Modulating Pain with Thrust Manipulation: *The Big, The Small, How to Tackle Them All*

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... Over a span of 75 years, my father, the late James Mennell MD, and I have tried to encourage the use of manipulative therapeutic techniques ... to allow the painless restoration of functional movements very readily and comfortably... “

1984 letter to the Journal of the Royal Society of Medicine, Dr. John McM. Mennell

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... I encourage you to teach others well and modify as necessary for the individual practitioner so these techniques are safe and comfortable, and so even the small therapist with small hands can do them well.

1984 letter to the Journal of the Royal Society of Medicine, Dr. John McM. Mennell

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1916-1992

John McM. Mennell, MD
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Manipulation - Modulating pain

- Spinal manipulation, one of the oldest forms of therapy for back pain
- There has been an escalation of clinical and basic science research on manipulative therapy, which has shown that there is a scientific basis for the treatment of back pain by manipulation. Kirkaldy-Willis & Cassidy 1985
- A significant effect of spinal manipulation on increasing pain pressure threshold at the remote sites of stimulus application supporting a potential central nervous system mechanism. Changes in pain sensitivity following spinal manipulation: a systematic review and meta-analysis. Coronado, Bialosky et al. 2012

Manipulation - Clinical utilization?

Review of systematic reviews 1980-2011 of spinal manipulation (SM)
- DC, DO and PTs are most likely to deliver SM, often in conjunction with other conservative therapies
- Back and neck pain were the most frequent indications for SM
- Patient satisfaction with SM is high


87% of PTS felt academically prepared to utilize manipulation in the clinical setting
Low utilization in clinical internships by PTS
- 50% reported some utilization of spinal manip; peripheral manipulation essentially zero
  If utilized
- 74% utilized manipulation if CI used manips
- 28% utilized manipulation if CI didn’t use manips

Sharma & Sabus (2012) N=48 surveys

“I was successful with manipulation on my lab partners in PT school.... but I am unable to successfully translate that skill to my patient population in the clinic.”

“It hurts my hand to do thoracic manips, so I only do them on small patients.”
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Manipulation – doing it well

Components
• Preload force
• Time to peak force
• Peak force
• General arm-body coordination
• Consistency

Errors
• Inaccurate moments (vectors)
• Too low preload force
• Too long to peak force
• Reduced pre-load force before peak force = “back off barrier”
• Too high/low peak force


Training (chiropractic students)
• Prone thoracic manipulation – instructor & practice versus instruction & practice on manikin with feedback for 5 weeks
• Manikin group - significant improvements compared to other group
  • Decreased peak load variability (p 0.024)
  • Increased preload force (p <0.001)

Descarreaux 2006

Training (PT students EWU)
• Supine thoracic manipulation
  • Compared experienced manual therapists to PTS
  • CPR-like mannequin equipped with an accelerometer to measure acceleration delivered during the manipulation
  • They hypothesized higher peak acceleration and less variation in peak acceleration among experienced PTs.
    • PTS n = 22 Experienced PTs n = 15
    • PTs had significantly higher acceleration

HaB, Coleman & Keenan APTA CSM poster 2014

Manipulation – skill development

Skilled clinical interventions involve domains of cognitive, affective and psychomotor concepts.
• 8 homogenous skill sets associated with OMPT proficiency:
  • Manual joint assessment
  • Proficiency of fine sensorimotor characteristics
  • Manual patient management
  • Bilateral hand-eye coordination
  • Manual gross characteristics of upper extremity
  • Manual gross characteristics of lower extremity
  • Control of self and patient movement
  • Discriminate touch

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Manipulation – skill development

8 homogenous skill sets with 29 stand-alone skills associated with OMPT proficiency,

In the top 20:
- Joint mobility testing
- Soft tissue assessment
- Skill in performing mobilization – manipulation
- Perception of resistance to movement
- Clinician’s control of force & pressure
- Clinician’s coordination
- Manual dexterity & movement patterns of upper limb


Manipulation – skill development

In the top 20:
- Body mechanics
- Patient handling & control of push-pull
- Clinician’s contact while producing stabilization & motion
- Eye-hand coordination & ambidexterity
- Clinician’s lower extremity movement patterns and balance
- Clinician’s control of own weight shift
- Clinician’s control of patient movements
- Effective and discriminate touch


Manipulation – skill development

The challenge is then to apply the cognitive and psychomotor theories to the skills necessary to make a successful manipulation

Manipulation - Clinical utilization?

