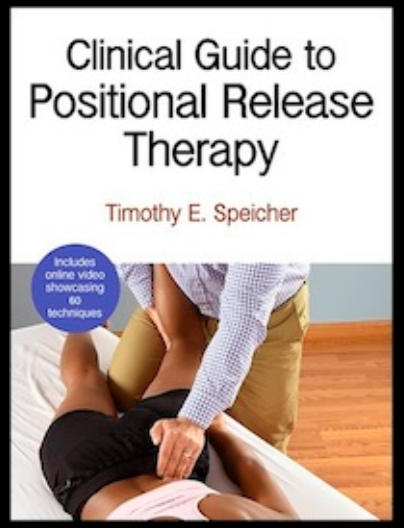
PRTi

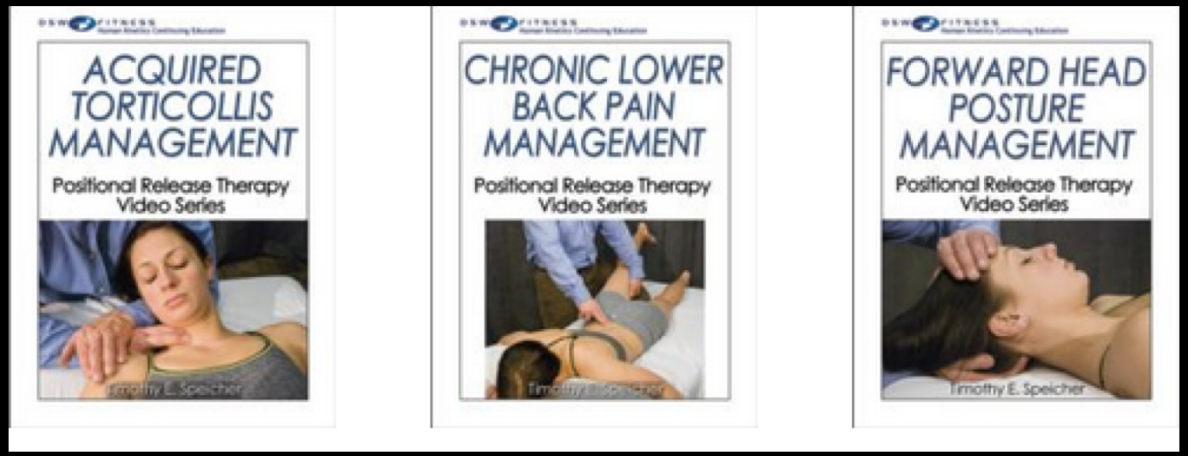
POSITIONAL RELEASE THERAPY INSTITUTE

Positional Release Therapy: An Evidence Based Review

DISCLOSURE

The Positional Release Therapy Institute is a company that provides continuing education and certification in Positional Release Therapy. Online courses and instructional videos are also associated with the instruction provided by the Institute.





LEARNING OBJECTIVES

- Recall supporting evidence for the application of PRT
- Recall 5 clinical implications and contraindications of PRT
- Identify how PRT is integrated into an overall treatment plan

WHAT IS PRT?

- An Indirect Approach
  - Non-painful
  - Moving away from resistance barrier
    - Body/Tissue Positioning
  - Use of Tender points (TPs)
    - vs. Trigger points (TrPs)
- *Unkinking* the Chain
  - = Functional restoration
- Direct Approach
  - Pushing through resistance barrier

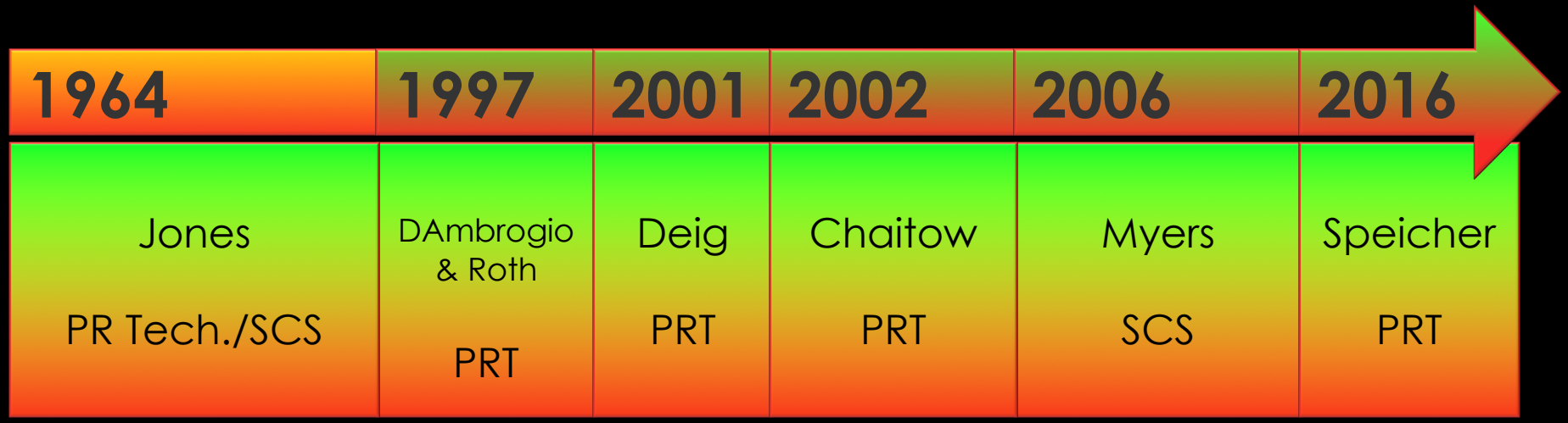
Strain Counterstrain (SCS)

- Segmental
- Assess TPs/MTrPs during positioning
- Position held for 90 seconds
- May or may not monitor tissue lesion
- May or may not apply joint manipulation
- May or may not apply fascial manipulation

Positional Release Therapy (PRT)

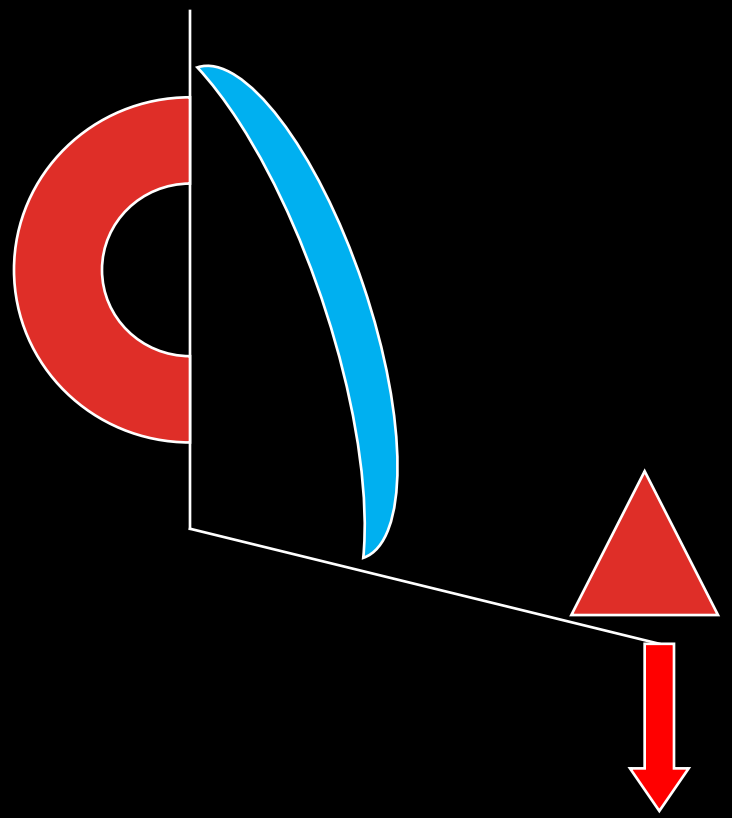
- Whole Body
- Utilizes FRM© (Fasciculatory Response Method©) for assessment & treatment
- Position held until fasciculation subsides
- Joint & fascial manipulation attempted

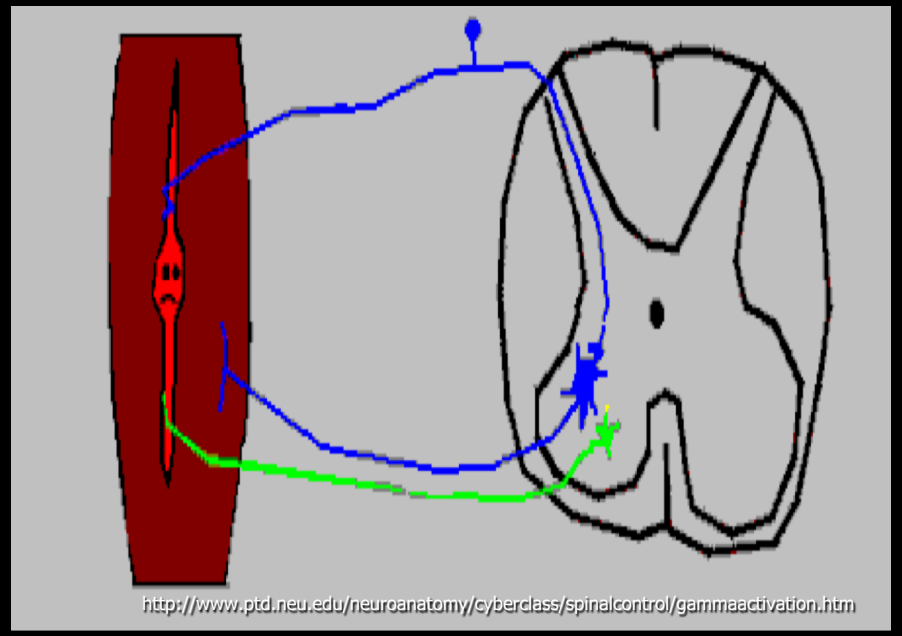
PRT HISTORICAL TIMELINE



SCS THEORY (JONES, 1973)

