Under these circumstances, patients must be taught repeatedly to move the affected structures through a full range of movement every hour.



## MODULE THIRTEEN

### SUBGROUPS OF OTHER

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

1. Discuss the criteria of the subgroups of OTHER in the Lower Extremities and analyse how the subgroups would present during a MDT assessment.
2. Discuss the management of each subgroup by what is currently supported in the literature and analyse how this fits with MDT principles and strategies.



**Objective 1: Discuss the criteria of the subgroups of OTHER in the Lower Extremities and analyse how the subgroups would present during a MDT assessment.**

### **McKenzie Classification: Extremity OTHER**

<b>Serious Pathology (list is not exhaustive)</b>			
<b>Category</b>	<b>Clinical Findings (Red Flags)</b>		<b>Clinical Examples</b>
Cancer	Age >55, <b>history of cancer</b> , unexplained weight loss, progressive, not relieved by rest		May be primary site or metastases
Fracture	History of significant trauma (if osteoporosis present; minor trauma) Loss of function. All movements make worse.		
Infection	Fever, malaise, constant pain, all movements worsen		

<b>Subgroup</b>	<b>Definition</b>	<b>Criteria</b>	<b>Clinical Examples</b>
<b>Chronic Pain Syndrome</b>	Pain-generating mechanism influenced by psychosocial factors or neurophysiological changes	Persistent widespread pain, aggravation with all activity, disproportionate pain response to mechanical stimuli, inappropriate beliefs and attitudes about pain.	Regional pain syndromes
<b>Inflammatory</b>	Inflammatory arthropathy	Constant pain, morning stiffness, excessive movements exacerbate symptoms	RA, sero-negative arthritis, some stages of OA
<b>Mechanically Inconclusive</b>	Unknown musculoskeletal pathology	Derangement, Dysfunction, Postural and subgroups of OTHER excluded Symptoms affected by positions or movements BUT no recognisable pattern identified Or inconsistent symptomatic and mechanical responses on loading	
<b>Peripheral Nerve Entrapment</b>	Peripheral nerve entrapment	No spinal symptoms. Local paraesthesia / anaesthesia. May have local muscle weakness.	Carpal tunnel syndrome, meralgia paraesthetica
<b>Post-surgery</b>	Presentation relates to recent surgery	Recent surgery and still in post-operative protocol period	
<b>Soft Tissue Disease Process</b>	A fibroblastic or degenerative disease process affecting inert soft tissue with unknown or disputed aetiology	Each disease process has a unique clinical presentation, natural history and response to a variety of interventions.	Frozen shoulder, Dupuytren's, plantar fascia syndrome
<b>Structurally Compromised</b>	Soft tissue and/or bony changes compromising joint integrity	Mechanical symptoms (ROM restricted, clunking, locking, catching). May have sensation of instability. Long history of symptoms or history of trauma. Irreversible with conservative care.	Late stage OA, dislocation, labral tear, cruciate ligament rupture, irreducible meniscal tear
<b>Trauma / Recovering Trauma</b>	Recent trauma associated with onset of symptoms	Recent trauma associated with onset of constant symptoms / recent trauma associated with onset of symptoms, now improving and pain intermittent	
<b>Vascular</b>	Symptoms induced by poor blood supply due to pressure increase in a closed anatomical space	Below knee symptoms, predominantly in younger athletes. Consistently induced by exercise or activity. May have pain and /or paraesthesia in field of local cutaneous nerve and local swelling.	Compartment syndrome



**Objective 2: Discuss the management of each subgroup by what is currently supported in the literature and analyse how this fits with MDT principles and strategies.**

Extremity OTHER Subgroups	Management: Integrating MDT Principals and the Evidence
<b>Serious Pathology</b>	Refer to / communicate directly with medical provider or emergency depending on the nature of the problem
<b>Chronic Pain Syndrome</b>	Education about the nature of chronic pain and graded exposure/CBT using the produce / increase / NW principle. Encourage self-treatment, and perform active assessment (repeated movements) to help address any fear avoidance. Additionally, any evidence based active interventions aimed at modulating central processing including multi-disciplinary management.
<b>Inflammatory</b>	Refer to appropriate medical provider for medical management if source unknown. If source known, then education and guidance regarding the evidence based self-management of the particular systemic disease is warranted.
<b>Mechanically Inconclusive</b>	Using information of aggravating factors from MDT history, avoidance of aggravating Movements / positions, create the ideal environment for recovery. Address functional deficits and physical impairments using concepts of self-management, produce / increase NW, symptom interpretation and education. If unresponsive, refer to appropriate medical provider.
<b>Peripheral Nerve Entrapment</b>	Using information of aggravating factors from MDT history, avoidance of aggravating Movements / positions. Other activities encouraged with produce / increase / NW principle. Other interventions supported by the evidence could be considered.
<b>Post-Surgery</b>	Follow post-surgical protocols; if recovery as per expected timeline, continue rehab as normal focusing on independence, education, progression of forces and produce/increase NW principle. If recovery is poorer than expected then reassess classification and treat as assessment dictates.
<b>Soft Tissue Disease Process</b>	Each managed according to the best evidence available. Education regarding natural history. Any intervention guided by MDT principles of produce/increase NW and self-management.
<b>Structurally Compromised</b>	Determine if further medical input is needed. If not, identify functional deficits and physical impairments and address using MDT concepts of produce/ increase / NW and evidence based treatment when available.
<b>Trauma / Recovering Trauma</b>	Follow stages of recovery, provide appropriate loading strategies, produce/ increase NW, progression of forces, posture education, self-management. If recovery is poorer than expected then reassess classification and treat as assessment dictates.
<b>Vascular</b>	Managed according to best evidence available; primarily short-term modification or avoidance of aggravating activity.

## Notes

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## MODULE FOURTEEN:

### CASE STUDIES

#### **OBJECTIVES**

**With sufficient time, participants will be able to meet/achieve the following objectives to:**

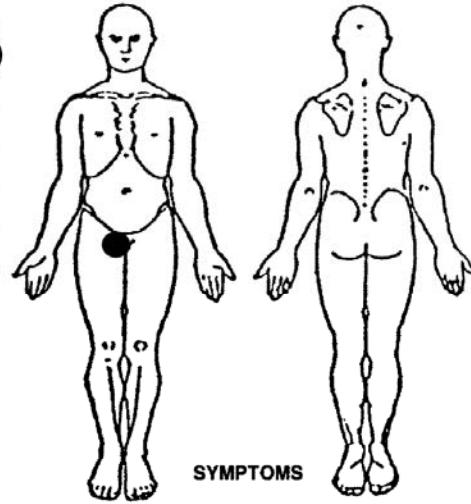
1. Analyse case studies presented on McKenzie Assessment forms and using MDT clinical reasoning principles determine the presence of Derangement, Dysfunction or Postural Syndrome.
2. Analyse case studies presented on McKenzie Assessment forms, and using clinical reasoning differentiate the presence of serious pathology.
3. Analyse case studies presented on McKenzie Assessment forms, and using clinical reasoning differentiate the presence of OTHER subgroups.
4. Analyse the findings of the assessment forms and using MDT clinical reasoning, design a management plan for the provisional classification.





## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name Doreen Sex M F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 33  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Clerical  
Leisure: Mechanical stresses Running, bike riding  
Functional disability from present episode Running, Bike riding  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) 4



### HISTORY

Present symptoms Right groin pain  
Present since 8 weeks Improving Unchanging Worsening  
Commenced as a result of Running and felt pain Or No Apparent Reason  
Symptoms at onset Right groin pain Paraesthesia: Yes No  
Spinal history Episodic LBP TX successfully with certified manipulative therapist Cough / Sneeze +ve -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: Right groin pain

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other Running, Lunge  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes No  
Pain at rest Yes No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Squat = NE  
Previous episodes Nil groin pain, previous LBP as above

Previous treatments \_\_\_\_\_

General health Good Fair / Poor \_\_\_\_\_

Medications: Nil NSAIDS / Analg / Steroids / Anticoag / Other Muscle Relaxants

Imaging: Yes / No MRI – L4-5 Right Post-lat protusion

Recent or major surgery: Yes No Night pain: Yes No

Accidents: Yes No Unexplained weight loss: Yes No

**Summary** Acute / Sub-acute / Chronic Trauma Insidious Onset

Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: SI Joint

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## EXAMINATION

### POSTURE

Sitting Good / Fair **Poor** Correction of Posture: Better / **Worse** / No Effect / NA Standing: Good / **Fair** / Poor  
Other observations: **Some asymmetry – High Right Hip, Low L Shoulder**

NEUROLOGICAL: **NA** Motor / Sensory / Reflexes / Dural

BASELINES (pain or functional activity): **0/10. Squat = NE, Lunge produces groin pain**

EXTREMITIES **Hip** Knee / Ankle / Foot

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion				X	ERP
Extension				X	
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion				X	
Abduction / Eversion				X	
Internal Rotation				X	
External Rotation				X	

Passive Movement (+/- over pressure) (note symptoms and range):	PDM	ERP
Nil limitations all arcs		
Flex w/OP		X

Resisted Test Response (pain) \_\_\_\_\_  
NE all arcs \_\_\_\_\_  
Other Tests \_\_\_\_\_  
SIJ – 5 Laslett Pain Provocation Tests = NE

### SPINE

Movement Loss **Flex: mod loss; Ext: major loss; R SG: mod loss; L SG: min loss**  
Rep Flex: Incr / Worse; Rep Ext: Incr / W; R SGIS: Produce LBP,  
Effect of repeated movements **Abolish Groin Pain/ B (Also Incr ROM in Flex, Ext and R SG)**  
Effect of static positioning \_\_\_\_\_  
Spine testing *Not relevant* **Relevant** Secondary problem \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Active Flexion	P	NW		X
Passive Flexion w/OP	P	NW		X
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
Other \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

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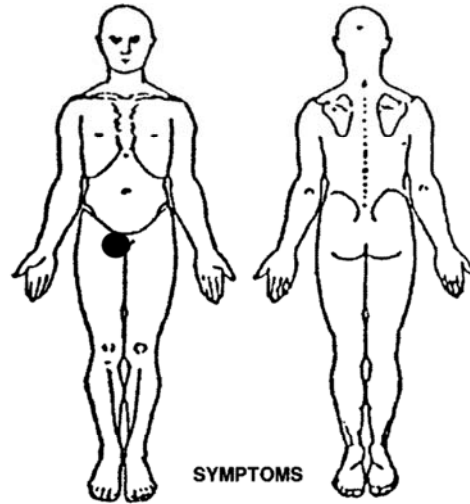






## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name Colin Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 33  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Teacher  
Leisure: Mechanical stresses Running, Bike riding  
Functional disability from present episode Cannot run / walk  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) 4



### HISTORY

Present symptoms Right groin pain  
Present since 6 weeks Improving Unchanging / Worsening  
Commenced as a result of Running and felt right groin pain Or No Apparent Reason  
Paraesthesia: Yes / No  
Cough / Sneeze +ve / -ve  
Spinal history \_\_\_\_\_  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: Right groin pain

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other Walking / running  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes Last year  
Previous treatments Self limited after week of stopping running  
General health Good / Fair / Poor  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No  
Recent or major surgery: Yes / No Night pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting: Good / **Fair** / Poor Correction of Posture: Better / Worse / **No Effect** / NA Standing: Good / **Fair** / Poor  
Other observations: \_\_\_\_\_

NEUROLOGICAL: **NA** Motor / Sensory / Reflexes / Dural \_\_\_\_\_

BASELINES (pain or functional activity): 0/10 pain, run / walk / lunge + \_\_\_\_\_

EXTREMITIES **Hip** / Knee / Ankle / Foot

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion				X	
Extension				X	
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion				X	
Abduction / Eversion				X	
Internal Rotation				X	ERP
External Rotation				X	ERP

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

Full/free – Flex, Ext, IR, Adduction

ER w/OP

Abduction

Resisted Test Response (pain) Flex – NE; Ext – NE; ER – NE

IR – 5-/5 and painful; Adduction 3/5 and painful

Other Tests \_\_\_\_\_

SIJ – Laslett tests – NE

### SPINE

Movement Loss Nil loss

Effect of repeated movements SGIS (R) P/NW

Effect of static positioning

Spine testing **Not relevant** / Relevant / Secondary problem \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Adduction – Resisted	P	NW		X
IR – Resisted	P	NW		X
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular \_\_\_\_\_

Contractile \_\_\_\_\_

Derangement \_\_\_\_\_

Postural \_\_\_\_\_

Other \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_

Equipment Provided \_\_\_\_\_

Exercise and Dosage \_\_\_\_\_

Barriers to recovery \_\_\_\_\_

Treatment Goals \_\_\_\_\_



### Case Study Worksheet

History	Name:	Name:
Site of symptoms		
Functional Limitations		
Present symptoms		
Duration of symptoms		
Improving / Unchanging/ Worsening		
Commenced as a result of		
Spinal History		
Constant / Intermittent		
What produces or worsens		
What stops or reduces		
Pain at rest		
Disturbed sleep		
General Health issues		
Acute / Sub-Acute / Chronic		
Trauma/ Insidious onset		
Provisional Classification		





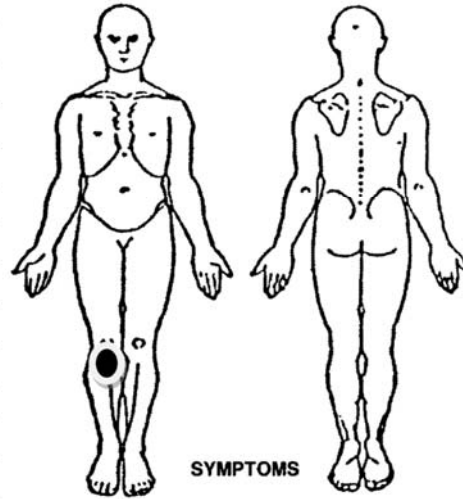
Physical Examination	Name:	Name:
Observation		
Baseline function		
Active Range of Motion		
Passive Movements		
Resisted Movements		
Spine Testing		
Repeated Movements (spine or extremity)		
Provisional Classification		
Prognosis		
Management Strategies		





## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name David Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 28  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Carpenter  
**Stresses – all positions, climbs, builds houses**  
Leisure: Mechanical stresses Golf, softball, hiking  
Functional disability from present episode Can't golf, bike, etc.  
Functional disability score Self rated 20% disability  
VAS Score (0-10) 6/10



### HISTORY

Present symptoms Anterior knee pain  
Present since 10 weeks Improving / Unchanging Worsening  
Commenced as a result of Insidious onset Or No Apparent Reason  
Symptoms at onset Right knee Paraesthesia: Yes / No  
Spinal history Back problems – better on its own, short duration Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: Anterior knee

**Worse** ~~bending~~ ~~sitting / rising / first few steps~~ standing walking stairs squatting / kneeling  
~~am / as the day progresses / pm~~ when still / on the move Sleeping: prone / sup / side R / L  
Other Climbing down > up, riding bike, ramps, downhill walking, down stairs  
**Better** ~~bending~~ sitting standing ~~walking~~ ~~stairs~~ squatting / kneeling  
~~am / as the day progresses / pm~~ when still on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: ~~Swelling~~ ~~Clicking / Locking~~ ~~Giving Way / Falling~~

Previous episodes None  
Previous treatments None  
General health Good / Fair / Poor  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other Eases pain  
Imaging: Yes / No  
Recent or major surgery: Yes / No Night pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No