What goes wrong?
- Practitioner too small &/or patient too large
- Practitioner’s physical limitations that limit effective delivery
- Practitioner inexperience with selected technique

Gibbons & Tehan, 2009
Molloy, personal 2010
Manipulation - Clinical utilization?

- **What goes wrong?**
- Bed – too high
- Patient – too far away
- Trying to manipulate with fingers and wrists
- Using small or slow muscles
- Lack of core control/stability
- Feet or center of force facing wrong direction!


Technique Tips: Speed Drills

- Practice, practice, practice the psychomotor skills
- Toilet Paper
  - Rip off one piece of the roll at a time
- Bananas
  - Snap banana in half (with peel still on!)
- “Air-manip”
  - Etc………..

O’Grady W

Disclaimer

- Typically manipulation is applied to the hypomobile, non-irritable joints.
- All techniques must be preceded by
  - A detailed history, medical screening, red flag screening and risk analysis.
  - Risk analysis of potential hyper-sensitive or fragile joints or soft tissue
  - A pre-manipulative hold or pause
  - Patient/client verbal consent

Technique Tips: elbow – elbow

Lumbar Spine
Most of work done through your arms (elbows/forearms)
- Stand TALL
- Compress
- Vector to the joint
- Use towel roll/bed to facilitate flexion/opening technique

Hoke
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Technique Tips: Roll patient/sacrum towards you – don’t manip “uphill”

Technique Tips: and you don’t need to look at it!

Technique Tips – use gravity

Lumbar extension – closing technique
• Use the bed to your advantage
• Use gravity

Technique Tips

CT Junction Technique
• If you cannot get your arms to the back of their lower neck — then grasp onto their forearms but be careful to grip across and/or support their wrists
• Squeeze their thorax and avoid cervical flexion
Technique Tips

CT Junction Technique
- If the seated technique is not possible - then trying it in supine
- Use lumbrical grip to thoracic laminae and transverse processes
- Traction is a quick shoulder extension action

Technique Tips

Upper thoracic
- Patient assists with a hip/bridge lift which will provide better upper thoracic transverse process contact and easier to generate a pre-manip loading force

Technique tips – supine thoracic

Protected hand positions
- Use "tripod" posture hand (tight flexion of digits 3,4,5, extension thumb & index +/- roll to protect PIPs)
- Contact on their TPs with opposed thenar eminence & 3rd PIP
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Technique tips – appropriate distance

Protect your zyphoid and ribs – make sure contact is in the central of your sternum
And/or towel or pillow separation

Technique tips: Thoracic supine

Supine technique – Pt’s elbow covered by PT hand to Pt’s lower sternum
PT line of gravity over segment – aim for the segment

Technique tips: Thoracic supine

Alternate technique for larger patient/smaller PT and less anterior chest contact
AVOID hyperextending the thoracic segment!

Technique Tips: Thoracic ¾ supine

If patient’s back is broader than your arm – use a ¾ turn and a prop, i.e. a wedge to bring the bed closer to your posterior wrist.
The manip force is through their elbows and chest to the posterior thoracic contact point

Hoke adapted from Lee
Technique tips: thoracic - seated

Use towel to distance & focus forces – avoids frontal contact

Technique tips: hip traction with assistant

Stabilize patient’s pelvis with assistant or belts

Technique tips: correction of plantar cuboid on calcaneus

“Horseshoeing” position or prone on table

Avoids full ankle plantar flexion – as often this cuboid dysfunction is associated with anterior ankle laxity

Technique Tips – “gumby”

Patient is Hypermobile:
• Need to take ALL the slack out of the levers to focus your forces
• Utilize Fryette’s laws
• Utilize the table, rolls, wedges etc.
• Take up rotation – last
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In Summary… take home

• Size up your patient
• Apply physics/vectors
• Facilitate your fast and large muscles
• Stop thinking … just go with the movement
• Time your breathing
• …and stand tall

Resources

• O’Grady W., Puentedura E. “The practical guide of safe and effective thrust manipulation” 2015 in press

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