Mechanical Diagnosis And Therapy® of the Cervical Spine

The McKenzie Method®

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Smart Sport International™
Austin, Texas
Background

**Physical Therapist**
- Queen’s University 1988

**McKenzie Training**
- Diploma Program 1998
- Editor, Journal of MDT®

**Certified Coach**
- USA Triathlon
- USA Track and Field
Austin, Texas
Smart Sport International™

Sports Science Solutions for Rehabilitation and Training™
It’s All About The Journey, Not The Destination …
“McKenzie”

The word conjures up many things to many people … depending on your perspective and context …
The McKenzie Method®

Robin McKenzie – New Zealand

Three texts:
- Lumbar spine 1981; 2003
- Cervical/Thoracic spine 1990
- Extremities 2000
The McKenzie Method®

Myths:

It’s not ….

... Only the lumbar spine ...

... “McKenzie extension exercises” ...

... A treatment protocol (i.e. “what do I do if the McKenzie protocol doesn’t work?”)
The McKenzie Method®

- Mechanical Diagnosis® and Therapy
- A Dynamic System of Assessment, Diagnosis, Treatment and Prevention

- a process of thinking and clinical reasoning
Mechanical Diagnosis And Therapy®

Mechanical Assessment And Diagnosis

- Logical, well-defined algorithm
- Consistent, standardized terminology
- Reproducible and reliable
Mechanical Diagnosis And Therapy®

Mechanical Assessment And Diagnosis

- Cost-effective
- Identifies responders AND non-responders, mechanical and non-mechanical presentations
- Applicable to contact and non-contact injuries
Mechanical Diagnosis And Therapy®

Treatment And Prevention

- Active patient treatment philosophy
- Encourages patients to be involved in the management of their own treatment
- Most patients can successfully treat themselves when provided the necessary knowledge and tools
But first …

… some basic concepts would be appropriate …. 
Pain

- Chemical
- Mechanical

Consistent behaviors
Chemical Pain

- Sufficient chemical concentration to activate nociceptors
- Causes can include:
  - Trauma
  - Acute Inflammatory Response
- Constant symptoms – “car stereo”
Mechanical Pain

- Mechanical deformation of tissue
  - Sustained loading
  - Repetitive loading
- Constant or intermittent symptoms
- No pathology need exist (“bent finger”)
- Most spinal pain is mechanical in nature
Centralization

- First described by McKenzie in his lumbar spine text in 1981 ... first experience clinically in 1956
- Diagnostic and prognostic indicator
The Cervical Spine

- It’s not just a “little lumbar spine”
- Form Follows Function
  - Vertebral body shape
  - Facet joint orientation
  - Intervertebral disc construction
The goal is to understand how this problem behaves mechanically …

… using a well-defined algorithm, classify the problem …

… and use that classification to guide treatment.
Athlete Interview

History

- Current symptoms
- Onset and nature of symptoms
- Better/Worse
- Red Flags – contraindications to mechanical therapies

- Establish a hypothetical mechanical diagnosis
Physical Examination

- Posture
- Neurological examination
- Movement loss
- Mechanical loading strategies
  - Repeated movements
  - Static tests
- Other tests
Mechanical Loading Strategies

- Mechanical Loading Strategies = applied mechanical forces
  - Repeated movements
  - Sustained postures
  - Sagittal plane before frontal plane
Repeated Movements

Repeated end range movements

- Protrusion
- Retraction
- Retraction Extension
- Flexion
- Side bending
- Rotation
Repeated Movements

- Protrusion
  - Upper cervical end range extension
  - Lower cervical midrange flexion
Repeated Movements

Retraction

- Upper cervical end range flexion
- Lower cervical midrange extension
Repeated Movements

- Retraction
- Extension
  - Upper cervical end range extension
  - Lower cervical end range extension
Sustained Postures

- Static end range loading
  - Protrusion
  - Retraction
  - Flexion
  - Extension
Sustained Postures

Protrusion

Retraction
Assessment

Before the application of mechanical loads
- establish baselines
  - Symptoms/Mechanics/Function

During the application of mechanical loads

After the application of mechanical loads – assess response and review baselines
  - Symptoms/Mechanics/Function
The goal is to understand how this problem behaves mechanically …

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Mechanical Diagnosis and Classification

- **Posture Syndrome**
  - End range stresses on normal structures

- **Derangement Syndrome**
  - Anatomical disruption or displacement within the motion segment
  - Centralization/peripheralization

- **Dysfunction Syndrome**
  - End range stresses on shortened structures
Relevant Features - Posture

- **Symptoms**: None
- **Movement Loss**: None
- **Effect of Loading Strategies**: Symptoms reproduced with static loading only
- **Description**: Physical exam normal
Relevant Features - Derangement

- Symptoms
- Movement Loss
- Effect of Loading Strategies
- Description

Local +/- Peripheral
- Yes
- Lasting change
  - Decrease
  - Abolish
  - Centralize

“The barking dog”
Relevant Features - Dysfunction

- Symptoms
- Movement Loss
- Effect of Loading Strategies
- Description

- Local +/- Peripheral
- Yes
- No lasting change – pain only at limited end range
- “The grandfather clock”
Algorithm

- **History**
  - Establish a hypothetical mechanical diagnosis

- **Physical Examination**
  - Establish a mechanical diagnosis

- **RED FLAGS**
  - Contraindications to mechanical therapies
Day 1 classification:

- Loading strategies decrease, abolish or centralise symptoms – DERANGEMENT (reducible)
- No loading strategies decrease, abolish or centralise symptoms – DERANGEMENT (irreducible)
- Pain ONLY at limited end range – DYSFUNCTION
- Pain ONLY on static loading with physical exam normal – POSTURE
- OTHER
Algorithm

