Centralization In McKenzie Method
A series of 10 patients

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McKenzie approach

- One of the most practiced and studied methods
- Self-treatment with exercises
- Repeated end-range of motion tests to identify the movement direction which centralizes leg symptoms into the low back, which is the centralization phenomenon
The modern approach to manage spine problems involves reassurance and reactivation.

Most back problems are simple, uncomplicated mechanical disorders (Waddell, 1998) the patient should be reassured that the prognosis for speedy recovery is excellent (Waddell, 1998; Deyo and Weinstein, 2001).

Self-treatment with exercise is the proven “benchmark” and should be started immediately in order to prevent disability and treat chronic pain (Carey et al. 2000).
Exercise is superior to passive care when utilized in treating failed back surgery patients (Timm et al. 1994). Moreover, when comparing different types of exercise, studies showed that the low-tech exercise (in McKenzie and stabilization) is superior to high technology exercise (isotonics & Cybex).

The McKenzie method is as effective as the isotonic strengthening program.

McKenzie was superior during a 2 months follow-up, but no differences were noticed at 8 months follow-up. (Petersen et al. 2002)
McKenzie classifies pain in 3 syndromes

- Postural
- Dysfunction
- Derangement
Postural Syndrome

The pain is produced when:

- Normal tissues in the back are under an end of range stress
- Prolonged sitting position
- Over a period of time
- Due to sustained position

Treatment principle:
- Correct posture while doing the offending activity
Dysfunction

Pain:
- Occurs when abnormal tissues are under end of range stresses like bending forward
- This adaptive shortening of scar tissue is related to previous unhealed injury
- Intermittent

Treatment principle:
- Stretch and remodel the affected tissues and correct posture
Derangement

- Most frequent syndrome
- Disc changes maybe caused by an injury
- Pain:
  - in the back and/or leg
  - Pain can be intermittent or constant
  - Better or worse according to the movements

Treatment principle
- Repetitive exercises according to the derangement direction
- Long term exercises
- Education and prevention of injuries
CENTRALIZATION IN MCKENZIE METHOD
The phenomenon of centralization was first recognized by Robin McKenzie in the 1950s and further much experimentation and verification were described in the literature.

Centralization is the process by which pain radiating from the spine is consecutively abolished, from distal to proximal, in response to therapeutic positions or movements and induces reduction and abolition of spinal pain.

Centralization can occur in the lumbar, cervical, and thoracic spine.
There was consensus around the core definition of centralization:

- The abolition of distal pain in response to the deliberate application of movements or postures. If pain is only in the back this is centralized and then abolished.
- To this definition, Fritz added that changes in neurological signs and symptoms also occur in centralization.
Centralization and prognosis

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Prevalence and prognostic association of centralization

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$\% C =$ proportion in which centralization occurred. Wernke et al. (1999), (see text).
CENTRALIZATION A SERIES OF 10 PATIENTS
Objective

This study examined the relationship between the pain scale and the centralization:

- 10 patients
- Complaining of non-specific low back pain
- Diagnosed with derangement syndrome
- Treated by the McKenzie method
Inclusion criteria

- Patients aged 20 – 75 years
- Complaining of low back pain and associated with referred pain to the leg
- Referred pain was defined as reported pain distal to central on the Donelson modified body grid
Assessment: Donelson modified body grid
Assessment: lumbar spine

Red and yellow flags
Assessment: lumbar spine

**EXAMINATION**

**POSTURE**
- Sitting: Good / Fair / Poor
- Standing: Good / Fair / Poor
- Lordosis: Red / Acc / Normal
- Lateral Shift: Right / Left / Nil
- Generalisation of Posture: Better / Worse / No effect
- Relevant: Yes / No

Other Observations:

**NEUROLOGICAL**
- Motor Deficit
- Sensory Deficit
- Reflexes
- Dural Signs

**MOVEMENT LOSS**

<table>
<thead>
<tr>
<th>Flexion</th>
<th>Extension</th>
<th>Side Gliding R</th>
<th>Side Gliding L</th>
<th>Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maj</td>
<td>Mod</td>
<td>Min</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Pretest symptoms standing:</th>
<th>Symptoms During Testing</th>
<th>Symptoms After Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rep FIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rep EIS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Pretest symptoms lying:    |                         |                        |
| FIL                       |                         |                        |
| Rep FIL                   |                         |                        |
| EIL                       |                         |                        |
| Rep EIL                   |                         |                        |

| If required pretest symptoms: |                         |                        |
| SGIS – R                    |                         |                        |
| Rep SGIS - R                |                         |                        |
| SGIS - L                    |                         |                        |
| Rep SGIS - L                |                         |                        |