- Strain = Counterstrain = spindle dysfunction
  - Maybe





SOMATIC DYSFUNCTION THEORIES

- Somatic Dysfunction (Korr, 1947)
- Proprioceptive Theory (Korr, 1975)
- ATP Energy Crisis (McPartland, 2004)
- Integrated Trigger Point Hypothesis (Gerwin et al., 2004)
- Mechanical Coupling Theory (Speicher, 2006 & 2016)

SOMATIC DYSFUNCTION

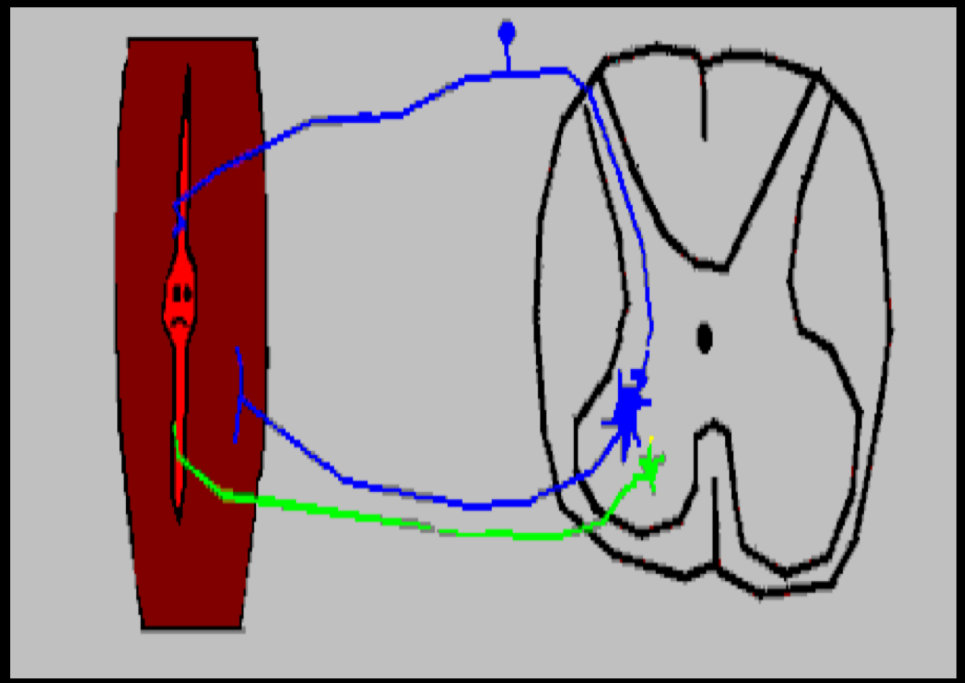
Osteopathic Lesions (Korr, 1947, 191):

- Trigger Points (TrPs) and Tender Points (TPs)

1. Hyperesthesia of the muscles and vertebrae
2. Hyperirritability, reflected in altered muscular activity and altered states of muscular contraction
3. Changes in the tissue texture of muscle, connective tissue [fascia], and skin
4. Changes in local circulation and in the exchange between blood and tissues
5. Altered visceral and other autonomic functions

PROPRIOCEPTIVE THEORY (KORR, 1975)

- Sustained Stretch Reflex
  - Howell et al. (2006)
  - Wynne et al. (2006)
- Increased Gamma Gain
  - Appelberg et al. (1983)
  - Capra et al. (2007)
  - Thunberg et al. (2002)

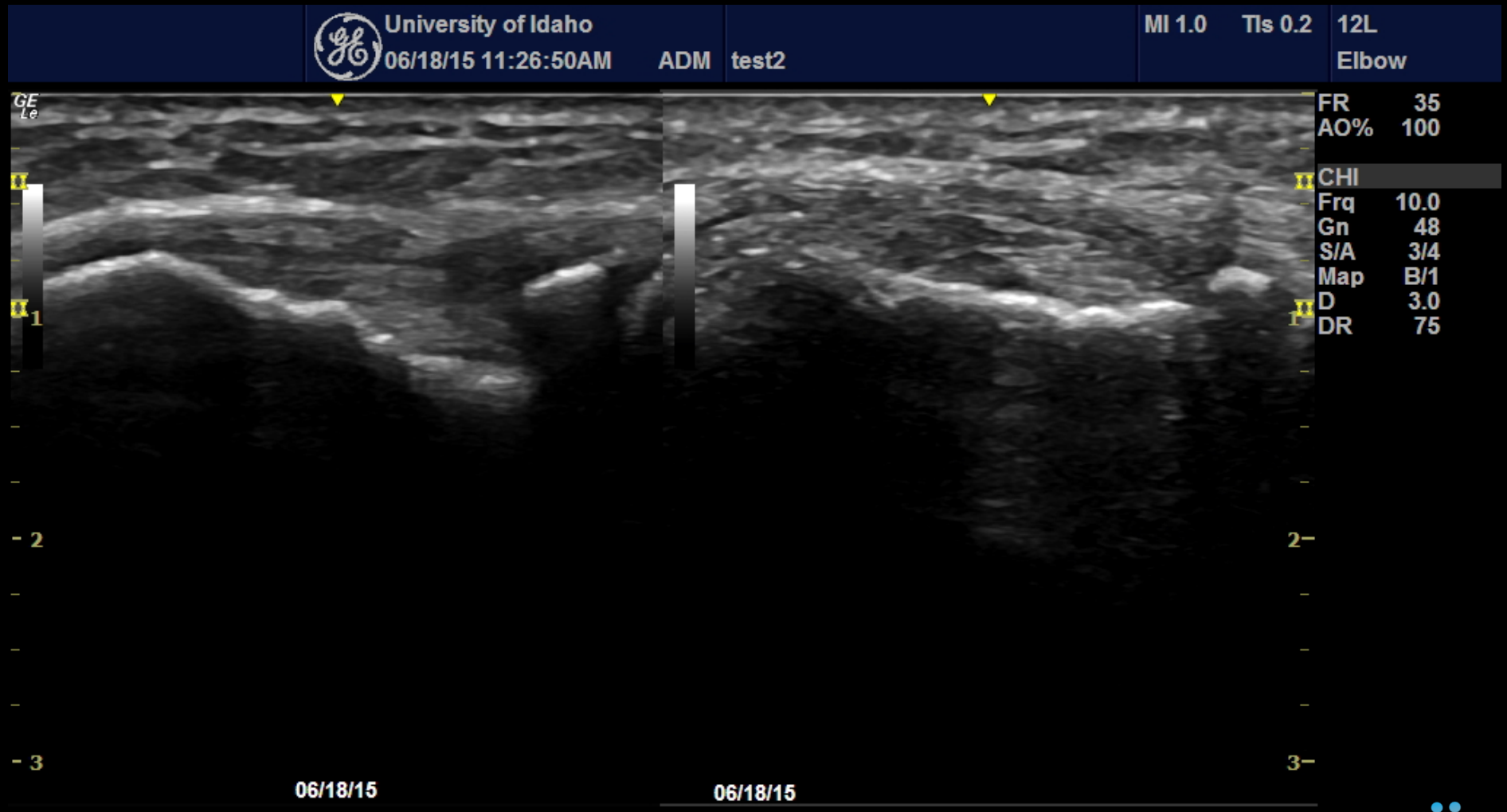


http://www.ptd.neu.edu/neuroanatomy/cyberclass/spinalcontrol/gammaactivation.htm

ATP Energy Crisis (McPartland, 2004)

- Energy supply limited
  - Hypoxia ↑ release of ACh
  - ↑ ACh and diminished breakdown = sustained contraction
- ↓ Perfusion
  - Larsson et al. (1999)
  - Maekawa et al. (2002)
  - Gerwin et al. (2004)
  - Rosas-Ballina et al. (2011)

LATERAL ELBOW TENDINOPATHY

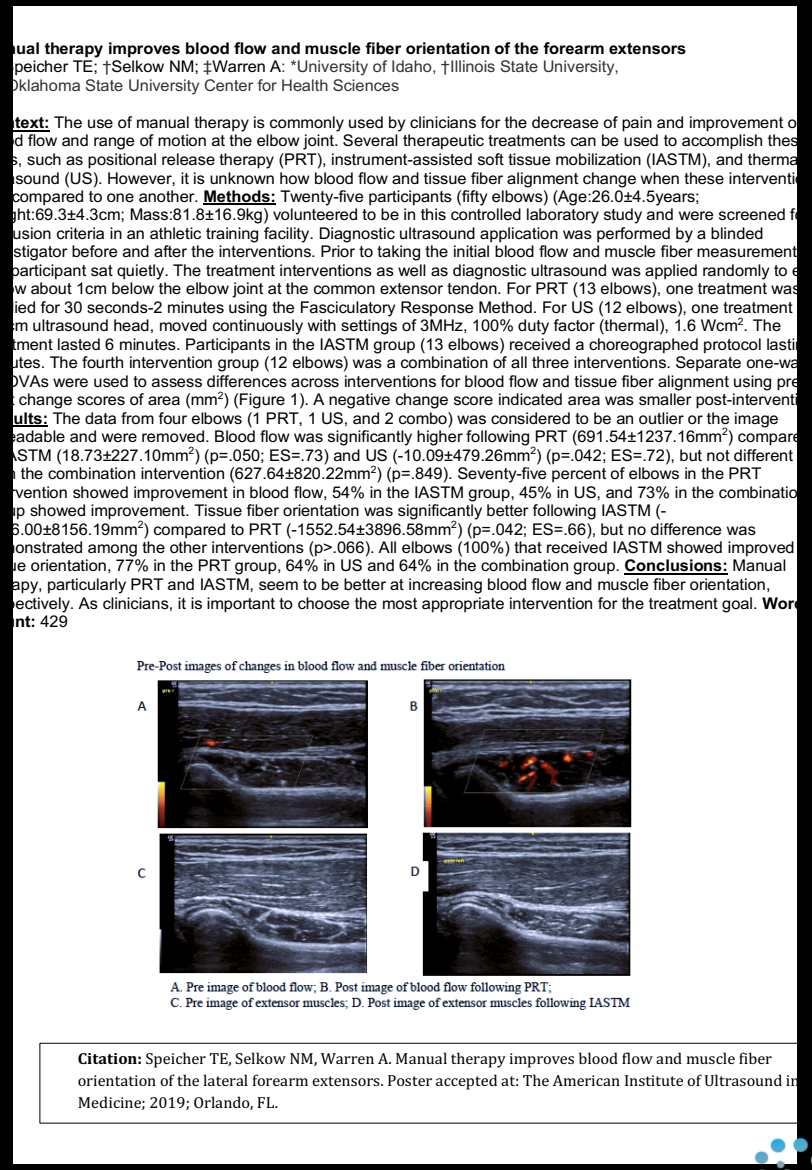


Pre- PRT Release

Post- PRT Release

BLOOD FLOW & TISSUE REORGANIZATION

- RCT
  - Assessor Blinded (Diagnostic Ultrasound)
  - 25 Subjects (50 Elbows)
- Groups
  - PRT
  - Ultrasound (Thermal)
  - IASTM
  - Combination
- Results:
  - Increased Blood Flow
    - PRT vs IASTM (p = .050)
    - PRT vs US (p = .047)
  - Increased Tissue Reorganization
    - IASTM vs. PRT (p = .042)