**Summary** Acute / Sub-acute Chronic Trauma Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting: **Good** / Fair / Poor Correction of Posture: Better / Worse / **No Effect** / NA Standing: **Good** / Fair / Poor  
Other observations: **No abnormalities noted**

NEUROLOGICAL: **NA** / Motor / Sensory / Reflexes / Dural

BASELINES (pain or functional activity): **Walking down ramp, down steps**

EXTREMITIES Hip **Knee** / Ankle / Foot

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion				<b>X</b>	<b>PDM</b>
Extension				<b>X</b>	<b>PDM</b>
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range):	PDM	ERP
Flexion - NE		
Extension - NE		

Resisted Test Response (pain) **Resisted Flexion – Anterior knee pain**  
**Extension – Anterior knee pain - PDM**

Other Tests

### SPINE

Movement Loss **N/A**  
Effect of repeated movements  
Effect of static positioning  
Spine testing **Not relevant / Relevant / Secondary problem**

Baseline Symptoms **None**

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Flexion	<b>P (ERP)</b>			
Repeated Flexion	<b>P (ERP)</b>	<b>NW</b>		<b>X</b>
Extension	<b>P, PDM</b>			
Repeated Extension	<b>P, PDM</b>	<b>NW</b>		<b>X</b>
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular  
Derangement  
Other

Contractile  
Postural

### PRINCIPLE OF MANAGEMENT

Education  
Exercise and Dosage  
Barriers to recovery  
Treatment Goals

Equipment Provided

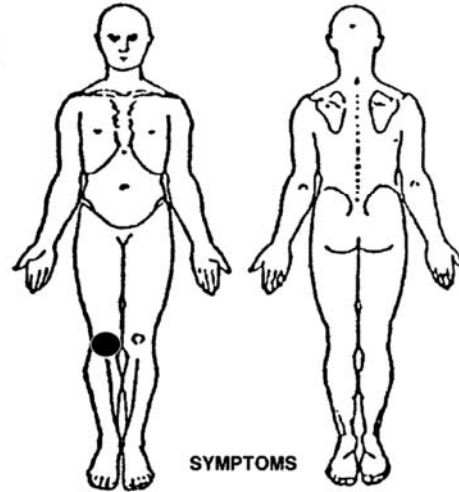
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## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name Sandy Sex M F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 40  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Secretary  
Sits – 80% of the day  
Leisure: Mechanical stresses Gym (3 x week), walks her dog  
Functional disability from present episode Walking dog limited  
Functional disability score Self rated 20% disability  
VAS Score (0-10) 4/10



### HISTORY

Present symptoms Anterior knee pain  
Present since 10 weeks Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset Knee Paraesthesia: Yes / No  
Spinal history Back problems – better on its own, short duration Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: ☒

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Sitting, walking fast, extending knee, keeping knee bent for long periods.  
Other Walking fast – noticeable limp right leg

**Better** bending sitting standing Walking slow stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other Walking slow, lying down and resting

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes None  
Previous treatments None  
General health Good / Fair / Poor  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other NE  
Imaging: Yes / No  
Recent or major surgery: Yes / No Night pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No

**Summary** Acute / Sub-acute Chronic Trauma Insidious Onset  
Sites for physical examination Back / Hip Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect* **NA** Standing: *Good / Fair / Poor*  
Other observations: **Right Knee. No abnormalities noted.**

### NEUROLOGICAL:

**NA**

/ Motor / Sensory / Reflexes / Dural

**BASELINES** (pain or functional activity): **Walking fast**

### EXTREMITIES

Hip **Knee** / Ankle / Foot

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion				<b>X</b>	<b>PDM</b>
Extension				<b>X</b>	<b>PDM</b>
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

**Passive Movement** (+/- over pressure) (note symptoms and range):

**PDM ERP**

**Flexion - NE**

**Extension with OP – Produce Pain, NE ROM**

**X**

**Resisted Test Response** (pain) **Flexion – 5/5, No pain**

**Extension – 4/5 Increased Pain - PDM**

**Other Tests**

### SPINE

Movement Loss **N/A**

Effect of repeated movements

Effect of static positioning

Spine testing *Not relevant / Relevant / Secondary problem*

**Baseline Symptoms** **None**

Repeated Tests	Symptom Response		Mechanical Response	
<b>Active</b> Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
<b>Flexion</b>	<b>P</b>	<b>NW</b>		
<b>Repeated Flexion</b>	<b>P</b>	<b>W</b>	<b>↓ - Ext</b>	
<b>Extension</b>	<b>Increases</b>	<b>NW</b>		<b>X</b>
<b>Repeated Extension</b>	<b>Decreases</b>	<b>B</b>	<b>↑</b>	
<b>Effect of static positioning</b>				
<b>Extension with OP</b>	<b>Decrease, A</b>	<b>B</b> (less noticeable limp)	<b>↑</b>	

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular

Contractile

Derangement

Postural

Other

### PRINCIPLE OF MANAGEMENT

Education

Equipment Provided

Exercise and Dosage

Barriers to recovery

Treatment Goals



### Case Study Worksheet

History	Name:	Name:
Site of symptoms		
Functional Limitations		
Present symptoms		
Duration of symptoms		
Improving / Unchanging/ Worsening		
Commenced as a result of		
Spinal History		
Constant / Intermittent		
What produces or worsens		
What stops or reduces		
Pain at rest		
Disturbed sleep		
General Health issues		
Acute / Sub-Acute / Chronic		
Trauma/ Insidious onset		
Provisional Classification		





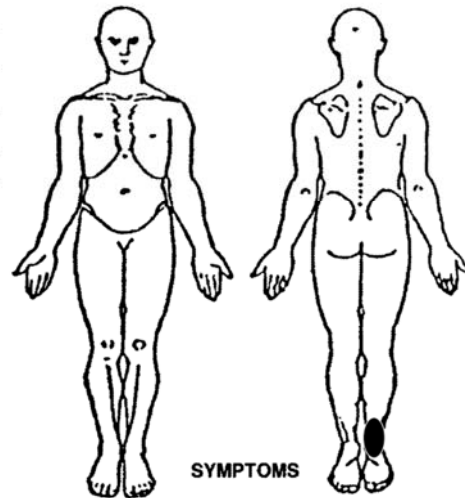
Physical Examination	Name:	Name:
Observation		
Baseline function		
Active Range of Motion		
Passive Movements		
Resisted Movements		
Spine Testing		
Repeated Movements (spine or extremity)		
Provisional Classification		
Prognosis		
Management Strategies		





## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name Bill Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 42  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Banker  
**Sitting**  
Leisure: Mechanical stresses Basketball, Hiking  
Functional disability from present episode Basketball, Hiking  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) 2



### HISTORY

Present symptoms As body diagram  
Present since 6 Months Improving / Unchanging Worsening  
Commenced as a result of Playing basketball Or No Apparent Reason  
Symptoms at onset Heel Paraesthesia: Yes No  
Spinal history None Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: Heel

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other Basketball, Prolonged walking, First few steps after resting  
**Better** bending sitting standing Walking stairs squatting / kneeling  
am / as the day progresses / pm when still on the move Sleeping: prone / sup / side R / L  
other Rest

Continued use makes the pain: Better Worse No Effect Disturbed night Yes No  
Pain at rest Yes / No Occasionally following activity Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes 2 previous episodes resolving in 2-3 weeks  
Previous treatments None  
General health Good / Fair / Poor  
Medications: Nil NSAIDS / Analg / Steroids / Anticoag / Other  
Imaging: Yes / No X-rays - Normal  
Recent or major surgery: Yes / No Night pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No

**Summary** Acute / Sub-acute Chronic Trauma Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect* **NA** Standing: *Good / Fair / Poor*  
Other observations: **Foot / Ankle. No abnormality observed.**

