

Spinal mobilisation and manipulation

The art, mechanisms and
effects.

Perspective from a clinician

WTF



Conclusion !

Manipulation has many “faces”, most are performed without pain and are impulse depended.

One of many ways to reduce pain and restoring pain free movement

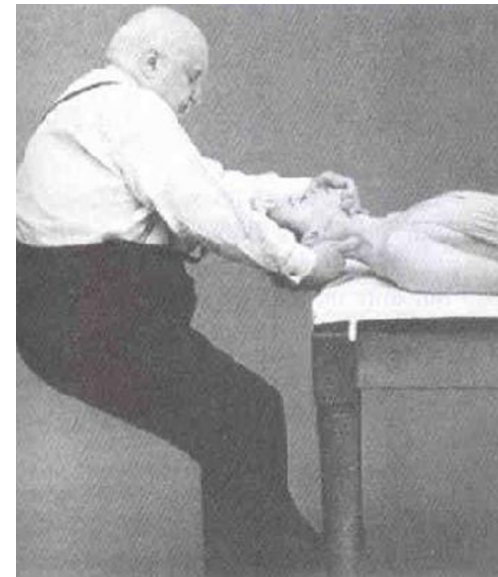
Pain modulation via Spinal, Segmental and Central de sensitivity of nociceptive neurons

Subgrouping important in succeeding

Cavitation not necessary (but nice)

Adverse events - present yes, bus safe to manipulate if you take precautions.

Future scope - Bright but the ability to handle is critical



Recommendations

The evidence is not overwhelming

Manipulation is safe to perform on chronic low back pain and is as effective as other common treatments prescribed for CLBP.

SM Rubinstein 2011 (Cochrane)

Manipulation is safe to perform on acute low back pain (< 6 weeks) but no more effective than other treatment or Sham.

SM Rubinstein 2012 (Cochrane)

Manipulative therapy has a clinical relevant effect on pain, no difference in professions performing manipulation. Reduces pain in musculoskeletal disorders compared to Sham (Low back pain and Neck pain). Clinicians can refer patients for manipulative therapy to reduce pain thus most effective on short term.

Gwendolijne GM Scholten-Peeters 2013 (Review)

On Acute, subacute and chronic neck pain multiple sessions of cervical manipulations provide better pain relief than certain medications, massage, TENS.

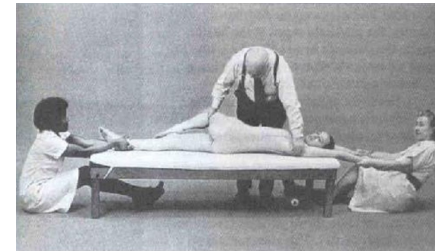
Multiple sessions of neck manipulation to patients with cervicogenic headache is more effective than massage on pain and function.

Risk of adverse events identified

Gross et al 2015 (review)

Manipulation is more effective on pain than Sham on NLBP. (Small number of qualities)

Ruddock 2016 (Review)



The Thing is!

Patient content to SMT

Adverse event

Lack of data

Loosing a way



Christopher Mcarthy

Considerations

David Evans 2017

“I think the problem is primarily due to our current inability to subgroup back pain. This is the 'old chestnut' that won't go away. I think further evidence for this is that, anecdotally at least, many patients that *do* improve after receiving spinal manipulation do so very rapidly and very dramatically (most pain disappears very quickly). Thus, the small to moderate effect is an artefact of averaging results across heterogenous groups.”



David Evans

How to choose the right patient

Subgrouping

Douglas P. Gross et al 2015 Scoping Review - 123 articles with 43 Clinical Decision Support tools (CDS) in treating patients with musculoskeletal disorders.