ual therapy improves blood flow and muscle fiber orientation of the forearm extensors

peicher TE; †Selkow NM; ‡Warren A: *University of Idaho, †Illinois State University, Oklahoma State University Center for Health Sciences

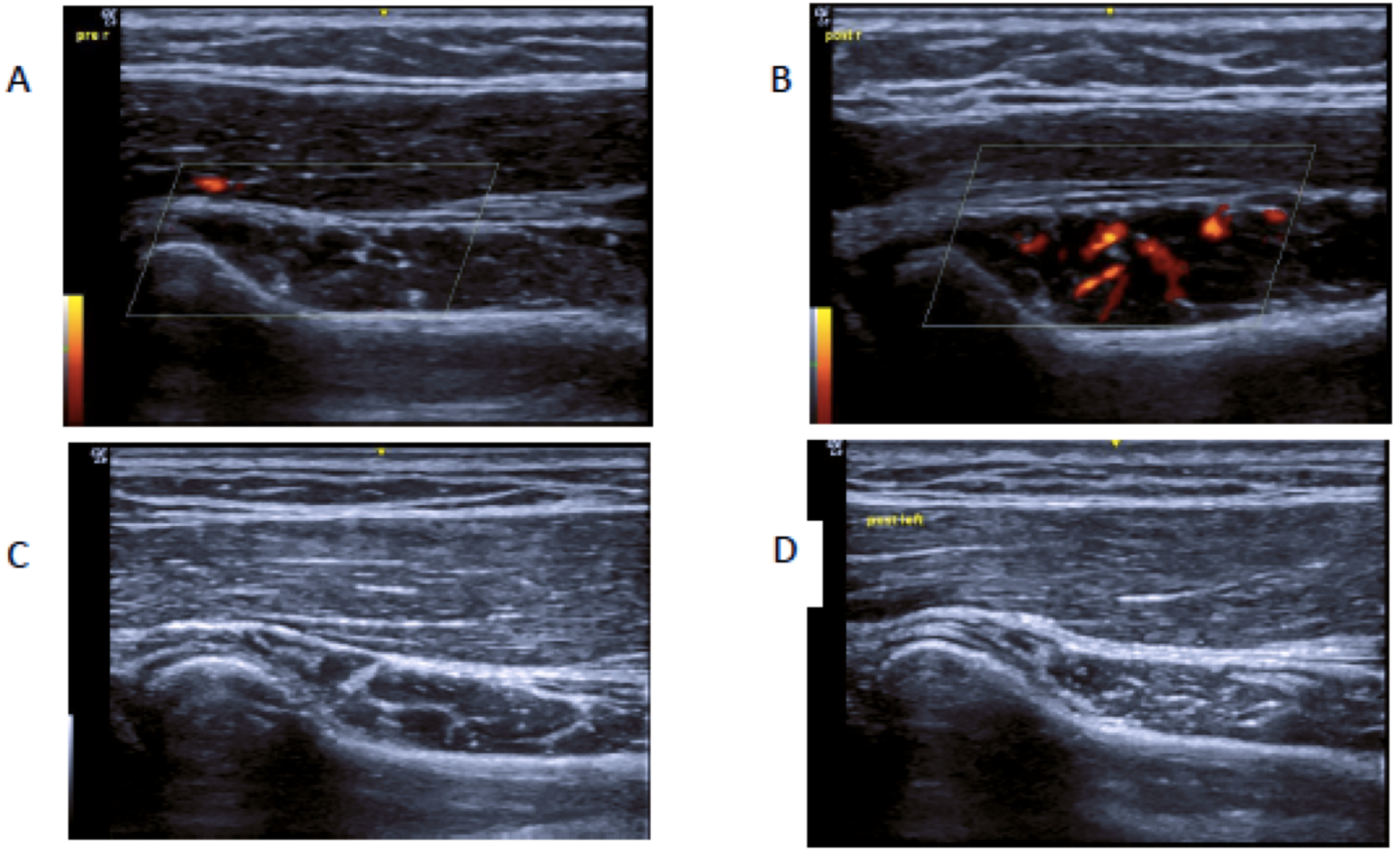
text: The use of manual therapy is commonly used by clinicians for the decrease of pain and improvement o d flow and range of motion at the elbow joint. Several therapeutic treatments can be used to accomplish thes s, such as positional release therapy (PRT), instrument-assisted soft tissue mobilization (IASTM), and therma sound (US). However, it is unknown how blood flow and tissue fiber alignment change when these interventi compared to one another. **Methods:** Twenty-five participants (fifty elbows) (Age:26.0±4.5years; ght:69.3±4.3cm; Mass:81.8±16.9kg) volunteered to be in this controlled laboratory study and were screened f usion criteria in an athletic training facility. Diagnostic ultrasound application was performed by a blinded stigator before and after the interventions. Prior to taking the initial blood flow and muscle fiber measurement participant sat quietly. The treatment interventions as well as diagnostic ultrasound was applied randomly to e w about 1cm below the elbow joint at the common extensor tendon. For PRT (13 elbows), one treatment was ied for 30 seconds-2 minutes using the Fasciculatory Response Method. For US (12 elbows), one treatment m ultrasound head, moved continuously with settings of 3MHz, 100% duty factor (thermal), 1.6 Wcm^2. The tment lasted 6 minutes. Participants in the IASTM group (13 elbows) received a choreographed protocol lasti utes. The fourth intervention group (12 elbows) was a combination of all three interventions. Separate one-wa OVAs were used to assess differences across interventions for blood flow and tissue fiber alignment using pre change scores of area (mm^2) (Figure 1). A negative change score indicated area was smaller post-interventi **ults:** The data from four elbows (1 PRT, 1 US, and 2 combo) was considered to be an outlier or the image eadable and were removed. Blood flow was significantly higher following PRT (691.54±1237.16mm^2) compare ASTM (18.73±227.10mm^2) (p=.050; ES=.73) and US (-10.09±479.26mm^2) (p=.042; ES=.72), but not different the combination intervention (627.64±820.22mm^2) (p=.849). Seventy-five percent of elbows in the PRT rvention showed improvement in blood flow, 54% in the IASTM group, 45% in US, and 73% in the combinatio p showed improvement. Tissue fiber orientation was significantly better following IASTM (-6.00±8156.19mm^2) compared to PRT (-1552.54±3896.58mm^2) (p=.042; ES=.66), but no difference was onstrated among the other interventions (p>.066). All elbows (100%) that received IASTM showed improved ue orientation, 77% in the PRT group, 64% in US and 64% in the combination group. **Conclusions:** Manual apy, particularly PRT and IASTM, seem to be better at increasing blood flow and muscle fiber orientation, ectively. As clinicians, it is important to choose the most appropriate intervention for the treatment goal. **Wor nt:** 429

Pre-Post images of changes in blood flow and muscle fiber orientation

A. Pre image of blood flow; B. Post image of blood flow following PRT;
C. Pre image of extensor muscles; D. Post image of extensor muscles following IASTM

Citation: Speicher TE, Selkow NM, Warren A. Manual therapy improves blood flow and muscle fiber orientation of the lateral forearm extensors. Poster accepted at: The American Institute of Ultrasound in Medicine; 2019; Orlando, FL.

