MULLIGAN’S Mobilisation with Movement:
The science, the evidence and the art.

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MULLIGAN’S
Mobilisation with Movement:
The science, the evidence and the art.
Mobilisation With Movement = sustained force (accessory glide) while a previously painful (problematic) movement is performed
Mobilisation With Movement =

- discern and measure problem movement
- apply glide & repeat problem movement
- repeat iteration (max 4 times) & observe outcome
Mobilisation With Movement =

only used in treatment plan if the previously painful (problematic) movement is much/substantially improved

Sunday: 1:00 – 1:30 Dr Darren Rivett: MWM and clinical reasoning
...so what is the evidence?

THIS CONFERENCE!!!

Next … Hewitt - MWM: A systematic, critical narrative review.

1:00 – 1:30 Key Note Hall - Are all headaches just a pain from the neck?
MWM + exercise speeds up recovery
Reduces need for other therapies
Fewer recurrences than steroid injections in long term


2:00 - 2:30  MWM for soft tissue injuries such as tennis elbow
MWM works!

THIS CONFERENCE!!!

Next … Hewitt - MWM: A systematic, critical narrative review.
How does it work?

or

What do you tell your patients?
Boney luxations

Reversing luxations

Biomechanical

- Straighten spine (Pare 1958)
- Unlocking locked joint (Twomey 1992)
- Shift an IVD fragment (Cyriax 1975)
- Reduce annular distortion (Farfan 1973)
- Stretching, tearing or rupturing adhesions that limit joint or nerve range (Zusman 1986, Chrisman et al 1964)
- Remove blockage or interference of blood flow (Still 1899), nerve compression (Palmer 1910), sympathetic chain (Kunert 1965), and cerebrospinal fluid circulation (DeJanette 1967)
Paradigms in practice/research

Neurophysiological

Biomechanical
• Correct abnormal somatovisceral reflexes and visceral organ dysfunction (Dhami & DeBoer 1992)
• Stretch contracted muscles, causing relaxation (Perl 1975)
• Remove ‘irritable’ spinal lesions (Korr 1976)
• Intense reflex effects (mainly musculature, Lewit 1985)
• Modulate peripheral nociceptors (Zusman 1987)
• Inhibition of reflex muscle contraction (Zusman 1987)
• Activates gating mechanism, neurotransmitters, opioide peptides (Dhami and DeBoer 1992)
Paradigms in practice/research

Neurophysiological

Biomechanical

MWM
Positional fault hypothesis

Biomechanical

MWM

Sunday: 10.30 – 11:00 Key Note Wayne Hing - Positional Fault – Fact or Fiction

4.5 cm PVAS reduction following 1 treatment

7.4 units/day on Kaikkonen scale with treatment over 5 weeks compared to 1.4 units/day with natural resolution
Positional faults: may well occur but difficult to measure?

Does the MWM reverse positional fault?

R 1st MCP pain with F after hyperabduction injury

Positional fault on MRI: 4° pronation of R 1st MCP

Glide reversed positional fault on MRI

Post-3 weeks self treatment: pain and function improved but positional fault stayed same

Note: therapist was blind to this finding
BIOMECHANICS
Human studies
Transient change in bone position

- MWM versus Sham versus Control
- 11 male & 13 female
- mean age 46.1 ± SD 9.86 yrs
ROM: ICC = 0.98 and SEM 1.33°
Interaction Plot PPT

PPT: ICC = 0.96 and SEM 10.7 kPa

45.1 (1.7 to 88.4)
46.3 (9.1 to 83.6)

Treatment
Sham
Control
BIOMECHANICS

Human studies

- MWM
- Transient change in bone position & Increase ROM
BIOMECHANICS

Human studies

MWM

Transient change in bone position & Increase ROM

NEUROPHYSIOLOGIC

Pain effects human animal

Associated systems & modeling
Transient change in bone position

Increase ROM

Pain effects human

MWM produces an initial hypoalgesia

Treatment effect > placebo/control procedures

Initial hypoalgesia = non-opioid mechanisms

(e.g., Vicenzino et al (2001) Paungmali et al (2003a,b and 2004))

113 anaesthetized Sprague-Dawley Rats

Knee Full & End ROM + Tibia PA/AP for capsaicin induced inflammation of foot.

Mechanical withdrawal test

5-HT & Norad (DPIS)

No local spinal circuitry & no opioid involvement
Initial non-opioid hypo-algesia: DPIS

NEUROPHYSIOLOGIC
Pain effects human animal

BIOMECHANICS
Human studies

MWM

Transient change in bone position & Increase ROM
Initial non-opioid hypo-algesia: DPIS

NEUROPHYSIOLOGIC
Pain effects human animal
Associated systems & modeling

BIOMECHANICS
Human studies

MWM

Transient change in bone position & Increase ROM
Transient change in bone position & Increase ROM

NEUROPHYSIOLOGIC
Pain effects human animal
Associated systems & modeling

Initial sympato-excitation

Adapted from Lovick (1991) & Fanselow (1991)

Stimulus

Dorsal/Lateral PAG

Analgesia (non-opioid)
Sympathoexcitation
Movement

Analgesia (opioid)
Sympathoinhibition
Immobility

Ventrolateral PAG
Characteristics of pain relief:

Mechanical hypoalgesia associated with changes in sympathetic and motor system function

Mimics findings from spinal manipulation inferring involvement of descending pain inhibitory systems

Preliminary animal studies confirming role of endogenous non-opioid mechanisms in manual therapy
Initial non-opioid hypo-algesia: DPIS - PAG mediated?