Computer based tools - Questionnaires

Treatment algorithms / treatment based classifications

Clinical prediction tools

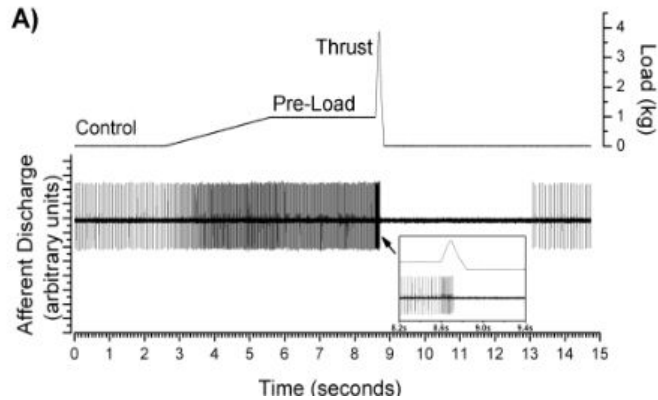
Rules developed empirically and theoretically

All are still preliminary and difficult to validate in clinical trials



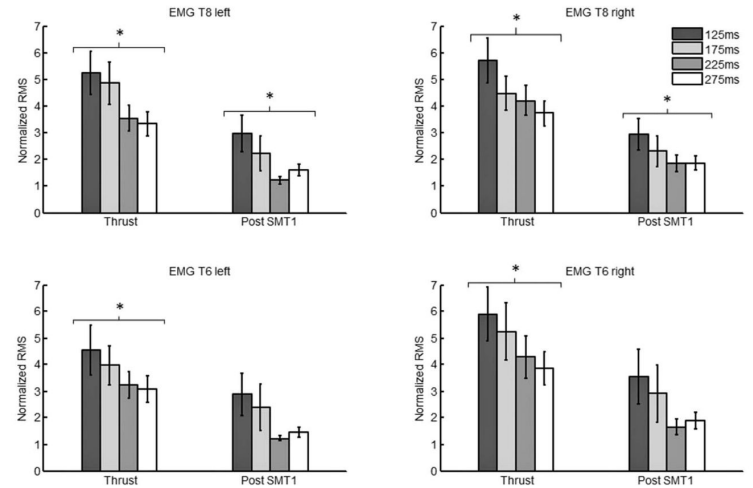
The effect

Discharge of afferents can be evoked



PICAR 2012

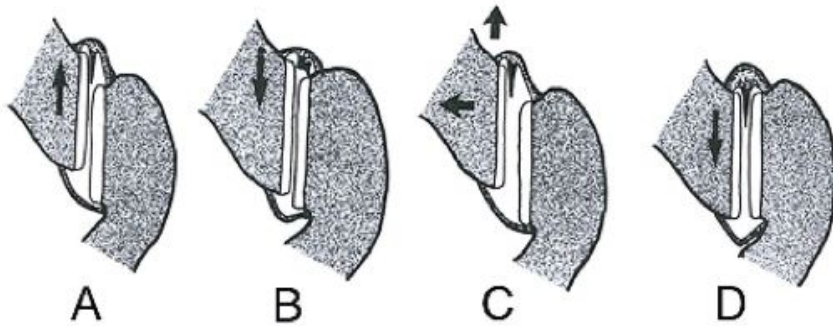
Changes i EMG responses post SMT
- Impulse does matter



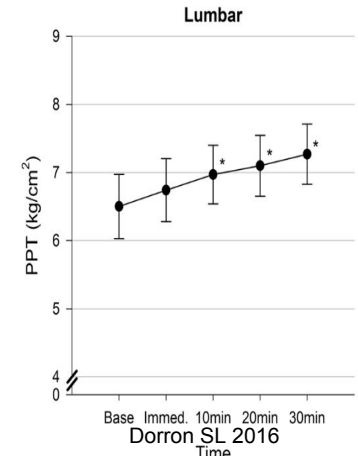
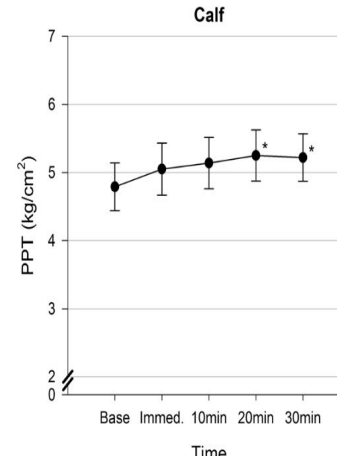
Page 1 2014