Pre-Post images of changes in blood flow and muscle fiber orientation



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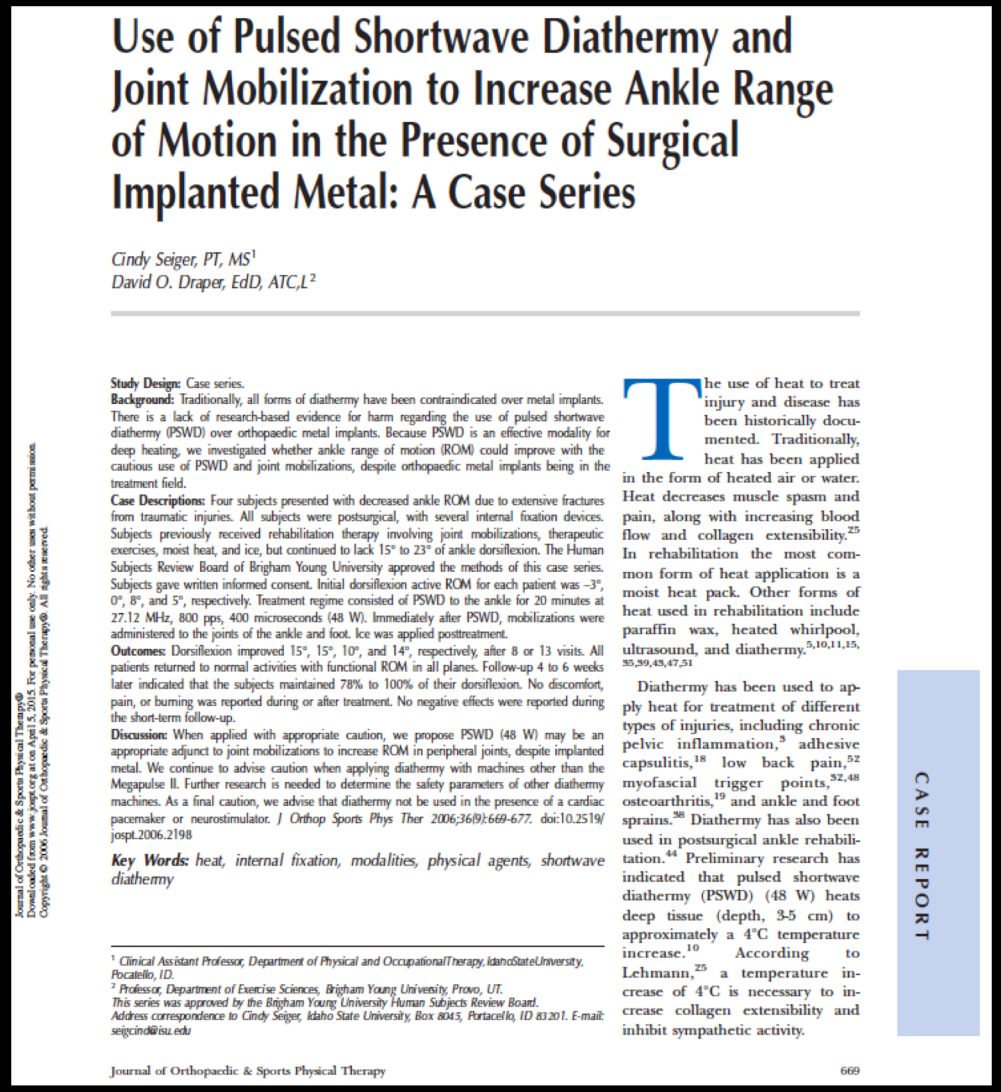
CONVENTIONAL & MANUAL THERAPY INTEGRATED

- Intervention: PSWD 27.12 MHz, 800 pps, 400 microseconds (48 W) for 20 min. followed by joint mobilization (Maitland Grade III-IV & static glides) .
- ↑Active ankle dorsiflexion 10-15 deg. (immediate and maintained ~1 month later)
- Why was diathermy prior to joint mobilizations effective for increasing AROM when other therapies had failed?



Use of Pulsed Shortwave Diathermy and Joint Mobilization to Increase Ankle Range of Motion in the Presence of Surgical Implanted Metal: A Case Series

Cindy Seiger, PT, MS[1]
David O. Draper, EdD, ATC,L[2]

Study Design: Case series.
Background: Traditionally, all forms of diathermy have been contraindicated over metal implants. There is a lack of research-based evidence for harm regarding the use of pulsed shortwave diathermy (PSWD) over orthopaedic metal implants. Because PSWD is an effective modality for deep heating, we investigated whether ankle range of motion (ROM) could improve with the cautious use of PSWD and joint mobilizations, despite orthopaedic metal implants being in the treatment field.
Case Descriptions: Four subjects presented with decreased ankle ROM due to extensive fractures from traumatic injuries. All subjects were postsurgical, with several internal fixation devices. Subjects previously received rehabilitation therapy involving joint mobilizations, therapeutic exercises, moist heat, and ice, but continued to lack 15° to 23° of ankle dorsiflexion. The Human Subjects Review Board of Brigham Young University approved the methods of this case series. Subjects gave written informed consent. Initial dorsiflexion active ROM for each patient was –3°, 0°, 8°, and 5°, respectively. Treatment regime consisted of PSWD to the ankle for 20 minutes at 27.12 MHz, 800 pps, 400 microseconds (48 W). Immediately after PSWD, mobilizations were administered to the joints of the ankle and foot. Ice was applied posttreatment.
Outcomes: Dorsiflexion improved 15°, 15°, 10°, and 14°, respectively, after 8 or 13 visits. All patients returned to normal activities with functional ROM in all planes. Follow-up 4 to 6 weeks later indicated that the subjects maintained 78% to 100% of their dorsiflexion. No discomfort, pain, or burning was reported during or after treatment. No negative effects were reported during the short-term follow-up.
Discussion: When applied with appropriate caution, we propose PSWD (48 W) may be an appropriate adjunct to joint mobilizations to increase ROM in peripheral joints, despite implanted metal. We continue to advise caution when applying diathermy with machines other than the Megapulse II. Further research is needed to determine the safety parameters of other diathermy machines. As a final caution, we advise that diathermy not be used in the presence of a cardiac pacemaker or neurostimulator. *J Orthop Sports Phys Ther 2006;36(9):669-677.* doi:10.2519/jospt.2006.2198

Key Words: *heat, internal fixation, modalities, physical agents, shortwave diathermy*

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This series was approved by the Brigham Young University Human Subjects Review Board.
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The use of heat to treat injury and disease has been historically documented. Traditionally, heat has been applied in the form of heated air or water. Heat decreases muscle spasm and pain, along with increasing blood flow and collagen extensibility.[25] In rehabilitation the most common form of heat application is a moist heat pack. Other forms of heat used in rehabilitation include paraffin wax, heated whirlpool, ultrasound, and diathermy.[5,10,11,15,35,39,43,47,51]

Diathermy has been used to apply heat for treatment of different types of injuries, including chronic pelvic inflammation,[3] adhesive capsulitis,[18] low back pain,[52] myofascial trigger points,[32,48] osteoarthritis,[19] and ankle and foot sprains.[38] Diathermy has also been used in postsurgical ankle rehabilitation.[44] Preliminary research has indicated that pulsed shortwave diathermy (PSWD) (48 W) heats deep tissue (depth, 3-5 cm) to approximately a 4°C temperature increase.[10] According to Lehmann,[25] a temperature increase of 4°C is necessary to increase collagen extensibility and inhibit sympathetic activity.

CASE REPORT

Seiger C, Draper DO. Use of pulsed shortwave diathermy and joint mobilization to increase ankle range of motion in the presence of surgical implanted metal: a case series. Journal of Orthopaedic & Sports Physical Therapy. 2006;36(9):669-677.

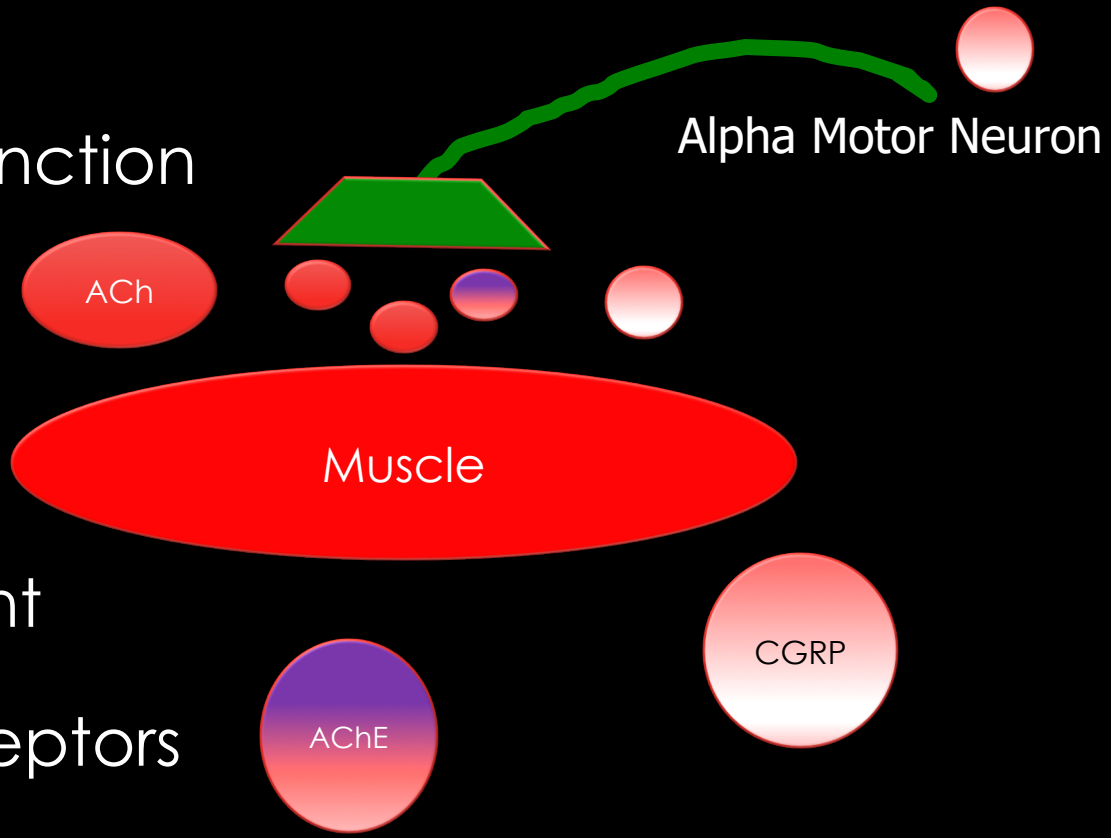
PRTi

ATP Energy Crisis (McPartland, 2004)

- Pathophysiological Nociceptive Model (Johansson & Sojka, 1991)
  - Nociceptive fusimotor metabolite stimulation
  - ↑ Static Gamma Fusimotor Activity
    - Capra et al., (2007)

INTEGRATED TRP HYPOTHESIS

(GERWIN ET AL., 2004)