Neurophysiologic
Pain effects human animal
Associated systems & modeling

Biomechanics
Human studies

MWM
Transient change in bone position & Increase ROM
Initial non-opioid hypo-algesia: DPIS - PAG mediated?

Neurophysiologic
Pain effects human animal
Associated systems & modeling:
Sensory motor system

Biomechanics
Human studies

MWM

Transient change in bone position & Increase ROM
Mobilisation With Movement Effects on Joint Position Sense: Preliminary Studies
Saturday: 9.00 - 9:30  The role of MWM in ankle injuries
N=22
Recurrent ankle sprain
Deficit in Joint Position Error

Control
WB-MWM
NWB-MWM

Unpublished Hons Project
N=22
Recurrent ankle sprain
Deficit in Joint Position Error

Control
WB-MWM
NWB-MWM

Are these findings an expression of the ‘restoration of joint memory’ explanation provided by Mulligan?

23 subjects with LE and reduced shoulder external rotation pre-intervention.

MWM for LE reversed the deficit in shoulder rotation.

Interpreted as MWM induced changes in shoulder muscle tone implying neurophysiological effect
Initial non-opioid hypo-algesia: DPIS - PAG mediated? / Sensorimotor integration

NEUROPHYSIOLOGIC
Pain effects human animal
Associated systems & modeling: Sensory motor system

BIOMECHANICS
Human studies
MWM

Transient change in bone position & Increase ROM
Initial non-opioid hypoalgesia: DPIS - PAG mediated? / Sensorimotor integration

NEUROPHYSIOLOGIC
Pain effects human animal
Associated systems & modeling: Motor system

BIOMECHANICS
Human studies

MWM

Transient change in bone position & Increase ROM

N=25 (17 male; age: 46 years, range: 29-60) with unilateral LE (16 months: range 2-96)

Mean deficit in PFGS: 38.4 pounds of force

Mean difference pre to post application of MWM:
- Affected = 10.4 pounds
- Unaffected = -2.7 pounds
Initial non-opioid hypo-algesia: DPIS - PAG mediated? / Sensorimotor integration

NEUROPHYSIOLOGIC
Pain effects human animal
Associated systems & modeling: Motor system

BIOMECHANICS
Human studies

MWM

Transient change in bone position & Increase ROM
Specificity of application

Pain effects: human, animal
Associated systems & modeling

NEUROPHYSIOLOGIC

Initial non-opioid hypo-algesia: DPIS - PAG mediated?

BIOMECHANICS

Factors such as: Direction, Force, Velocity/Frequency, Technique, Localization

Human studies

MWM Specificity of application

Transient change in bone position & Increase ROM
Direction of force:


Lateral glide with 0 or 5° posterior inclination

NOT 5° anterior to direct lateral
McLean et al. 2002 A pilot study of manual force levels required to produce manipulation induced hypoalgesia. Clin Biom 17: 304-8
Specificity of application

Pain effects:
- Human
- Animal

Associated systems & modeling

NEUROPHYSIOLOGIC

Initial non-opioid hypo-algesia: DPIS-PAG mediated?

BIOMECHANICS

Human studies

- MWM
- Transient change in bone position & Increase ROM

Direction:
- Force level
- Frequency
- Technique
- Localization?

Transient change in bone position & Increase ROM

Direction: Force level Frequency Technique Localization?
Specificity of application

Pain effects

Initial non-opioid hypo-algesia: DPIS -PAG mediated?

Associated systems & modeling

NEUROPHYSIOLOGIC

Pain effects human animal

Direction Force level Frequency Technique Localization?

Adequate stimulus?

BIOMECHANICS

Human studies

MWM Specificity of application

Transient change in bone position & Increase ROM

Adequate stimulus?
Complex multifaceted

- Total MIA effect
- Supraspinal inhibition
- Segmental inhibition
- Psychological effects
- Nociceptor effects
- Joint repair
- Treatment application
- Time

Wright (1995)
Pre-existing beliefs:
- Injury & damage
- Catastrophisation
- Fear-avoidance

Expectations:
- Placebo
- Practitioner
- Treatments

Chronic pain = conditioned (learned) phenomenon (Zusman 2004)

MWM = a re-conditioning of a pain-movement association - possibly through non-associative learning theory mechanism (Zusman 2004)
Repetition seems to be critical in successful treatment!

Chronic pain = conditioned (learned) phenomenon (Zusman 2004)

MWM = a re-conditioning of a pain-movement association - [possibly through non-associative learning theory mechanism (Zusman 2004)]
MWM Specificity of application

Human studies

Initial non-opioid hypo-algesia: DPIS-PAG mediated?

Direction
Force level
Frequency
Technique
Localization?

NEUROPHYSIOLOGIC

BIOMECHANICS

Transient change in bone position
Increase ROM

Adequate stimulus

Associated systems & modeling

Pain effects human & animal

Adequate stimulus?