The effect

Biomechanical changes modulate paravertebral sensory neuron signals - change of environment



Picar 2002, 2012, Evans 2010



Dorron SL 2016

The effect

Descending inhibitory pain mechanism

Periaqueductal Gray Region → Dorsal horn (Noradrenalin increase nociceptive mechanical thresholds and Serotonin increase thermal thresholds)

Savva C et al 2014

Neurotensin (Vasodilation), oxytocin (The Hug hormone, increase in metabolism), and cortisol (stress or physical training) blood levels.
(Descending)

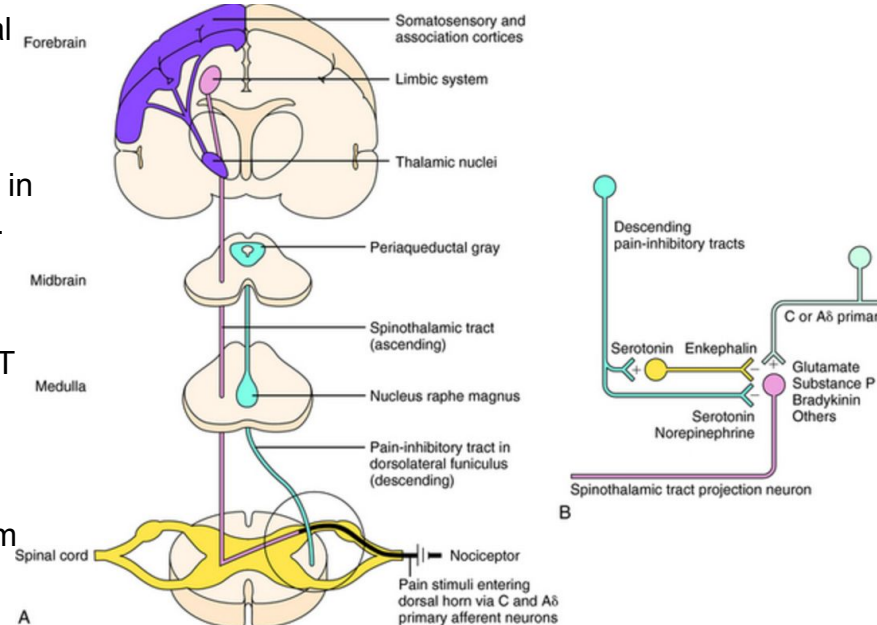
Gustavo PM 2014

Changes in nociceptive specific lateral thalamic neurons after SMT
(Descending)

Reed RW 2014

SMT showed a significant change (increased) in remote sites of stimulus application - Possible Central nervous system mechanism
(Descending)

Coronado CA 2012



To put things in perspective



“Even more notable and dubious are the immediate effects findings of improved active mouth opening after hamstring stretching, improved hamstring mobility after suboccipital stretching, and improved spatial cognitive tasking after breathing through the left nostril only”.

Cook 2011

Mechanical considerations

What are we trying to accomplish when performing a manipulation.

“Cracking” = Tribonucleation. The formation of bubbles. Kawchuk GN 2014

Tribonucleation is created by traction or force applied perpendicular to joint surfaces. Evans 2010

Joint gapping is larger when performing SMT when “Cracking” sound occurs. Cramer GD 2012