Classification confirmed within 3 to 5 visits

If failure to enter a spinal mechanical classification – consider other options

- Lateral canal stenosis
- Central canal stenosis
- Mechanically inconclusive
- Shoulder
- Chronic pain states
- Inflammatory
# Classification Summary

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Posture</th>
<th>Effect of Loading Strategies</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain on static loading only</td>
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<td>Decrease Abolish Centralize</td>
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</tbody>
</table>

<table>
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<tr>
<th>Movement Loss</th>
<th>No</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>Derangement</th>
<th>Local +/- Peripheral</th>
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</table>

<table>
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<tr>
<th>Dysfunction</th>
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- Pain on static loading only produces only at limited end range stresses on shortened structures.
The Numbers Game

The largest percentage of clinical cases will be Derangements
Clinical Examples

- Cycling
- Triathlon
Case Study #1 - Cycling

History
- 35 year old triathlete with constant right cervical and suprascapular pain
- Onset during a long training ride
- Worse with cycling, sitting, turning to the right; Better when supine lying

Physical Examination
- Movement loss – extension and right sidebending
- Repeated movements – symptoms decrease/centralize and remain better after retraction and retraction extension; movement improves
Case Study #2 - Cycling

History
- 35 year old triathlete with intermittent right cervical and suprascapular pain
- Onset during a long training ride
- Worse with cycling only (> 1 hour)

Physical Examination
- Movement loss – nil
- Repeated movements – no effect
- Symptoms reproduced with static positioning in aero position on bike only, no worse after changing position
Clinical Examples

Football
Case Study #3 - Football

History
- 20 year old offensive lineman with intermittent right cervical, shoulder and arm pain
- Onset during a scrimmage – no specific mechanism that player remembers
- Worse with sitting, reading, turning to the right; Better when supine lying
- No dizziness, tinnitus, headache

Physical Examination
- Movement loss – flexion, extension, right rotation and right sidebending
- Repeated movements – symptoms decrease/centralize and remain better after retraction and retraction extension; movement improves in all planes
Case Study #4 - Football

History
- 20 year old offensive lineman with intermittent right cervical, shoulder and arm pain
- Onset during a scrimmage 2 years ago – no specific mechanism that player remembers
- Does not report being better or worse with any specific activities
- No dizziness, tinnitus, headache

Physical Examination
- Movement loss – flexion and left sidebending
- Repeated movements – symptoms reproduced with flexion and left sidebending and do not remain worse afterwards; no change in movement
The goal is to understand how this problem behaves mechanically …

… using a well-defined algorithm, classify the problem based on mutually exclusive criteria …

… and use that classification to guide treatment.
“Just as the Three R’s – Readin’, Ritin’ and ‘Rithmetic – were the basics of primary education …
Treatment

... so are the three R’s in the treatment of musculoskeletal conditions, “Reeducation of posture, Remodeling of dysfunction, and Reduction of derangement”, the basics of therapy for mechanical spinal disorders.”

Robin McKenzie, 1990
Self-Treatment Concept

“Give a man a fish
and you feed him for a day.
Teach a man to fish
and you feed him for a lifetime.”

Chinese Proverb
Self-Treatment Concept

- “Treat Your Own Back”
- “Treat Your Own Neck”
<table>
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<th>Treatment</th>
<th>Posture</th>
<th>Derangement</th>
<th>Dysfunction</th>
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</thead>
<tbody>
<tr>
<td>Reeducation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reduction</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Remodeling</td>
<td>No</td>
<td>No</td>
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Treatment

- Reeducation of posture
  - Maintenance of lordosis (static; dynamic)
  - Daily function (i.e. sitting)
  - Sport-specificity - knowledge of biomechanics of sport technique
Treatment

Remodeling of Dysfunction

- Shortened tissue – must be taken to end range to remodel
- Direction that reproduces symptoms
- Cyclical loading vs sustained loading (creep)
Treatment

- Reduction of Derangement
  - “directional preference”
  - Mechanical loading strategies that cause symptoms and mechanics to remain better
  - Temporary avoidance of mechanical loading strategies that cause symptoms and mechanics to remain worse
Treatment

Reduction of Derangement

- Patient-generated forces before therapist generated forces are applied

- 70% of patients will be able to successfully self-treat without adding therapist-generated forces
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**Derangement Syndrome**
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Posture Syndrome
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**Dysfunction Syndrome**
Prevention

- Minimize recurrence - TYON
- Activities of Daily Living
- Sport technique/biomechanics
- Rapid management if symptoms do recur
MDT – A Functional Approach To Sports Injuries

- Quickly and effectively differentiate responders and non responders

- Athlete mindset – “confronters”
MDT – A Functional Approach To Sports Injuries

“Training sessions” consist of sustained postural loading and repetitive mechanical loading.

MDT has a functional emphasis on mechanical loading strategies as part of it’s assessment algorithm.
MDT – A Functional Approach To Sports Injuries

- Applicable to all sports injuries – contact and non-contact sports
Challenges Of An Active Population

“More must be better”

Athletes - the opposite of “non-organic”!

“Day affects play”
MDT In The Big Picture

“It’s not just for spines anymore”!
“a 40 minute adventure” – strongly suggest taking the courses!

Continuing Education program
- Parts A, B, C, D, E
- Credentialing Exam – competency
- Diploma
Where To Find Out More

- [www.mckenziemdt.org](http://www.mckenziemdt.org)  
  - Great reference list

- [info@mckenziemdt.org](mailto:info@mckenziemdt.org)

- 315-471-7612

- McKenzie products and assessment forms are available at [www.optp.com](http://www.optp.com)
Today is brought to you by the letter G ...
... and the number .... 7 ... 😊