NEUROLOGICAL: **NA** Motor / Sensory / Reflexes / Dural

BASELINES (pain or functional activity): **Pain going up on tip-toes**

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion			<b>X</b>		<b>Heel</b>
Plantar Flexion				<b>X</b>	

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion			<b>X</b>		<b>Heel</b>
Abduction / Eversion			<b>X</b>		<b>Heel</b>
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range):	PDM	ERP
<b>Decreased dorsiflexion</b>		<b>X</b>

Resisted Test Response (pain) **Pain with PF**

Other Tests

### SPINE

Movement Loss **Lumbar movements all full range and painless**

Effect of repeated movements **Not tested**

Effect of static positioning **Not tested**

Spine testing **Not relevant** Relevant / Secondary problem

Baseline Symptoms **None**

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Rep PF (Active)	<b>Increase</b>	<b>W</b>	<b>↓</b>	
REP DF (Active + OP)	<b>Decrease</b>	<b>B</b>	<b>↑</b>	
REP DF (LOADED)	<b>Abolish</b>	<b>B</b>	<b>↑</b>	
Effect of static positioning	<b>Not tested</b>			

### PROVISIONAL CLASSIFICATION

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
Other \_\_\_\_\_

### Extremities

### Spine

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

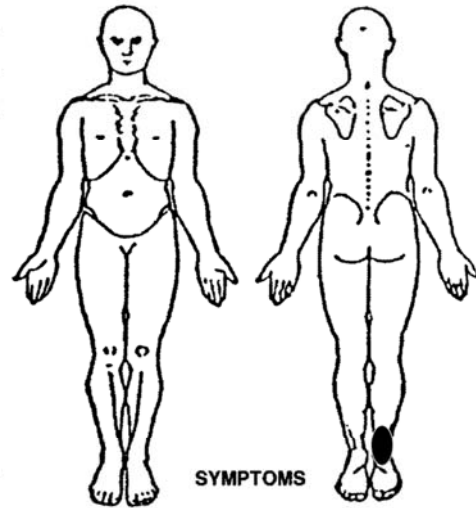
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## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name Bob Sex M ☐ F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age 40  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses Accountant  
**Sitting** \_\_\_\_\_  
Leisure: Mechanical stresses Golf, Basketball, Walking  
Functional disability from present episode Basketball  
\_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) 2



### HISTORY

Present symptoms As body diagram  
Present since 6 Months Improving / Unchanging / Worsening  
Commenced as a result of Playing basketball Or No Apparent Reason  
Symptoms at onset Heel Paraesthesia: Yes / No  
Spinal history None Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: Heel

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other Basketball, Prolonged walking, Up on tip toes  
**Better** bending sitting standing Walking stairs squatting / kneeling  
am / as the day progresses / pm when still on the move Sleeping: prone / sup / side R / L  
other Rest

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes None  
Previous treatments None  
General health Good / Fair / Poor  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other No effect  
Imaging: Yes / No X-rays = Normal  
Recent or major surgery: Yes / No Night pain: Yes / No  
Accidents: Yes / No Unexplained weight loss: Yes / No

**Summary** Acute / Sub-acute Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURE

Sitting Good / Fair / Poor Correction of Posture: Better / Worse / No Effect **NA** Standing: Good / Fair / Poor  
Other observations: Foot / Ankle. No abnormality observed.

NEUROLOGICAL: **NA** / Motor / Sensory / Reflexes / Dural \_\_\_\_\_

BASELINES (pain or functional activity): Pain going up on tip-toes

EXTREMITIES Hip / Knee / Ankle / Foot

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion			X		Heel
Plantar Flexion				X	Heel

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion				X	Heel
Abduction / Eversion				X	Heel
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

Slight loss ERP

PDM	ERP
	X

Resisted Test Response (pain) Plantar flexion painful and weak (4/5)

Other Tests \_\_\_\_\_

### SPINE

Movement Loss Lumbar movements all full range and painless

Effect of repeated movements Not tested

Effect of static positioning Not tested

Spine testing **Not relevant** / Relevant / Secondary problem \_\_\_\_\_

Baseline Symptoms None

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Dorsiflexion (Active +op)	P ERP	NW		X
PF (Active/Passive +/- OP)	NE	NE		X
PF resisted	P PDM	NW		X
Effect of static positioning	Not tested			

### PROVISIONAL CLASSIFICATION

Dysfunction – Articular \_\_\_\_\_

Derangement \_\_\_\_\_

Other \_\_\_\_\_

### Extremities

### Spine

Contractile \_\_\_\_\_

Postural \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_

Equipment Provided \_\_\_\_\_

Exercise and Dosage \_\_\_\_\_

Barriers to recovery \_\_\_\_\_

Treatment Goals \_\_\_\_\_



### Case Study Worksheet

History	Name:	Name:
Site of symptoms		
Functional Limitations		
Present symptoms		
Duration of symptoms		
Improving / Unchanging/ Worsening		
Commenced as a result of		
Spinal History		
Constant / Intermittent		
What produces or worsens		
What stops or reduces		
Pain at rest		
Disturbed sleep		
General Health issues		
Acute / Sub-Acute / Chronic		
Trauma/ Insidious onset		
Provisional Classification		



Physical Examination	Name:	Name:
Observation		
Baseline function		
Active Range of Motion		
Passive Movements		
Resisted Movements		
Spine Testing		
Repeated Movements (spine or extremity)		
Provisional Classification		
Prognosis		
Management Strategies		



# APPENDIX 1:

## ASSESSMENT FORMS



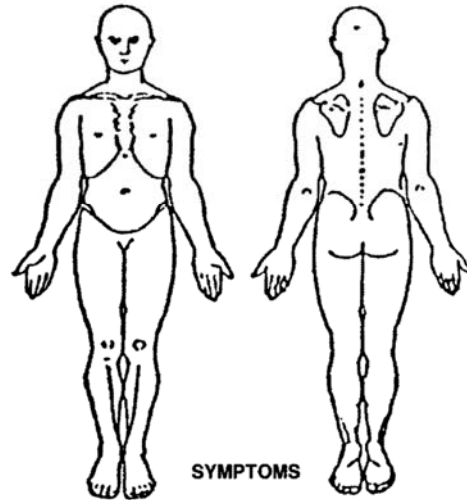
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## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ improving / unchanging / worsening  
Commenced as a result of \_\_\_\_\_ or no apparent reason  
Symptoms at onset: back / thigh / leg \_\_\_\_\_  
Constant symptoms: back / thigh / leg \_\_\_\_\_ Intermittent symptoms: back / thigh / leg \_\_\_\_\_  
Worse bending sitting / rising standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Better bending sitting standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed sleep yes / no Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous episodes 0 1-5 6-10 11+ Year of first episode \_\_\_\_\_  
Previous history \_\_\_\_\_  
Previous treatments \_\_\_\_\_

### SPECIFIC QUESTIONS

Cough / sneeze / strain / +ve / -ve Bladder/Bowel: normal / abnormal Gait: normal / abnormal  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General health: good / fair / poor \_\_\_\_\_  
Imaging: yes / no \_\_\_\_\_  
Recent or major surgery: yes / no \_\_\_\_\_ Night pain: yes / no \_\_\_\_\_  
Accidents: yes / no \_\_\_\_\_ Unexplained weight loss: yes / no \_\_\_\_\_  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting: *good / fair / poor*    Standing: *good / fair / poor*    Lordosis: *red / acc / normal*    Lateral shift: *right / left / nil*  
Correction of posture: *better / worse / no effect*    Relevant: *yes / no*  
Other observations: \_\_\_\_\_

### NEUROLOGICAL

Motor deficit \_\_\_\_\_ Reflexes \_\_\_\_\_  
Sensory deficit \_\_\_\_\_ Dural signs \_\_\_\_\_

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Side gliding R					
Side gliding L					