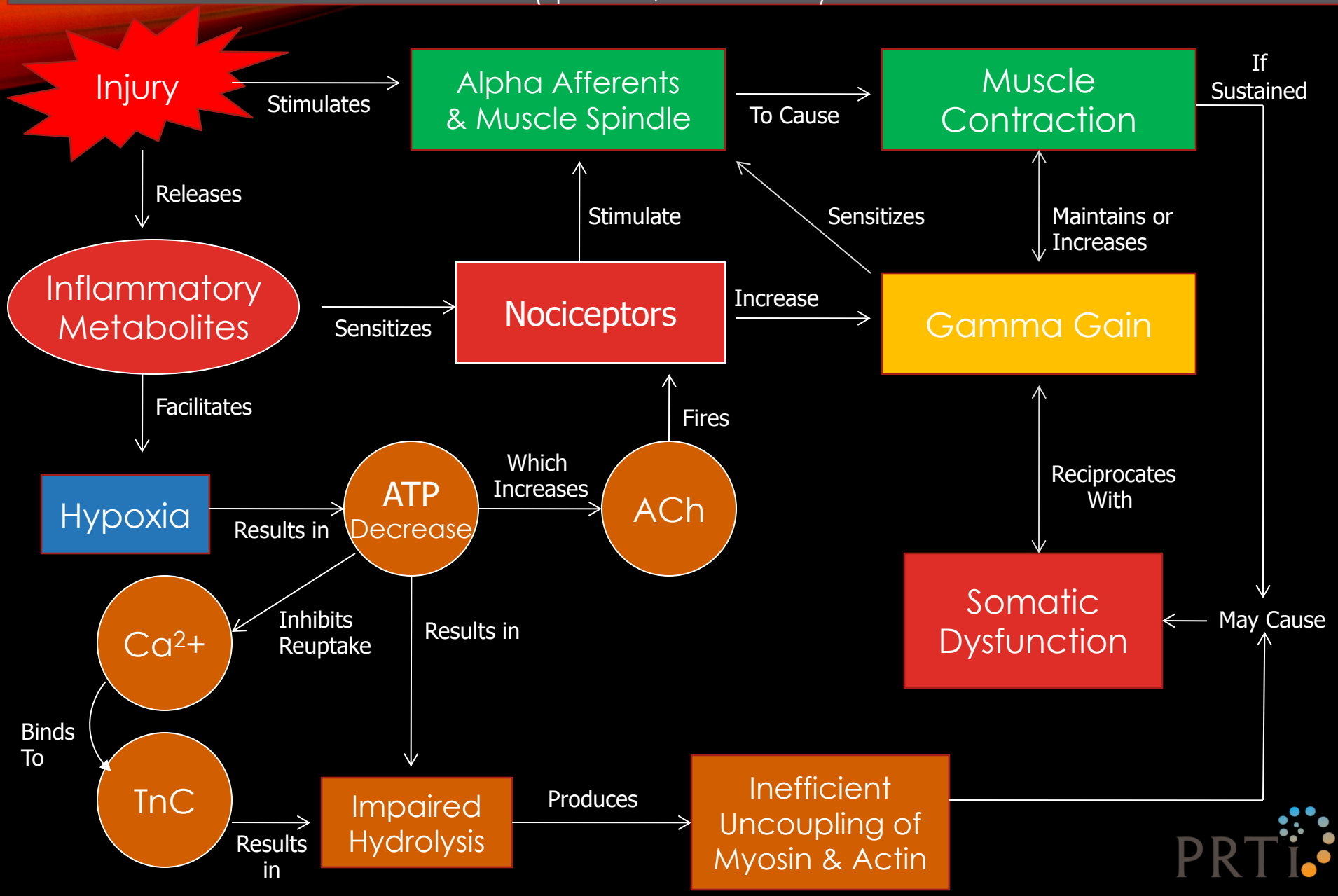
- Motor End Plate Dysfunction
  - Excessive

Key Points:

- ↑ Hypoxic Environment
  - ↓ pH =
    - activates nociceptors
    - ↓AChE
- ↑ Calcitonin Gene Related Peptide (CGRP)
  - ↑ ACh
- ACh can not be removed effectively

(MCT) Mechanical Coupling Theory

(Speicher, 2006 & 2016)



STRENGTH OF RECOMMENDATION TAXONOMY (SORT): A PATIENT-CENTERED APPROACH TO GRADING EVIDENCE IN THE MEDICAL LITERATURE (EBELL ET AL., 2004, 551)

A	Recommendation based on consistent and good-quality patient-oriented evidence.*
B	Recommendation based on inconsistent or limited-quality patient-oriented evidence.*
C	Recommendation based on consensus, usual practice, opinion, disease-oriented evidence,* or case series for studies of diagnosis, treatment, prevention, or screening.

**Patient-oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life. Disease-oriented evidence measures intermediate, physiologic, or surrogate end points that may or may not reflect improvements in patient outcomes (e.g., blood pressure, blood chemistry, physiologic function, pathologic findings).*

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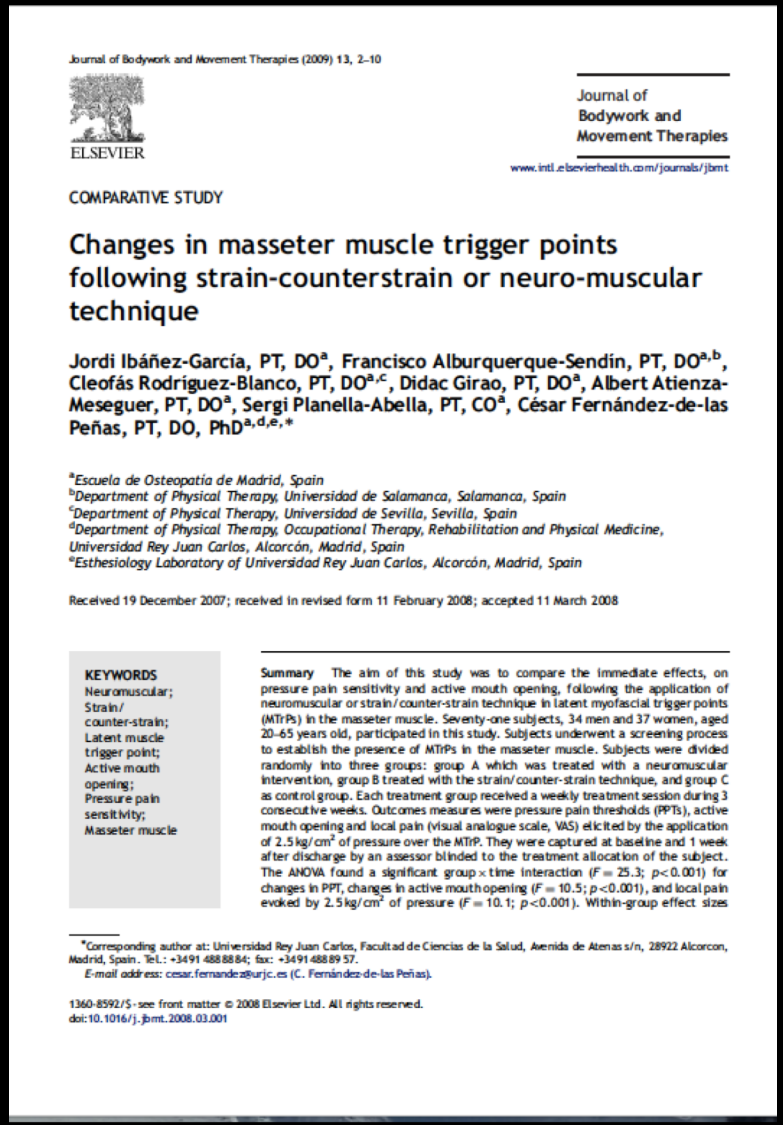
SUPPORTING EVIDENCE

- Pain Improvement
- Strength Improvement
- Range of Motion Improvement
- Quality of Life Improvement
- Somatization Delays Concussion Recovery

PRESSURE SENSITIVITY

- RCT
  - Assessor Blinded
- 71 Subjects with Latent Masseter TrPs
- Three Groups: SCS, Myofascial Release and Control
- TX 1x/wk for three weeks
- Outcome Measures:
  - Pressure Sensitivity (Digital Algometer)
  - VAS
  - Active Mouth Opening
- Results
  - SCS and Myofascial Intervention = significant differences (*d* = >1) for all except local pain (*d* = <.70)



Journal of Bodywork and Movement Therapies (2009) 13, 2–10

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Journal of Bodywork and Movement Therapies

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COMPARATIVE STUDY

Changes in masseter muscle trigger points following strain-counterstrain or neuro-muscular technique

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Received 19 December 2007; received in revised form 11 February 2008; accepted 11 March 2008

KEYWORDS
Neuromuscular; Strain/counter-strain; Latent muscle trigger point; Active mouth opening; Pressure pain sensitivity; Masseter muscle

Summary The aim of this study was to compare the immediate effects, on pressure pain sensitivity and active mouth opening, following the application of neuromuscular or strain/counter-strain technique in latent myofascial trigger points (MTrPs) in the masseter muscle. Seventy-one subjects, 34 men and 37 women, aged 20–65 years old, participated in this study. Subjects underwent a screening process to establish the presence of MTrPs in the masseter muscle. Subjects were divided randomly into three groups: group A which was treated with a neuromuscular intervention, group B treated with the strain/counter-strain technique, and group C as control group. Each treatment group received a weekly treatment session during 3 consecutive weeks. Outcomes measures were pressure pain thresholds (PPTs), active mouth opening and local pain (visual analogue scale, VAS) elicited by the application of 2.5 kg/cm^2 of pressure over the MTrP. They were captured at baseline and 1 week after discharge by an assessor blinded to the treatment allocation of the subject. The ANOVA found a significant group × time interaction ($F = 25.3$; $p<0.001$) for changes in PPT, changes in active mouth opening ($F = 10.5$; $p<0.001$), and local pain evoked by 2.5 kg/cm^2 of pressure ($F = 10.1$; $p<0.001$). Within-group effect sizes