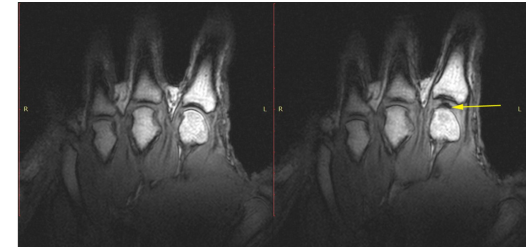


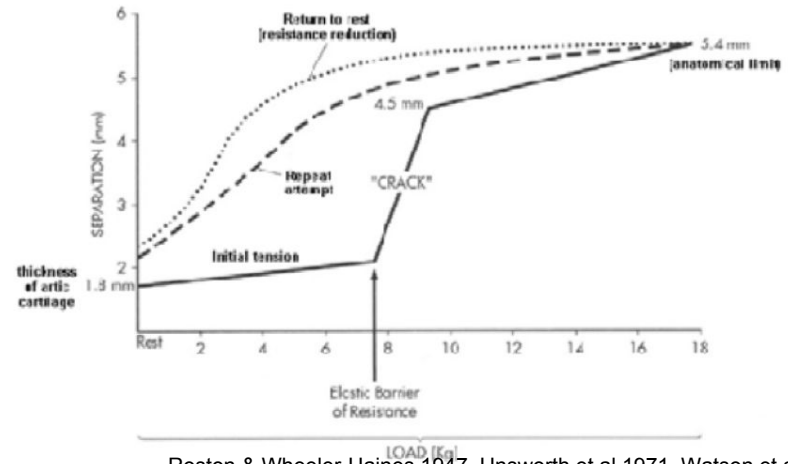
Fig. 2. T1 static images of the hand in the resting phase before cracking (left). The same hand following cracking with the addition of a post-cracking distraction force (right). Note the dark, interarticular void (yellow arrow).

Mechanical considerations

Does the “cracking” matter ???

The impulsive thrust may alter segmental biomechanics by releasing trapped meniscoids, releasing adhesions, or by diminishing distortion in the intervertebral disc. Picar 2012

Impulse and preloading a specific area prior to manipulation impulse generates greater effect on muscle spindle response after SMT. Reed WR. 2014



Adverse Events

Safe if we take precautions

- Many reports on soreness / pain < 24 hr.
- Postgraduates training manipulative therapy 30-40% reported adverse events. - 21% longer lasting effects. M. Thoomes-de Graaf 2017
- Few cauda equina reported. Herbert JJ et al 2015
- Stroke is rare but can occur after manipulative neck treatment if signs prior to stroke are overlooked. Cassidy JD 2016



Adverse Events

Safe if we take precautions

- IFOMPT Screening Cervical Framework
- National Clinical guideline
-
- Trauma / Red Flags
- CAD/VBI/instability
- Radiculopathy / signs of Neurological influence
- Patients preference
- Features does not fit
- Inadequate examination



Adverse Events

Safe if we take precautions

IFOMPT Screening Cervical Framework Risk Factors

Past history of trauma to the cervical spine/vessels A history of migraine
Hypertension
Hypercholesterolemia/hyperlipidemia

Cardiac disease, vascular disease, previous cerebrovascular accident or transient ischaemic attack Diabetes mellitus
Blood clotting disorders/alterations in blood properties (anticoagulant therapy)
Long term use of steroids

History of smoking
Recent infection
Immediately postpartum
Trivial head or neck trauma
Absence of plausible mechanical explanation for your symptoms History of trauma (e.g. whiplash, rugby neck injury)

Throat infection
Congenital collagenous compromise Inflammatory arthritides
Recent neck/head/dental surgery Osteoporosis/osteopenia
Structural instability



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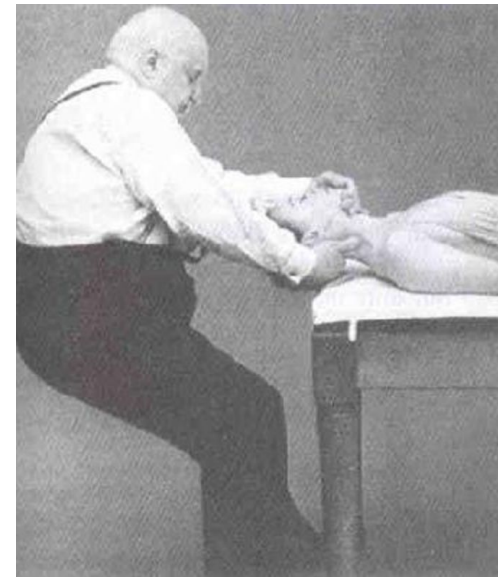
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Litteratur

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