**TEST MOVEMENTS** Describe effect on present pain – **During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising. **After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms during testing	Symptoms after testing	Mechanical response		
			↑Rom	↓Rom	No effect
<b>Pretest symptoms standing</b>					
FIS					
Rep FIS					
EIS					
Rep EIS					
<b>Pretest symptoms lying</b>					
FIL					
Rep FIL					
EIL					
Rep EIL					
<b>If required pretest symptoms</b>					
SGIS - R					
Rep SGIS - R					
SGIS - L					
Rep SGIS - L					

### STATIC TESTS

Sitting slouched \_\_\_\_\_ Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement                      Dysfunction                      Postural                      OTHER  
Central or Symmetrical              Unilateral or Asymmetrical above knee              Unilateral or Asymmetrical below knee

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment provided \_\_\_\_\_  
Extension principle \_\_\_\_\_ Lateral principle \_\_\_\_\_  
Flexion principle \_\_\_\_\_ Other \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment goal \_\_\_\_\_

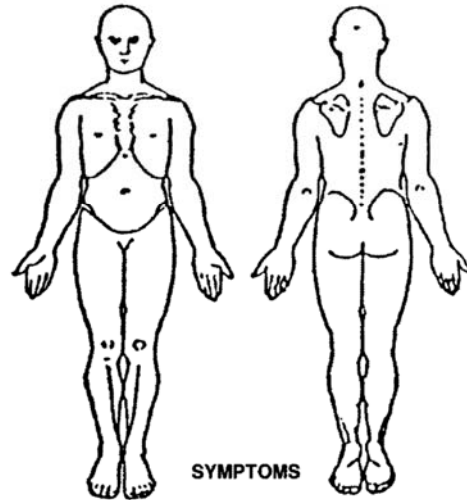
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## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ improving / unchanging / worsening  
Commenced as a result of \_\_\_\_\_ or no apparent reason  
Symptoms at onset: back / thigh / leg \_\_\_\_\_  
Constant symptoms: back / thigh / leg \_\_\_\_\_ Intermittent symptoms: back / thigh / leg \_\_\_\_\_  
Worse bending sitting / rising standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Better bending sitting standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed sleep yes / no Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous episodes 0 1-5 6-10 11+ Year of first episode \_\_\_\_\_  
Previous history \_\_\_\_\_  
Previous treatments \_\_\_\_\_

### SPECIFIC QUESTIONS

Cough / sneeze / strain / +ve / -ve Bladder/Bowel: normal / abnormal Gait: normal / abnormal  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General health: good / fair / poor \_\_\_\_\_  
Imaging: yes / no \_\_\_\_\_  
Recent or major surgery: yes / no \_\_\_\_\_ Night pain: yes / no \_\_\_\_\_  
Accidents: yes / no \_\_\_\_\_ Unexplained weight loss: yes / no \_\_\_\_\_  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting: *good / fair / poor*    Standing: *good / fair / poor*    Lordosis: *red / acc / normal*    Lateral shift: *right / left / nil*  
Correction of posture: *better / worse / no effect*    Relevant: *yes / no*  
Other observations: \_\_\_\_\_

### NEUROLOGICAL

Motor deficit \_\_\_\_\_ Reflexes \_\_\_\_\_  
Sensory deficit \_\_\_\_\_ Dural signs \_\_\_\_\_

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Side gliding R					
Side gliding L					

**TEST MOVEMENTS**    Describe effect on present pain – **During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising. **After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms during testing	Symptoms after testing	Mechanical response		
			↑Rom	↓Rom	No effect
<b>Pretest symptoms standing</b>					
FIS					
Rep FIS					
EIS					
Rep EIS					
<b>Pretest symptoms lying</b>					
FIL					
Rep FIL					
EIL					
Rep EIL					
<b>If required pretest symptoms</b>					
SGIS - R					
Rep SGIS - R					
SGIS - L					
Rep SGIS - L					

### STATIC TESTS

Sitting slouched \_\_\_\_\_ Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement    Dysfunction    Postural    OTHER  
Central or Symmetrical    Unilateral or Asymmetrical above knee    Unilateral or Asymmetrical below knee

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment provided \_\_\_\_\_  
Extension principle \_\_\_\_\_ Lateral principle \_\_\_\_\_  
Flexion principle \_\_\_\_\_ Other \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment goal \_\_\_\_\_

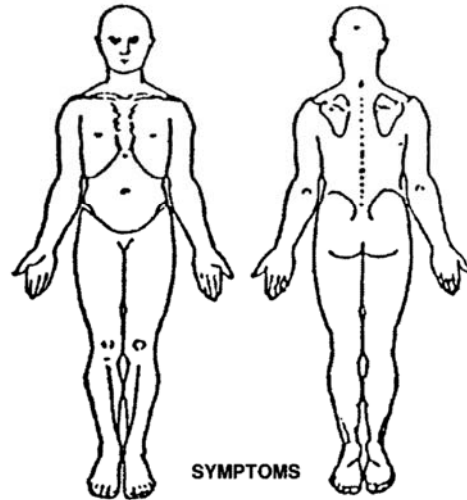
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## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ improving / unchanging / worsening  
Commenced as a result of \_\_\_\_\_ or no apparent reason  
Symptoms at onset: back / thigh / leg \_\_\_\_\_  
Constant symptoms: back / thigh / leg \_\_\_\_\_ Intermittent symptoms: back / thigh / leg \_\_\_\_\_  
Worse bending sitting / rising standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Better bending sitting standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed sleep yes / no Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous episodes 0 1-5 6-10 11+ Year of first episode \_\_\_\_\_  
Previous history \_\_\_\_\_  
Previous treatments \_\_\_\_\_

### SPECIFIC QUESTIONS

Cough / sneeze / strain / +ve / -ve Bladder/Bowel: normal / abnormal Gait: normal / abnormal  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General health: good / fair / poor \_\_\_\_\_  
Imaging: yes / no \_\_\_\_\_  
Recent or major surgery: yes / no \_\_\_\_\_ Night pain: yes / no \_\_\_\_\_  
Accidents: yes / no \_\_\_\_\_ Unexplained weight loss: yes / no \_\_\_\_\_  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting: *good / fair / poor*    Standing: *good / fair / poor*    Lordosis: *red / acc / normal*    Lateral shift: *right / left / nil*  
Correction of posture: *better / worse / no effect*    Relevant: *yes / no*  
Other observations: \_\_\_\_\_

### NEUROLOGICAL

Motor deficit \_\_\_\_\_ Reflexes \_\_\_\_\_  
Sensory deficit \_\_\_\_\_ Dural signs \_\_\_\_\_

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Side gliding R					
Side gliding L					

**TEST MOVEMENTS** Describe effect on present pain – **During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising. **After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms during testing	Symptoms after testing	Mechanical response		
			↑Rom	↓Rom	No effect
<b>Pretest symptoms standing</b>					
FIS					
Rep FIS					
EIS					
Rep EIS					
<b>Pretest symptoms lying</b>					
FIL					
Rep FIL					
EIL					
Rep EIL					
<b>If required pretest symptoms</b>					
SGIS - R					
Rep SGIS - R					
SGIS - L					
Rep SGIS - L					

### STATIC TESTS

Sitting slouched \_\_\_\_\_ Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement                      Dysfunction                      Postural                      OTHER  
Central or Symmetrical                      Unilateral or Asymmetrical above knee                      Unilateral or Asymmetrical below knee

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment provided \_\_\_\_\_  
Extension principle \_\_\_\_\_ Lateral principle \_\_\_\_\_  
Flexion principle \_\_\_\_\_ Other \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment goal \_\_\_\_\_