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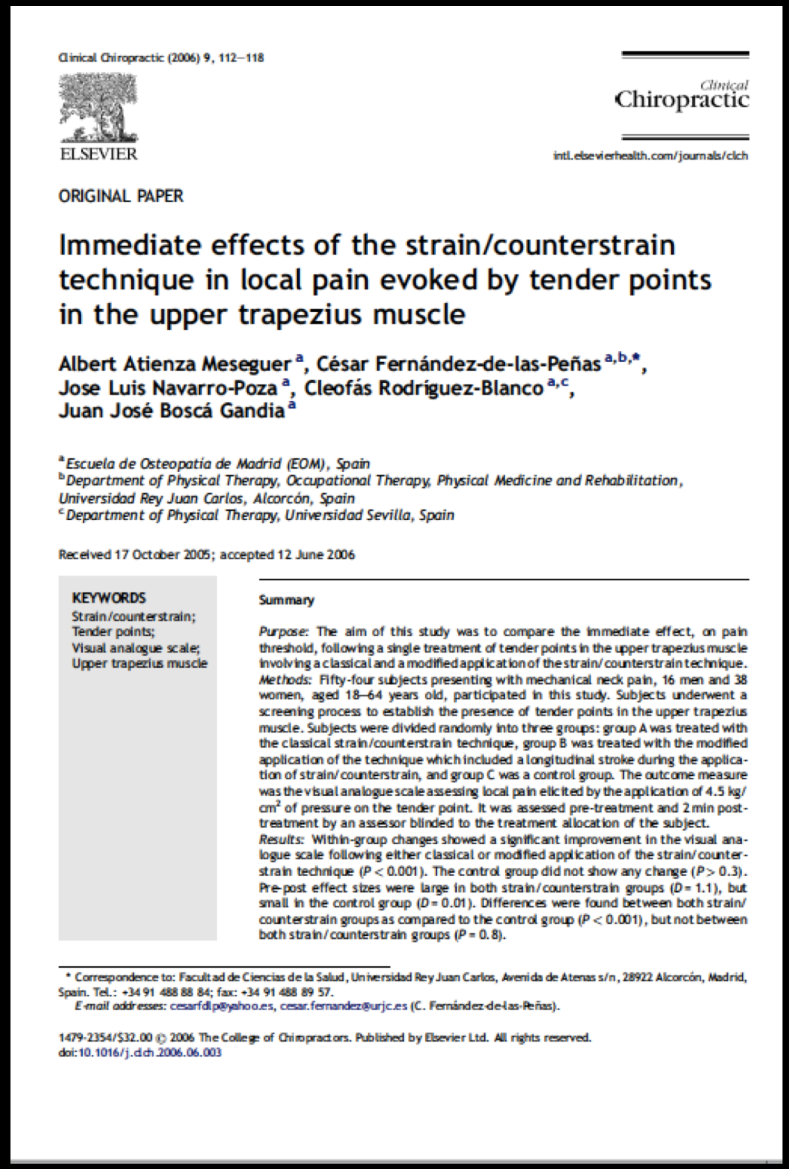
IMMEDIATE EFFECT OF SCS TRAPEZIUS TRPS

- RCT
  - Assessor Blinded
- N = 54
- Groups: SCS, SCS+Massage Stroke, Control
- Outcome Measures
  - VAS
  - Pressure Algometry
- Results
  - Both SCS groups showed significance in pain reduction (p = <.001) but not compared to one another (p = >.8)



Clinical Chiropractic (2006) 9, 112–118

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Clinical Chiropractic

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ORIGINAL PAPER

Immediate effects of the strain/counterstrain technique in local pain evoked by tender points in the upper trapezius muscle

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KEYWORDS
Strain/counterstrain;
Tender points;
Visual analogue scale;
Upper trapezius muscle

Summary

Purpose: The aim of this study was to compare the immediate effect, on pain threshold, following a single treatment of tender points in the upper trapezius muscle involving a classical and a modified application of the strain/counterstrain technique.
Methods: Fifty-four subjects presenting with mechanical neck pain, 16 men and 38 women, aged 18–64 years old, participated in this study. Subjects underwent a screening process to establish the presence of tender points in the upper trapezius muscle. Subjects were divided randomly into three groups: group A was treated with the classical strain/counterstrain technique, group B was treated with the modified application of the technique which included a longitudinal stroke during the application of strain/counterstrain, and group C was a control group. The outcome measure was the visual analogue scale assessing local pain elicited by the application of 4.5 kg/cm^2 of pressure on the tender point. It was assessed pre-treatment and 2 min post-treatment by an assessor blinded to the treatment allocation of the subject.
Results: Within-group changes showed a significant improvement in the visual analogue scale following either classical or modified application of the strain/counterstrain technique ($P < 0.001$). The control group did not show any change ($P > 0.3$). Pre-post effect sizes were large in both strain/counterstrain groups ($D = 1.1$), but small in the control group ($D = 0.01$). Differences were found between both strain/counterstrain groups as compared to the control group ($P < 0.001$), but not between both strain/counterstrain groups ($P = 0.8$).

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PRTi

TRAPEZIUS TRPS

- RCT Pilot
  - Double-blinded
- 20 Subjects Self-Reporting Pain
- Groups: SCS and Sham
  - Use of 90 Second Procedure
- Outcome Measures: Resting Pain, Pressure Threshold and Provoked Pain
- Results:
  - No significant difference to Sham

Short-Term Effects of Strain Counterstrain in Reducing Pain in Upper Trapezius Tender Points

A Pilot Study

Adam Perreault, MEd, ATC; Brent Kelln, PhD, MPT, OCS; Jay Hertel, PhD, ATC, FNATA, FACSM; Kelli Pugh, MS, ATC, CMT; and Susan Saliba, PhD, ATC, PT

ABSTRACT

Tender points are common in the upper trapezius muscles and can cause persistent pain and muscle spasm. The purpose of this pilot study was to evaluate short-term effects of a single intervention of strain counterstrain (SCS) as a treatment for tender points in the upper trapezius for the reduction of resting pain, pressure threshold, and provoked pain compared with a sham treatment. Twenty participants with self-reported upper trapezius pain volunteered for treatment with a single 90-second application of SCS or 90-second sham treatment. Pain measures were taken before, after, and 24 hours after treatment. Three separate 2x3 ANOVAs showed a significant main effect for time ($P = .003$), but not treatment for resting pain. No significant differences were found for the provoked pain or pain threshold. Statistical evidence showed no superiority of a single treatment of strain counterstrain over a sham treatment for upper trapezius tender point pain.

Approximately 23 million people (close to 10% of the U.S. population) suffer from chronic musculoskeletal disorders.[1] Myofascial pain is estimated to account for 85% of muscular pain due to injury and 90% of patients treated in pain clinics at a cost of $47 billion U.S. dollars per year.[2] Manual therapy is often sought as an appealing intervention, but few data substantiate its short- or long-term use. Many individuals prefer massage and alternative treatments over pharmacological intervention for chronic pain, especially when the discomfort is less severe.[3] Furthermore, many healthy people experience occasional muscle tightness and pain that may be treated with manual therapy. Strain counterstrain (SCS) is a manual therapy intervention used for the treatment of myofascial pain and has been proposed to interrupt muscle spasm.

Strain counterstrain attempts to place the painful area in a position of comfort to alleviate tension and pain. The mechanism of relief is thought to occur from the involvement of a combination of neurological and circulatory changes in the distressed area when placed in its most comfortable position.[4,5] The physiological mechanism for SCS is unknown but has been hypothesized to occur from a change in the muscle spindle activity. For example, a strain occurs from the muscle spindle activity, or gamma gain, and is produced by the rate of firing from the annulospiral nerve endings when the muscle is overstretched.[6] The muscle spindle sensitivity increases as a protective measure by increasing the gamma gain in the overstretched position. Other muscles that support the joint are in a shortened position and have less spindle activity at rest. However, once the joint is moved, the muscle spindles react to the new position by increasing tension. The shortened muscle creates resistance to movement and ultimately results in somatic dysfunction or pathology to the musculoskeletal system.[7] The aberrant gamma gain is likely due to local reflexogenic activity.[8]

Mr Perreault is Head Athletic Trainer, U.S. Mens Alpine Ski Team, United States Ski and Snowboard Association, Park City, Utah. Dr Kelln is from the Naval Health Clinic Hawaii, Pearl Harbor, Hawaii. Dr Hertel, Ms Pugh, and Dr Saliba are from the University of Virginia, Charlottesville, Va.

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The authors have no financial or proprietary interest in the materials presented herein.
The views expressed in this article are those of the authors and do not reflect the official policy of the Department of the Navy, the Department of Defense, nor the United States Government.

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UPPER TRAPEZIUS PG. 202

Tender point (TP) Location:

- Muscle belly of upper trapezius

Treatment Procedure:

- ❑ Patient is supine
- ❑ Move the head into lateral flexion towards TP or TrP
- ❑ Move the arm into flexion to approximately 90-120 degrees
- ❑ Move the arm through horizontal abduction and adduction
- ❑ Rotate the humerus while stabilizing the elbow against your body
- ❑ Apply either distraction or compression of the humerus for fine-tuning

Palpation Tip:

- ➢ Grasp the belly of the trapezius and roll forward and backward to separate.

CANCER PAIN AND RELATED MEASURES

- Systematic Review
  - Breast Mastectomy and Terminal Cancer Patients
- Massage and SCS found to be Moderate and Positive
  - Pain
  - Mood State
  - Anxiety
  - Fatigue
- Trigger Point [mashing] Therapy found to be **UNFAVORABLE**

Clar et al. Chiropractic & Manual Therapies 2014, 22:12
http://www.chiromt.com/content/22/1/12

CHIROPRACTIC & MANUAL THERAPIES

SYSTEMATIC REVIEW Open Access

Clinical effectiveness of manual therapy for the management of musculoskeletal and non-musculoskeletal conditions: systematic review and update of UK evidence report

Christine Clar[1], Alexander Tsertsvadze[1], Rachel Court[1], Gillian Lewando Hundt[2], Aileen Clarke[1] and Paul Sutcliffe[1*]

Abstract

Background: This systematic review updated and extended the "UK evidence report" by Bronfort et al. (Chiropr Osteopath 18:3, 2010) with respect to conditions/interventions that received an 'inconclusive' or 'negative' evidence rating or were not covered in the report.

