The BIO of the BioPsychoSocial Approach

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Back pain accounts for approximately 50% of all patients treated in outpatient physical therapy practices.
Would you manipulate?

- 29 y/o with 10 day history of right L4-S1 region LBP.
- No Red Flags
- Hypomobile L4

There remain large inconsistencies in manipulation utilization in the management of LBP.
Maitland Concept

- Reproducible ‘astericks’
- Continual monitoring of response to Rx
- The art of manipulative physiotherapy
- And a total commitment to the patient

McKenzie Concept

- Theoretical construct flowed from Cyriax
  - Mechanical diagnosis
- Repeated movements
  - Preferred direction
  - Centralization
  - Peripheralization
  - Focus on patient self-management
Mulligan concept

- Mulligan’s concept of mobilisations with movement (MWMS)
- Convex-concave rule
- Joint glide force applied & sustained while impaired action, painlessly performed.

Osteopathic concept

- ‘Holistic’ approach to care
  - Somatic dysfunction
- Observation, palpation and passive motion assessment key to Structural Diagnosis.
- Diagnostic triad:
  - Asymmetry
  - Range of motion & end-feel
  - Tissue texture
Wrinkles on the inside are normal!

MRI & CT Findings in Individuals Without Low Back Pain


The biopsychosocial model implies that treatment of disease processes, requires that the health care team address biological, psychological and social influences upon a patient's functioning.

The biopsychosocial model states that the workings of the body can affect the mind, and the workings of the mind can affect the body.
Exciting & practice changing....
Actual Statements from PTs

- You should not use manipulation in LBP as it takes the locus of control away from the patient.
- All pain is in the brain so performing manual interventions is counterproductive.
- If you are using dry needling that’s akin to assaulting the patient.

Evidence Update for Spinal Manipulation

John D. Childs, PT, PhD, MBA, FAPTA
CEO, Evidence in Motion
Low Back Pain Sub-groups

Manipulation  ↓  Classification Criteria  ↓  Manipulation and exercise

Specific Exercise  ↓  Classification Criteria  ↓  Activities to Promote Centralization

Stabilization  ↓  Classification Criteria  ↓  Stabilization exercises

Traction  ↓  Classification Criteria  ↓  Mechanical/automatic traction

Spinal Manipulative Therapy for Chronic Low-Back Pain

Conclusions. High-quality evidence suggests that there is no clinically relevant difference between SMT and other interventions for reducing pain and improving function in patients with chronic low-back pain. Determining cost-effectiveness of care has high priority.

Sidney M. Rubinstein, DC, PhD,* Marienke van Middelkoop, PhD,+ Willem J.J. Assendelft, MD, PhD,‡ Michiel R. de Boer, PhD,§ and Maurits W. van Tulder, PhD ¶

Spine Volume 36, Number 13, pp E825-E846
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Spinal Manipulative Therapy for Acute Low Back Pain

An Update of the Cochrane Review

Sidney M. Rubinstein, PhD,* Caroline B. Terwee, PhD,* Willem J. J. Assendelft, MD, PhD,†Michiel R. de Boer, PhD,§ and Maurits W. van Tulder, PhD*§

Conclusion. SMT is no more effective for acute low back pain than inert interventions, sham SMT or as adjunct therapy. SMT also seems to be no better than other recommended therapies. Our evaluation is limited by the few numbers of studies; therefore, future research is likely to have an important impact on these estimates. Future RCTs should examine specific subgroups and include an economic evaluation.

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Low Back Pain

Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability, and Health from the Orthopaedic Section of the American Physical Therapy Association

INTerventions – Manual Therapy: Clinicians should consider utilizing thrust manipulative procedures to reduce pain and disability in patients with mobility deficits and acute low back and back-related buttock or thigh pain. Thrust manipulative and nonthrust mobilization procedures can also be used to improve spine and hip mobility and reduce pain and disability in patients with subacute and chronic low back and back-related lower extremity pain. (Recommendation based on strong evidence.)
Assessment of diclofenac or spinal manipulative therapy, or both, in addition to recommended first-line treatment for acute low back pain: a randomised controlled trial

Mark J Hancock, Chris G Maher, Jane Ledmere, Andrew J McLocklin, Chris W Cooper, Richard O Day, Megan F Spindler, James H McAuley

THE LANCET

Lancet 2007; 370: 1638-43
A Clinical Prediction Rule for Classifying Patients with Low Back Pain Who Demonstrate Short-Term Improvement With Spinal Manipulation

Timothy Flynn, PT, PhD,† Julie Fritz, PT, PhD,† Julie Whitman, PT, DSc,† Robert Wanner, PT, PhD,*† Jake Magel, PT, DSc,† Daniel Rendeiro, PT, DSc,† Barbara Butler, PT,† Matthew Garbor, PT, DSc,† and Stephen Allison, PT, PhD*
**Patient Admitted**

Evaluation

**MANIPULATION**

50% Reduction in Oswestry?

- yes → SUCCESS

- no

**MANIPULATION**

50% Reduction in Oswestry?