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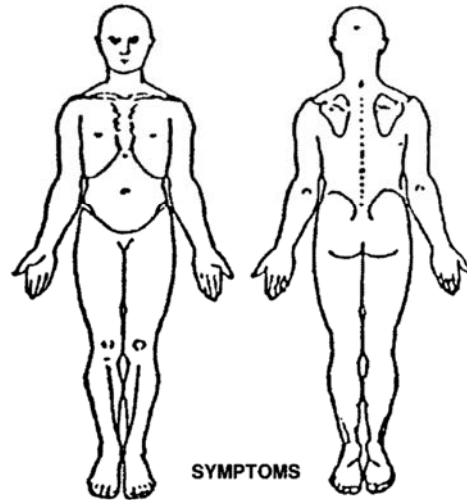






## THE MCKENZIE INSTITUTE LUMBAR SPINE ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ improving / unchanging / worsening  
Commenced as a result of \_\_\_\_\_ or no apparent reason  
Symptoms at onset: back / thigh / leg \_\_\_\_\_  
Constant symptoms: back / thigh / leg \_\_\_\_\_ Intermittent symptoms: back / thigh / leg \_\_\_\_\_  
Worse bending sitting / rising standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Better bending sitting standing walking lying  
am / as the day progresses / pm when still / on the move  
other \_\_\_\_\_  
Disturbed sleep yes / no Sleeping postures: prone / sup / side R / L Surface: firm / soft / sag  
Previous episodes 0 1-5 6-10 11+ Year of first episode \_\_\_\_\_  
Previous history \_\_\_\_\_  
Previous treatments \_\_\_\_\_

### SPECIFIC QUESTIONS

Cough / sneeze / strain / +ve / -ve Bladder/Bowel: normal / abnormal Gait: normal / abnormal  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
General health: good / fair / poor \_\_\_\_\_  
Imaging: yes / no \_\_\_\_\_  
Recent or major surgery: yes / no \_\_\_\_\_ Night pain: yes / no \_\_\_\_\_  
Accidents: yes / no \_\_\_\_\_ Unexplained weight loss: yes / no \_\_\_\_\_  
Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting: *good / fair / poor*      Standing: *good / fair / poor*      Lordosis: *red / acc / normal*      Lateral shift: *right / left / nil*  
Correction of posture: *better / worse / no effect*      Relevant: *yes / no*  
Other observations: \_\_\_\_\_

### NEUROLOGICAL

Motor deficit \_\_\_\_\_ Reflexes \_\_\_\_\_  
Sensory deficit \_\_\_\_\_ Dural signs \_\_\_\_\_

### MOVEMENT LOSS

	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Side gliding R					
Side gliding L					

**TEST MOVEMENTS** Describe effect on present pain – **During:** produces, abolishes, increases, decreases, no effect, centralising, peripheralising. **After:** better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms during testing	Symptoms after testing	Mechanical response		
			↑Rom	↓Rom	No effect
<b>Pretest symptoms standing</b>					
FIS					
Rep FIS					
EIS					
Rep EIS					
<b>Pretest symptoms lying</b>					
FIL					
Rep FIL					
EIL					
Rep EIL					
<b>If required pretest symptoms</b>					
SGIS - R					
Rep SGIS - R					
SGIS - L					
Rep SGIS - L					

### STATIC TESTS

Sitting slouched \_\_\_\_\_ Sitting erect \_\_\_\_\_  
Standing slouched \_\_\_\_\_ Standing erect \_\_\_\_\_  
Lying prone in extension \_\_\_\_\_ Long sitting \_\_\_\_\_

### OTHER TESTS

### PROVISIONAL CLASSIFICATION

Derangement      Dysfunction      Postural      OTHER  
Central or Symmetrical      Unilateral or Asymmetrical above knee      Unilateral or Asymmetrical below knee

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment provided \_\_\_\_\_  
Extension principle \_\_\_\_\_ Lateral principle \_\_\_\_\_  
Flexion principle \_\_\_\_\_ Other \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment goal \_\_\_\_\_

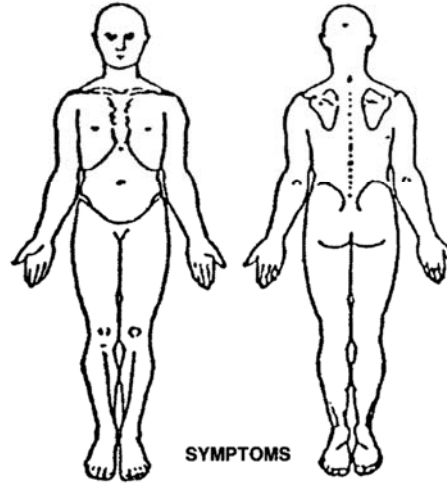
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## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex \_\_\_\_\_ M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse**      bending      sitting / rising / first few steps      standing      walking      stairs      squatting / kneeling  
am / as the day progresses / pm      when still / on the move      Sleeping: prone / sup / side R / L  
Other \_\_\_\_\_  
**Better**      bending      sitting      standing      walking      stairs      squatting / kneeling  
am / as the day progresses / pm      when still / on the move      Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain:      Better      Worse      No Effect      Disturbed night      Yes / No  
Pain at rest      Yes / No      Site:      Back / Hip / Knee / Ankle / Foot  
Other Questions:      Swelling      Clicking / Locking      Giving Way / Falling

Previous episodes \_\_\_\_\_  
Previous treatments \_\_\_\_\_  
General health: Good / Fair / Poor \_\_\_\_\_  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No \_\_\_\_\_  
Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary**      Acute / Sub-acute / Chronic      Trauma / Insidious Onset  
Sites for physical examination      Back / Hip / Knee / Ankle / Foot      Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect / NA* Standing: *Good / Fair / Poor*  
Other observations: \_\_\_\_\_

NEUROLOGICAL: *NA / Motor / Sensory / Reflexes / Dural* \_\_\_\_\_

BASELINES (pain or functional activity): \_\_\_\_\_

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

PDM ERP

Resisted Test Response (pain) \_\_\_\_\_

Other Tests \_\_\_\_\_

### SPINE

Movement Loss \_\_\_\_\_  
Effect of repeated movements \_\_\_\_\_  
Effect of static positioning \_\_\_\_\_  
Spine testing *Not relevant / Relevant / Secondary problem* \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

Extremities

Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
OTHER \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

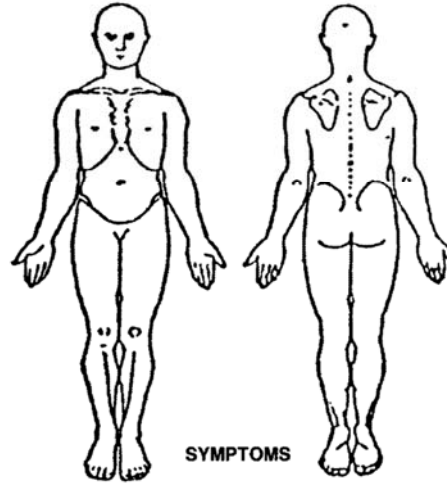
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## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other \_\_\_\_\_  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes \_\_\_\_\_  
Previous treatments \_\_\_\_\_  
General health: Good / Fair / Poor \_\_\_\_\_  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No \_\_\_\_\_  
Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect / NA* Standing: *Good / Fair / Poor*  
Other observations: \_\_\_\_\_

NEUROLOGICAL: *NA / Motor / Sensory / Reflexes / Dural* \_\_\_\_\_

BASELINES (pain or functional activity): \_\_\_\_\_

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

PDM ERP

Resisted Test Response (pain) \_\_\_\_\_

Other Tests \_\_\_\_\_

### SPINE

Movement Loss \_\_\_\_\_  
Effect of repeated movements \_\_\_\_\_  
Effect of static positioning \_\_\_\_\_  
Spine testing *Not relevant / Relevant / Secondary problem* \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

Extremities

Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
OTHER \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