Methods: A literature search of more than 10 general medical and specialised databases was conducted in August 2011 and updated in March 2013. Systematic reviews, primary comparative studies and qualitative studies of patients with musculoskeletal or non-musculoskeletal conditions treated with manual therapy and reporting clinical outcomes were included. Study quality was assessed using standardised instruments, studies were summarised, and the results were compared against the evidence ratings of Bronfort. These were either confirmed, updated, or new categories not assessed by Bronfort were added.

Results: 25,539 records were found; 178 new and additional studies were identified, of which 72 were systematic reviews, 96 were randomised controlled trials, and 10 were non-randomised primary studies. Most 'inconclusive' or 'moderate' evidence ratings of the UK evidence report were confirmed. Evidence ratings changed in a positive direction from inconclusive to moderate evidence ratings in only three cases (manipulation/mobilisation [with exercise] for rotator cuff disorder; spinal mobilisation for cervicogenic headache; and mobilisation for miscellaneous headache). In addition, evidence was identified on a large number of non-musculoskeletal conditions not previously considered; most of this evidence was rated as inconclusive.

Conclusions: Overall, there was limited high quality evidence for the effectiveness of manual therapy. Most reviewed evidence was of low to moderate quality and inconsistent due to substantial methodological and clinical diversity. Areas requiring further research are highlighted.

Keywords: Clinical effectiveness, Manual therapy, Systematic review, Musculoskeletal, Bronfort

Background

Manual therapy is a non-surgical type of conservative management that includes different skilled hands/fingers-on techniques directed to the patient's body (spine and extremities) for the purpose of assessing, diagnosing, and treating a variety of symptoms and conditions [1-4]. Manual therapy constitutes a wide variety of different techniques which may be categorised into four major groups: a) manipulation (thrust manipulation), b) mobilisation (non-thrust manipulation), c) static stretching, and d) muscle energy techniques. The definition and purpose of manual therapy varies across health care professionals.

Spinal manipulation and mobilisation are commonly used treatment modalities for back pain, particularly by physical therapists, osteopaths, and chiropractors. Back pain is an important health problem with serious societal and economic consequences for the developed world. It is estimated that in the USA 80% of people will experience

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PRTi

ACUTE LBP

- Randomized Trial
- 89 Subjects with Acute LBP
- Groups: SCS+Exercise, Exercise
- 2 Weeks, 4 treatments
- Outcome Measures
  - Oswestry low back pain disability questionnaire (2wks, 6wks, 28wks)
    - SF-36 Quality of Life Scale
    - VAS
    - 7-point global rating change
- Results
  - No significant differences were found with the exception of a significant difference in global change by the SCS group

Strain-Counterstrain therapy combined with exercise is not more effective than exercise alone on pain and disability in people with acute low back pain: a randomised trial

Cynan Lewis[1,2], Tina Souvlis[3] and Michele Sterling[2,4]

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Australia

Question: Is Strain-Counterstrain treatment combined with exercise therapy more effective than exercise alone in reducing levels of pain and disability in people with acute low back pain? **Design:** Randomised trial with concealed allocation, assessor blinding, and intention-to-treat analysis. **Participants:** 89 (55 female) participants between 18 and 55 years experiencing acute low back pain were randomised to experimental (n = 44) and control (n = 45) groups. **Intervention:** Participants attended four treatments in two weeks. The experimental group received Strain-Counterstrain treatment and review of standardised exercises (abdominal bracing, knee to chest, and lumbar rotation). The control group performed the standardised exercises under supervision. Following the intervention period, all participants received exercise progression, manual therapy, and advice. **Outcome measures:** The primary outcome was the modified Oswestry low back pain disability questionnaire, measured at 2 weeks (ie, end of treatment), 6 weeks, and 28 weeks. Secondary outcome measures included the SF-36, visual analogue scale pain ratings, and a 7-point global rating of change. **Results:** The experimental intervention was not more effective than exercise alone in reducing levels of pain and disability. Mean between-group differences in change from baseline for the Oswestry Disability Index were 0 (95% CI −6 to 7) after treatment, −1 (95% CI −7 to 6) at 6 weeks, and 2 (95% CI −4 to 8) at 28 weeks. Other outcomes did not differ significantly between groups. **Conclusion:** There is no advantage in providing Strain-Counterstrain treatment to patients with acute low back pain, although further studies could examine whether a subset of these patients can benefit from the treatment. **Trial registration:** ACTRN 12609000084280. **[Lewis C, Souvlis T, Sterling M (2011) Strain-Counterstrain therapy combined with exercise is not more effective than exercise alone on pain and disability in people with acute low back pain: a randomised trial. *Journal of Physiotherapy* 57: 91–98]**

Key words: Strain-Counterstrain, Manual therapy, Spinal manipulative therapy, Exercise

Introduction

Low back pain remains a common disabling condition (Bogduk and McGuirk 2002, Walker et al 2004) that is immensely costly in Australia (Rahman et al 2005) and the United States of America (Luo et al 2004). There is evidence that many individuals with acute low back pain develop persistent or recurrent low back pain (Henschke et al 2008, Pengel et al 2003, Abbott and Mercer 2002). The cause of acute low back pain is 'non-specific' in approximately 95% of cases (Hollingworth et al 2002). Nevertheless, physiotherapists have developed various algorithms for diagnosis of the condition (Deyo 1993, Winkel et al 1996) and many clinical interventions have been proposed and are used for the treatment of acute low back pain (Deyo 1993, March et al 2004, Reid et al 2002).

Recent guidelines assert that there is 'fair' evidence that spinal manipulative therapy provides a small to moderate benefit (a 5 to 20 point reduction in Oswestry Disability Index score) in the treatment of acute low back pain (Chou et al 2007). However, most international guidelines for treatment of non-specific acute low back pain recommend spinal manipulative therapy as a second-line intervention after first-line treatment of simple analgesics and advice (van Tulder et al 2006, Koes et al 2001) and this position is supported by contemporaneous meta-analyses, which concluded that spinal manipulative therapy was not more effective than recommended first-line intervention for treatment of non-specific acute low back pain (Assendelft et al 2003, Ferreira et al 2003) and chronic low back pain (Assendelft et al 2003). However, many physiotherapists use spinal manipulative therapy simultaneously with recommended first-line intervention for treatment of non-specific acute low back pain (Reid et al 2002).

Strain-Counterstrain is a manual therapy intervention involving passive positioning of the body or limbs. It has been proposed as a treatment for musculoskeletal pain and dysfunction (Jones et al 1995). When used to treat acute low back pain, this intervention can be considered as a form of spinal manipulative therapy because the pelvis, sacrum, and lower limbs are used to position the lumbar and sacral regions passively in degrees of flexion, extension, lateral flexion, and rotation. The rationale for Strain-Counterstrain treatment is unclear. A proprioceptive model (Korr 1975), which has not been experimentally tested, provides the hypothetical basis for the Strain-Counterstrain assessment and treatment using digitally tender points (Jones et al 1995, Kusunose 1993). To our knowledge, there is no experimental evidence to support the use of Strain-Counterstrain for the treatment of acute low back pain, although reductions in pain and disability following Strain-Counterstrain treatment for low back pain have been reported in case studies (Lewis and Flynn 2001). This randomised trial was intended to

CHRONIC LBP

- RCT
  - N= 60
  - Chronic LBP Patients (30-60yrs)
  - Conventional Therapy (CF) vs. PRT
  - 3 days per week for 6 weeks
  - PRT Group (QL, Iliopsoas, Piriformis, ITB)
  - CF Group (Infrared, Ultrasound, Therex, Vibration)
- Both found effective, CF >
  - VAS
  - Lumbar ROM
  - Functional Disability (ODI)

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Original Research Article

CONVENTIONAL THERAPY VERSUS POSITIONAL RELEASE TECHNIQUE IN THE TREATMENT OF CHRONIC LOW BACK DYSFUNCTION

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Faculty of Physical therapy, Department of Basic Science, Lecturer in the Faculty of Physical Therapy, October 6 University, Egypt.

ABSTRACT

Background: Chronic low back dysfunction (CLBD) is the most common problem of the working-age population in modern industrial society. It is not a life-threatening illness but it has a long-term impact on medical care expenditures for injured workers.

Purpose: To compare the effect of conventional therapy and positional release technique on pain, lumbar range of motion and functional disability in patients with chronic low back dysfunction.

Materials and Methods: Sixty patients from both sexes were diagnosed with CLBP, aged 30 to 60 years and were divided randomly into two equal groups with thirty patients in each group; group A received conventional therapy that include (infrared, ultrasound, stretch and strength exercises for back and abdominal muscles) and group B received positional release technique. The treatment sessions were applied 3 days per week for 6 weeks. The pain was measured by Visual Analogue Scale, the lumbar range of motion was measured by Inclinometer and Functional disability was measured by Oswestry disability scale. Measurements were taken at two intervals pre-treatment and post treatment.

Results: The result of the current study revealed that there was a statistically significant reduction ($p < 0.05$) in pain level and functional disability and significant increase ($p < 0.05$) in lumbar flexion in favor to group A than group B.

Conclusion: Positional release technique and conventional therapy may be an effective treatment for individuals with chronic low back dysfunction although the result of this study revealed that conventional therapy has a significant improvement in pain severity, functional disability and lumbar flexion range of motion than positional release technique.

KEY WORDS: Chronic Low Back Dysfunction, Conventional Physical Therapy Program, Positional Release Technique, Functional Disability.