- yes → SUCCESS

- no → FAIL

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**Spinal Manipulation CPR**

*Flynn et al, Spine, 2002*

- Symptoms < 16 days

- No symptoms distal to the knee

- Hip IR > 35 degrees

- Lumbar hypomobility

- FABQWK < 19
A Clinical Prediction Rule To Identify Patients with Low Back Pain Most Likely To Benefit from Spinal Manipulation: A Validation Study

John D. Childs, PT, PhD, MBA
Julie M. Fritz, PT, PhD
Timothy W. Flynn, PT, PhD
James J. Irrgang, PT, PhD
Kevin K. Johnson, PT
Guy R. Majkowski, PT
Anthony Delitto, PT, PhD

131 Patients with LBP in Physical Therapy

- Mean age 33.9 years
- 42% female
- Median duration of sx = 27 days

- Mean Oswestry = 41.2
- 24% sx distal to knee

Manipulation Group n=70
- +CPR n=23
- -CPR n=47

Exercise Group n=61
- +CPR n=24
- -CPR n=37
**Clinical Prediction Rule Validation Study**

- **Graph:**
  - ODQ Score vs. Time (Baseline, 1-week, 4-weeks, 6-months)
  - Lines represent different conditions:
    - + CPR (manip)
    - - CPR (manip)
    - + CPR (exercise)
    - - CPR (exercise)
  - *P<0.001

**Validation of the Rule**

Fritz JM, Childs JD, Flynn TW.
BMC Fam Pract. 2005 Jul 14;6(1):29

**2 factors present:**
- Recent onset (<16 days)
- No symptoms below knee

- **Pre-test Probability of Dramatic Success with Manipulation:** 45%
- **Post-test Probability of Dramatic Success with Manipulation:** 91%
- **+LR = 12.6**
Independent evaluation of a clinical prediction rule for spinal manipulative therapy: a randomised controlled trial

Mark J. Hancock · Christopher G. Maher · Jane Latimer · Robert D. Herbert · James H. McAuley

Eur Spine J

240 Patients with LBP

R

SMT & Placebo

SMT & Placebo

Placebo SMT & Placebo

Placebo SMT & Diclofenac

SMT Group

Placebo Group

Results

![Graph showing results of disability (RDQ) over time (weeks)]
Manipulating Neuroplasticity

Adriaan Louw, PT, PhD, CSMT

Pain is 100% produced by the brain...

Pain is a multiple system output, activated by an individual’s specific pain neural signature.

The neural signature is activated whenever the brain perceives a threat.

Therefore...

Altering information the brain receives (threat)
can potentially alter the pain experience

Bottom Up...

Adapted from Griffen, L.S., Pain, the tissues and the nervous system. Physiotherapy, 1998; 84: p. 27-33.
Top-down:

- Pain neuroscience education
- Fear Avoidance
- Cognitive Behavioral Therapy

Current Focus...

**Endogenous**


**Neuromuscular**

(There is another way...)

Plastic Maps...

Smudging...

- Complex Regional Pain Syndrome
- Spinal Cord Injury
- Phantom Limb Pain
- Dystonia
- Repetitive Strain Injuries
“I can’t find it!”


Clinical Presentation...

Images from Louw
Neuroplasticity: KEY ISSUE

- The CNS undergoes functional and structural changes in people with persistent pain.
- Lead to central sensitization
Sensory Discrimination vs. Integration...

Tactile discrimination, but not tactile stimulation alone, reduces chronic limb pain

G. Lorimer Moseley a,b, Nadia M. Zalucki a,d, Katja Wiech b


Research Question

If we enhanced tactile discrimination of the back, associated with brain remapping improve pain and spinal movement in patients with low back pain?
Case Study

• A 56-year old lady underwent discectomy for low back pain, leg pain and progressive neurological deficit.

• Measurements before, 48h postop and pre/post treatments

• The patient underwent 6 PT treatments aimed at restoring tactile acuity.

Flexion and Straight Leg Raise

**Pressure Pain Thresholds**


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- Pre-treatment
- Post-treatment

**Sensory Discrimination for Chronic Low Back Pain: A Case Series**


- Convenience sample of CLBP patients
  - Low back pain (Numeric Pain Rating Scale)
  - Fear-avoidance (Fear Avoidance Beliefs Questionnaire)
  - Disability (Oswestry Disability Index)
  - Spinal flexion (fingertip-to-floor)
- 5-minute localization of tactile stimuli treatment to the low back
- Immediate post-intervention
  - Pain
  - Spinal flexion.
Results: LBP immediately after GMI
Average pain rating for low back pain decreased by 1.91

Results: Flexion immediately after GMI
Average forward flexion improved by 4.82 cm
What about this?

Geoffrey Maitland…
Grade III Posterior-Anterior Mobilization in Low Back Pain to the Primary Somatosensory Cortex...

In preparation
- Louw, A
- Farrell, K
- Beck, E
- Gillund, J
- Davis, L
- Barclay, M
- Oberhoffer, S
Preliminary Results

- 47 patients (female 26)
- 62.1 years old
- 9.58 years of LBP
- ODI 36.38
- FABQ\textsuperscript{PA} 15.83
- FABQ\textsuperscript{W} 18.33

Statistical significant difference in people who received the neuroscience education versus the biomechanical education to meet or exceed the MDC for SLR after treatment ($p = 0.049$)

People who received a neuroplasticity explanation for central PA mobilizations, compared to biomechanical, was 3.1 times more likely to meet or exceed the MDC for SLR after treatment.

So What?

Pain Science is NOT hands-off

- Sensory Discrimination
- Sensory Integration
- Endogenous Analgesia
- Patient Expectations
- Neuromuscular Effects
- Blood Flow
- CSF Movement
- Graded Exposure
- Etc…
Thank you