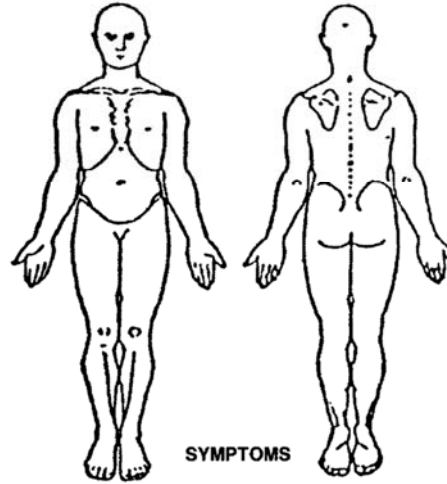
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## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex \_\_\_\_\_ M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other \_\_\_\_\_  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes \_\_\_\_\_  
Previous treatments \_\_\_\_\_  
General health: Good / Fair / Poor \_\_\_\_\_  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No \_\_\_\_\_  
Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect / NA* Standing: *Good / Fair / Poor*  
Other observations: \_\_\_\_\_

NEUROLOGICAL: *NA / Motor / Sensory / Reflexes / Dural* \_\_\_\_\_

BASELINES (pain or functional activity): \_\_\_\_\_

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

PDM ERP

Resisted Test Response (pain) \_\_\_\_\_

Other Tests \_\_\_\_\_

### SPINE

Movement Loss \_\_\_\_\_  
Effect of repeated movements \_\_\_\_\_  
Effect of static positioning \_\_\_\_\_  
Spine testing *Not relevant / Relevant / Secondary problem* \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

Extremities

Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
OTHER \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

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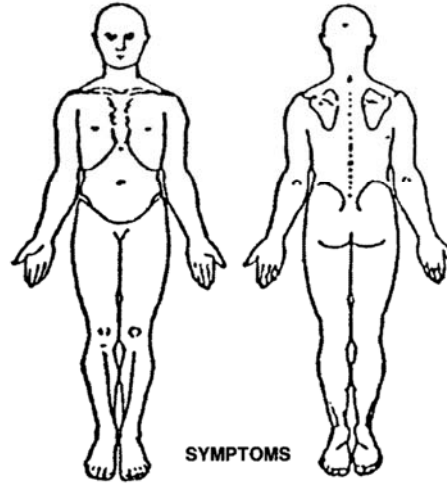






## THE MCKENZIE INSTITUTE LOWER EXTREMITIES ASSESSMENT

Date \_\_\_\_\_  
Name \_\_\_\_\_ Sex M / F  
Address \_\_\_\_\_  
Telephone \_\_\_\_\_  
Date of Birth \_\_\_\_\_ Age \_\_\_\_\_  
Referral: GP / Orth / Self / Other \_\_\_\_\_  
Work: Mechanical stresses \_\_\_\_\_  
Leisure: Mechanical stresses \_\_\_\_\_  
Functional disability from present episode \_\_\_\_\_  
Functional disability score \_\_\_\_\_  
VAS Score (0-10) \_\_\_\_\_



### HISTORY

Present symptoms \_\_\_\_\_  
Present since \_\_\_\_\_ Improving / Unchanging / Worsening  
Commenced as a result of \_\_\_\_\_ Or No Apparent Reason  
Symptoms at onset \_\_\_\_\_ Paraesthesia: Yes / No  
Spinal history \_\_\_\_\_ Cough / Sneeze +ve / -ve  
Constant symptoms: \_\_\_\_\_ Intermittent Symptoms: \_\_\_\_\_

**Worse** bending sitting / rising / first few steps standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
Other \_\_\_\_\_  
**Better** bending sitting standing walking stairs squatting / kneeling  
am / as the day progresses / pm when still / on the move Sleeping: prone / sup / side R / L  
other \_\_\_\_\_

Continued use makes the pain: Better Worse No Effect Disturbed night Yes / No  
Pain at rest Yes / No Site: Back / Hip / Knee / Ankle / Foot  
Other Questions: Swelling Clicking / Locking Giving Way / Falling

Previous episodes \_\_\_\_\_  
Previous treatments \_\_\_\_\_  
General health: Good / Fair / Poor \_\_\_\_\_  
Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other \_\_\_\_\_  
Imaging: Yes / No \_\_\_\_\_  
Recent or major surgery: Yes / No \_\_\_\_\_ Night pain: Yes / No \_\_\_\_\_  
Accidents: Yes / No \_\_\_\_\_ Unexplained weight loss: Yes / No \_\_\_\_\_

**Summary** Acute / Sub-acute / Chronic Trauma / Insidious Onset  
Sites for physical examination Back / Hip / Knee / Ankle / Foot Other: \_\_\_\_\_

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## EXAMINATION

### POSTURAL OBSERVATION

Sitting *Good / Fair / Poor* Correction of Posture: *Better / Worse / No Effect / NA* Standing: *Good / Fair / Poor*  
Other observations: \_\_\_\_\_

NEUROLOGICAL: *NA / Motor / Sensory / Reflexes / Dural* \_\_\_\_\_

BASELINES (pain or functional activity): \_\_\_\_\_

EXTREMITIES *Hip / Knee / Ankle / Foot*

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Flexion					
Extension					
Dorsi Flexion					
Plantar Flexion					

	Maj	Mod	Min	Nil	Pain
Adduction / Inversion					
Abduction / Eversion					
Internal Rotation					
External Rotation					

Passive Movement (+/- over pressure) (note symptoms and range): \_\_\_\_\_

	PDM	ERP
_____		
_____		

Resisted Test Response (pain) \_\_\_\_\_

Other Tests \_\_\_\_\_

### SPINE

Movement Loss \_\_\_\_\_  
Effect of repeated movements \_\_\_\_\_  
Effect of static positioning \_\_\_\_\_  
Spine testing *Not relevant / Relevant / Secondary problem* \_\_\_\_\_

Baseline Symptoms \_\_\_\_\_

Repeated Tests	Symptom Response		Mechanical Response	
Active/Passive movement, resisted test, functional test	During – Produce, Abolish, Increase, Decrease, NE	After – Better, Worse, NB, NW, NE	Effect – ↑ or ↓ ROM, strength or key functional test	No Effect
Effect of static positioning				

### PROVISIONAL CLASSIFICATION

#### Extremities

#### Spine

Dysfunction – Articular \_\_\_\_\_ Contractile \_\_\_\_\_  
Derangement \_\_\_\_\_ Postural \_\_\_\_\_  
OTHER \_\_\_\_\_

### PRINCIPLE OF MANAGEMENT

Education \_\_\_\_\_ Equipment Provided \_\_\_\_\_  
Exercise and Dosage \_\_\_\_\_  
Barriers to recovery \_\_\_\_\_  
Treatment Goals \_\_\_\_\_

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## THE MCKENZIE INSTITUTE RE-ASSESSMENT FORM

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

### Check of Management Strategies:

Posture Correction:: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

### Symptomatic Presentation:

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

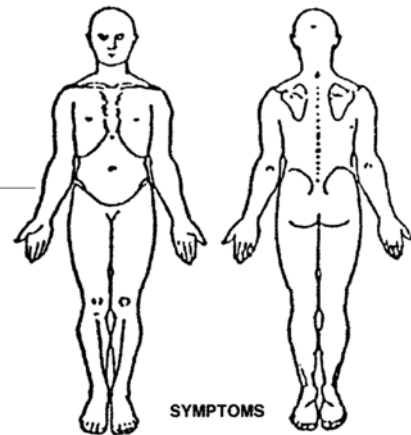
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



### Mechanical Presentation:

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

**SUMMARY:** Better / Same / Worse Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement Dysfunction Posture OTHER (subgroup) \_\_\_\_\_

### Management Today:

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan:: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_ Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_ Night Roll \_\_\_\_\_