**STATIC TESTS**

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

**OTHER TESTS**

**PROVISIONAL CLASSIFICATION**

<table>
<thead>
<tr>
<th>Derangement</th>
<th>Dysfunction</th>
<th>Posture</th>
<th>Other</th>
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<td>Derangement: Pain location</td>
<td></td>
<td></td>
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**PRINCIPLE OF MANAGEMENT**

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

- Education on proper body mechanics, correct postures, advice to stay active, coping strategy
- Repetitive extension principle in lying, 15 repetitions, 3 times per day
- Repetitive extension principle in standing, 15 repetitions, every 2 hours
Intervention

- Repetitive extension principle in standing, 15 repetitions, every 2 hours
Intervention

- The same protocol was applied on each visit
- Subjects were followed for a maximum of 9 visits over a maximum period of 6 weeks
Study Results

Subject’s responses to the treatment were divided into 2 groups:

- Centralized and abolished (group 1)
- Symptoms centralization (group 2)
Group 1: Centralized and abolished

The group consisted of 4 subjects:

- with LBP whose initial distal symptoms were located on the area marked “zero” and moved proximally and then abolished
Group 2: symptoms centralization

The centralizing group consisted of 6 subjects:

- Initial distal symptoms were located outside the area marked “Zero” and thereafter moved to a more proximal location, but never abolished nor reached area “Zero” on the Donelson modified body grid.
Data analysis:

Data analysis was applied on Excel program
Two variables were used for comparison

- Visual Analogue Scale (VAS)
- Donelson modified body grid
<table>
<thead>
<tr>
<th></th>
<th>Pre-treatment</th>
<th></th>
<th>Post-treatment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td>Male</td>
</tr>
<tr>
<td>Number of Patients</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>46.6</td>
<td>39.6</td>
<td>43.1</td>
<td>46.6</td>
</tr>
<tr>
<td>Range of age</td>
<td>(20-75)</td>
<td>(24-61)</td>
<td>(20-61)</td>
<td>(20-75)</td>
</tr>
<tr>
<td>Previous episodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.4</td>
<td>3</td>
<td>2.7</td>
<td>2.4</td>
</tr>
<tr>
<td>Range of Number of episodes</td>
<td>(0-4)</td>
<td>(1-7)</td>
<td>(0-7)</td>
<td>(0-4)</td>
</tr>
<tr>
<td>Pain (VAS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.8</td>
<td>5.4</td>
<td>5.1</td>
<td>1.4</td>
</tr>
<tr>
<td>Range of intensity of pain</td>
<td>(3-7)</td>
<td>(4-8)</td>
<td>(3-8)</td>
<td>(0-3)</td>
</tr>
<tr>
<td>Donelson modified body grid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.6</td>
<td>2</td>
<td>2.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Range of score</td>
<td>(1-5)</td>
<td>(1-3)</td>
<td>(1-5)</td>
<td>(0-1)</td>
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Results: Pain improvement

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<thead>
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<th>Post-treatment</th>
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<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
<td>5.4</td>
</tr>
<tr>
<td>Female</td>
<td>4.8</td>
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Pain Intensity
Results: centralization

Modified Donelson Body Grid

- Pre-treatment Male: 2.6
- Pre-treatment Female: 2
- Post-treatment Male: 0.2
- Post-treatment Female: 0.8

Male
Female
Centralization provides physiotherapists with a clinical tool to differentiate groups with different outcomes and it is a management tool to identify appropriate specific exercises or postures.

The prevalence of the centralization is a green light for both the patient and the physical therapist.

Centralization is an important prognostic indicator and it should be monitored routinely in order to guide the treatment management.

The non-centralization is an important predictor of poor outcomes.
Discussion

- The presence of centralization in the examination/treatment process has been a predictor of good patient outcomes with both acute and chronic spine pain (Donelson, Sukva, and Murphy, 1990; Long, 1995; Sufka et al, 1998)

- Sufka et al (1998), and Werneke, Hart, and Cook (1999) demonstrated that practitioners have shown high levels of agreement on the existence of centralization and that for low back pain patients, McKenzie therapy results in a greater decrease in pain in the short term than do other standard therapies.
Limitations

- Limited number of patients 10
- Correlations between ROM, pain and symptoms centralization will be good to elaborate
The difference between initial and final assessments of centralization upon the Donelson modified body grid seems to indicate a positive relation between the process of centralization and decreasing of pain.
THANK YOU