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## THE MCKENZIE INSTITUTE RE-ASSESSMENT FORM

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

### Check of Management Strategies:

Posture Correction:: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

### Symptomatic Presentation:

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

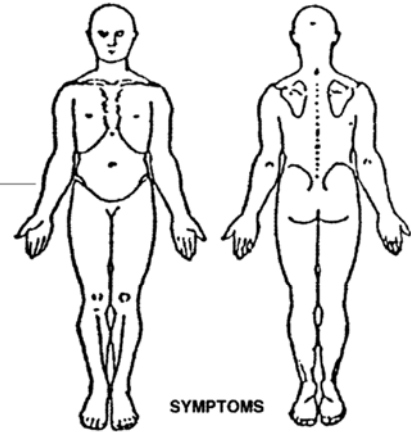
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



### Mechanical Presentation:

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

**SUMMARY:** Better / Same / Worse Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement

Dysfunction

Posture

OTHER (subgroup) \_\_\_\_\_

### Management Today:

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_

Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_

Night Roll \_\_\_\_\_

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## THE MCKENZIE INSTITUTE RE-ASSESSMENT FORM

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

### Check of Management Strategies:

Posture Correction: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

### Symptomatic Presentation:

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

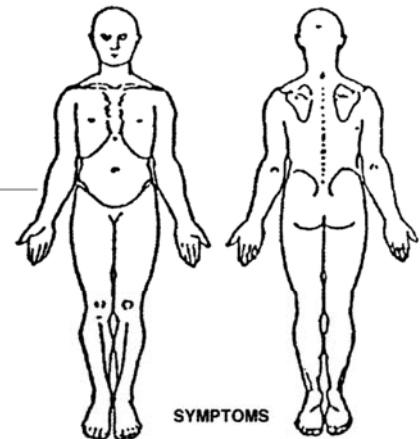
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



### Mechanical Presentation:

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

**SUMMARY:** Better / Same / Worse Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement Dysfunction Posture OTHER (subgroup) \_\_\_\_\_

### Management Today:

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_ Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_ Night Roll \_\_\_\_\_

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## THE MCKENZIE INSTITUTE RE-ASSESSMENT FORM

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

### Check of Management Strategies:

Posture Correction:: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

### Symptomatic Presentation:

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

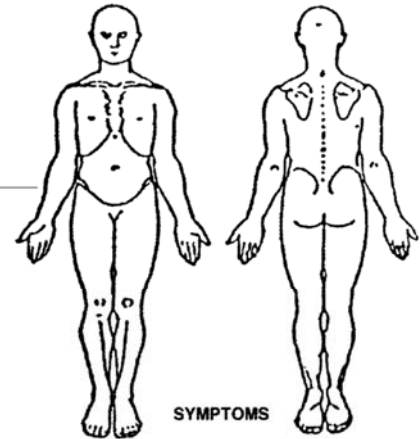
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



### Mechanical Presentation:

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

SUMMARY: Better / Same / Worse

Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement

Dysfunction

Posture

OTHER (subgroup)

### Management Today:

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan:: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_

Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_

Night Roll \_\_\_\_\_

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## THE MCKENZIE INSTITUTE RE-ASSESSMENT FORM

Date \_\_\_\_\_ Name \_\_\_\_\_ Visit Number \_\_\_\_\_

### Check of Management Strategies:

Posture Correction: Yes / No

Performing Exercises: Yes / No

Frequency: Appropriate / Not appropriate Symptom Response when performing exercises \_\_\_\_\_

Technique: Good / Needs correcting

Compliance / Commitment Excellent / Good / Fair / Poor

### Symptomatic Presentation:

Pain Location: Centralised / Same / Peripheralised \_\_\_\_\_

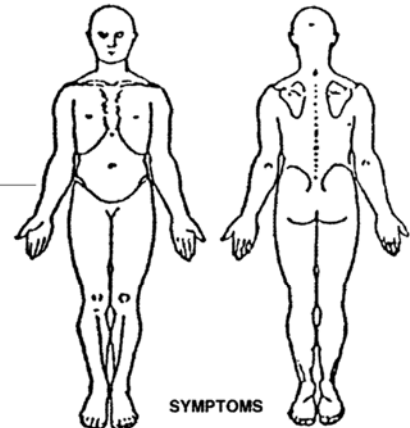
Frequency: Better / Same / Worse

Severity: 0 \_\_\_\_\_ 10  
Better / Same / Worse

Functional Status: % improvement since initial assessment:

0 \_\_\_\_\_ 100%

Functional questionnaire: \_\_\_\_\_



### Mechanical Presentation:

Sitting Posture: Good / Fair / Poor

Standing Posture: Good / Fair / Poor

Deformity: Yes / No / Not applicable

Neurological Testing: Better / Same / Worse / Not applicable \_\_\_\_\_

Movement Loss: Better / Same / Worse \_\_\_\_\_

Current Exercise Technique: Good / Needs correcting

Symptom Response: \_\_\_\_\_

Repeated Movements: Better / Same / Worse \_\_\_\_\_

**SUMMARY:** Better / Same / Worse Overall improvement since initial assessment: 0 \_\_\_\_\_ 100%

Classification Confirmed: Yes / No

Further Testing (if required)

Repeated Movements: \_\_\_\_\_

Other Testing: \_\_\_\_\_

Revised Classification (if appropriate):

Derangement Dysfunction Posture OTHER (subgroup) \_\_\_\_\_

### Management Today:

Education: \_\_\_\_\_

Mechanical Treatment: \_\_\_\_\_

Plan: \_\_\_\_\_

Barriers to Recovery: \_\_\_\_\_

Equipment Provided: Lumbar Roll \_\_\_\_\_ Cervical Roll \_\_\_\_\_

TYOB/TYON/TYOS/TYOK \_\_\_\_\_ Night Roll \_\_\_\_\_

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## APPENDIX 2:

## REFERENCES



***To ensure that you have access to the most recent references related to this manual, please visit***

***<http://www.mckenzieinstitute.org/clinicians/research-and-resources/>***







# THE MCKENZIE INSTITUTE INTERNATIONAL COURSE EVALUATION FORM

Course: A B **C** D E Location: Date:

Instructor 1:

Instructor 2:

Please circle the numbers that most accurately reflects your opinion

**5 = Strongly Agree**      **4 = Agree**      **3 = Neutral**      **2 = Disagree**      **1 = Strongly Disagree**

- |    |  |   |   |   |   |   |     |
|----|--|---|---|---|---|---|-----|
| 1. | Course Material was useful             | 5 | 4 | 3 | 2 | 1 | N/A |
| 2. | Patient Treatment Sessions were useful | 5 | 4 | 3 | 2 | 1 | N/A |
| 3. | Problem Solving Sessions were useful   | 5 | 4 | 3 | 2 | 1 | N/A |
| 4. | Practical Sessions were useful         | 5 | 4 | 3 | 2 | 1 | N/A |

5. Were the course Aims and Objectives achieved?

Instructor 1	5	4	3	2	1	
Instructor 2	5	4	3	2	1	N/A

Comment.....

6. Was there a sufficient balance between theory, problem solving activities, and practical sessions:

Instructor 1	5	4	3	2	1	
Instructor 2	5	4	3	2	1	N/A

Comment.....

7. Was the course material presented in a way to assist you to be a better clinician?

Instructor 1	5	4	3	2	1	
Instructor 2	5	4	3	2	1	N/A

Comment.....

8. Did the Instructor present the course content in a clear and precise manner?

Instructor 1	5	4	3	2	1	
Instructor 2	5	4	3	2	1	N/A

Comment.....

9. Did the Instructor/s create a comfortable learning environment where you were able to ask questions and participate in discussion?

Instructor 1	5	4	3	2	1	
Instructor 2	5	4	3	2	1	N/A

Comment.....

10. Please list the two most important matters regarding the course that assisted you to learn:

.....

11. Please list the two factors that could be improved to assist with your learning:

.....

*Please use back of sheet for comments if required.*  
**We appreciate you completing this evaluation form**