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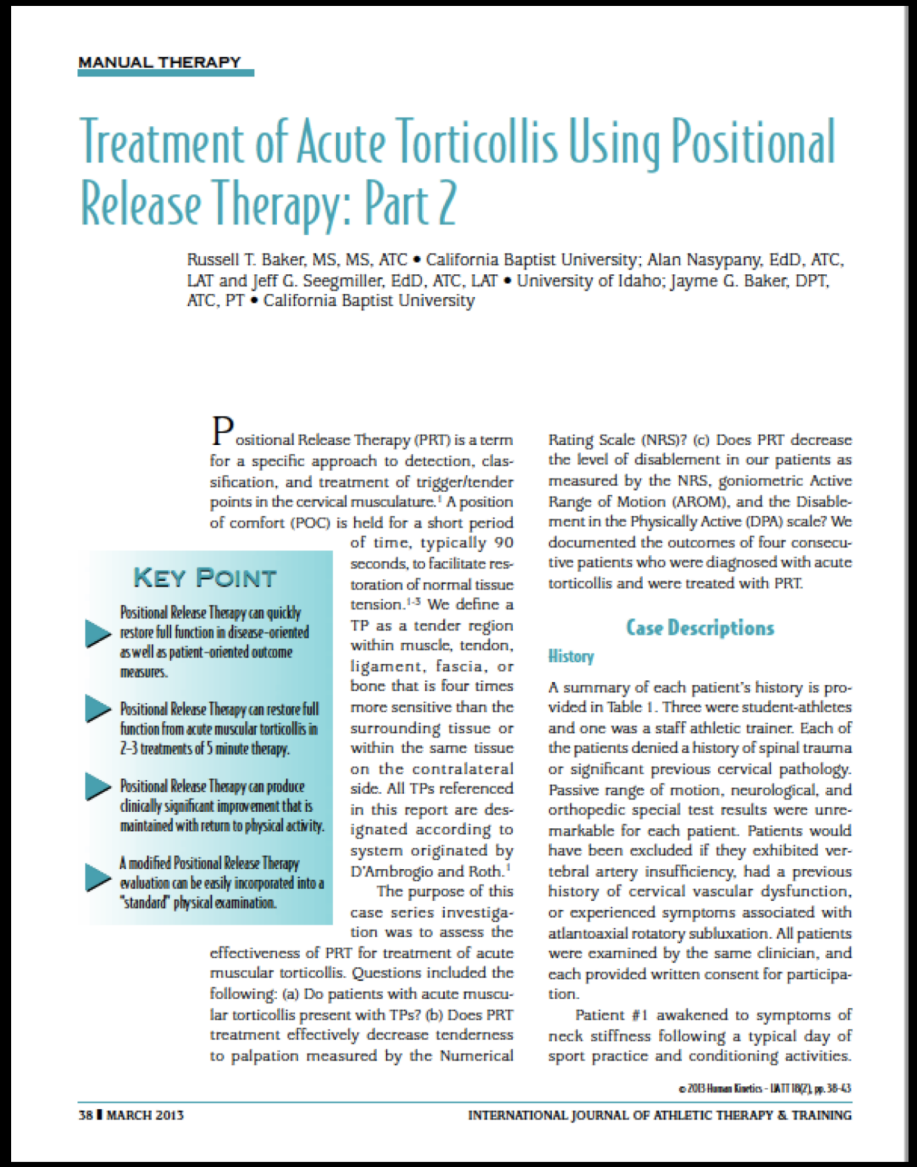
NECK PAIN

- Case-Series Design
- PRT for TX of Acute Torticollis
- Three Student-Athletes and One Staff Athletic Trainer
- Treated 1x day for 3 days
  - 90 Second Procedure
  - No Other TX
- Outcome Measures
  - Neck ROM
  - VAS
  - DPA Scale
- Results
  - MCID Positive for all Outcome Measures



MANUAL THERAPY

Treatment of Acute Torticollis Using Positional Release Therapy: Part 2

Russell T. Baker, MS, MS, ATC • California Baptist University; Alan Nasypany, EdD, ATC, LAT and Jeff G. Seegmiller, EdD, ATC, LAT • University of Idaho; Jayme G. Baker, DPT, ATC, PT • California Baptist University

Positional Release Therapy (PRT) is a term for a specific approach to detection, classification, and treatment of trigger/tender points in the cervical musculature.[1] A position of comfort (POC) is held for a short period of time, typically 90 seconds, to facilitate restoration of normal tissue tension.[1-3] We define a TP as a tender region within muscle, tendon, ligament, fascia, or bone that is four times more sensitive than the surrounding tissue or within the same tissue on the contralateral side. All TPs referenced in this report are designated according to system originated by D'Ambrogio and Roth.[1]

The purpose of this case series investigation was to assess the effectiveness of PRT for treatment of acute muscular torticollis. Questions included the following: (a) Do patients with acute muscular torticollis present with TPs? (b) Does PRT treatment effectively decrease tenderness to palpation measured by the Numerical Rating Scale (NRS)? (c) Does PRT decrease the level of disablement in our patients as measured by the NRS, goniometric Active Range of Motion (AROM), and the Disablement in the Physically Active (DPA) scale? We documented the outcomes of four consecutive patients who were diagnosed with acute torticollis and were treated with PRT.

KEY POINT

- Positional Release Therapy can quickly restore full function in disease-oriented as well as patient-oriented outcome measures.
- Positional Release Therapy can restore full function from acute muscular torticollis in 2-3 treatments of 5 minute therapy.
- Positional Release Therapy can produce clinically significant improvement that is maintained with return to physical activity.
- A modified Positional Release Therapy evaluation can be easily incorporated into a "standard" physical examination.

Case Descriptions

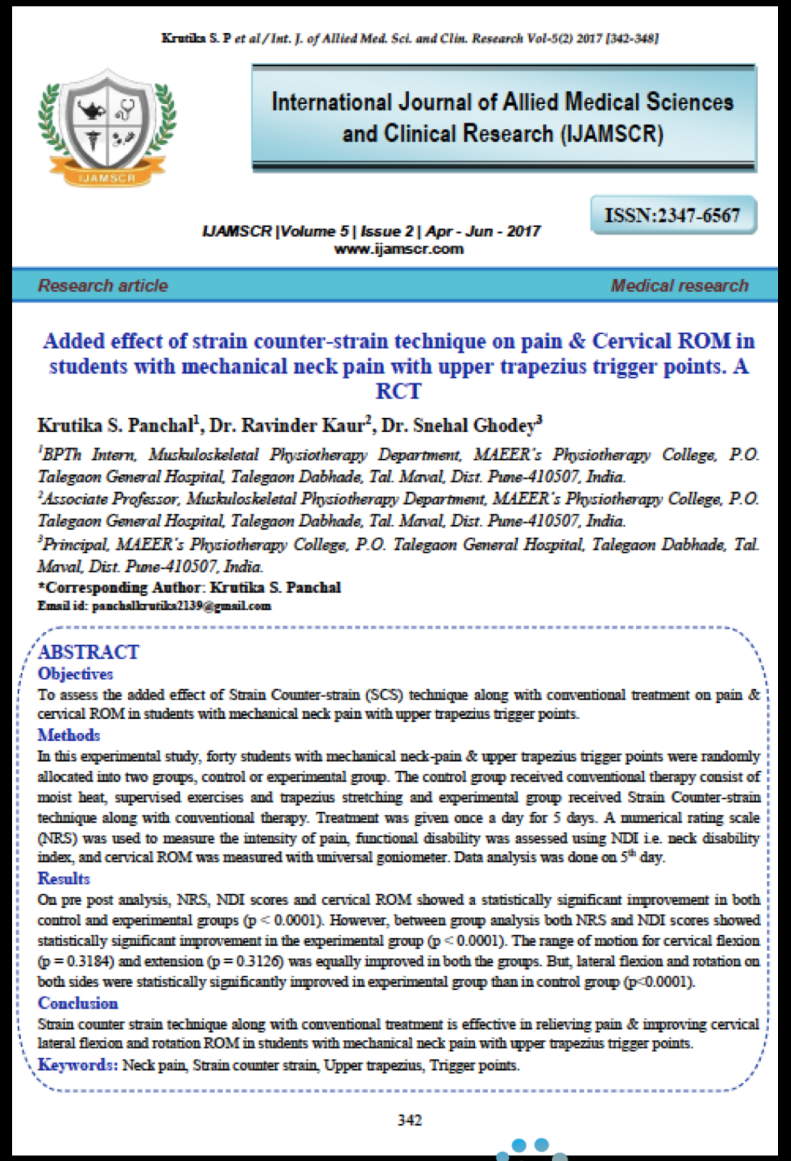
History

A summary of each patient's history is provided in Table 1. Three were student-athletes and one was a staff athletic trainer. Each of the patients denied a history of spinal trauma or significant previous cervical pathology. Passive range of motion, neurological, and orthopedic special test results were unremarkable for each patient. Patients would have been excluded if they exhibited vertebral artery insufficiency, had a previous history of cervical vascular dysfunction, or experienced symptoms associated with atlantoaxial rotatory subluxation. All patients were examined by the same clinician, and each provided written consent for participation.

Patient #1 awakened to symptoms of neck stiffness following a typical day of sport practice and conditioning activities.

NECK PAIN

- RCT
- TX for mechanical neck pain
  - Control = Conventional Therapy
  - Experimental = SCS + Conventional Therapy
- 40 symptomatic students
- Treated 1x day for 5 days
- Outcome Measures
  - Neck ROM
  - NDI (Neck Disability Index)
  - NRS Scale
- Results
  - Both improved, but the experimental group showed greater significant gains than control alone



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Research article | Medical research

Added effect of strain counter-strain technique on pain & Cervical ROM in students with mechanical neck pain with upper trapezius trigger points. A RCT

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ABSTRACT

Objectives
To assess the added effect of Strain Counter-strain (SCS) technique along with conventional treatment on pain & cervical ROM in students with mechanical neck pain with upper trapezius trigger points.

Methods
In this experimental study, forty students with mechanical neck-pain & upper trapezius trigger points were randomly allocated into two groups, control or experimental group. The control group received conventional therapy consist of moist heat, supervised exercises and trapezius stretching and experimental group received Strain Counter-strain technique along with conventional therapy. Treatment was given once a day for 5 days. A numerical rating scale (NRS) was used to measure the intensity of pain, functional disability was assessed using NDI i.e. neck disability index, and cervical ROM was measured with universal goniometer. Data analysis was done on 5th day.

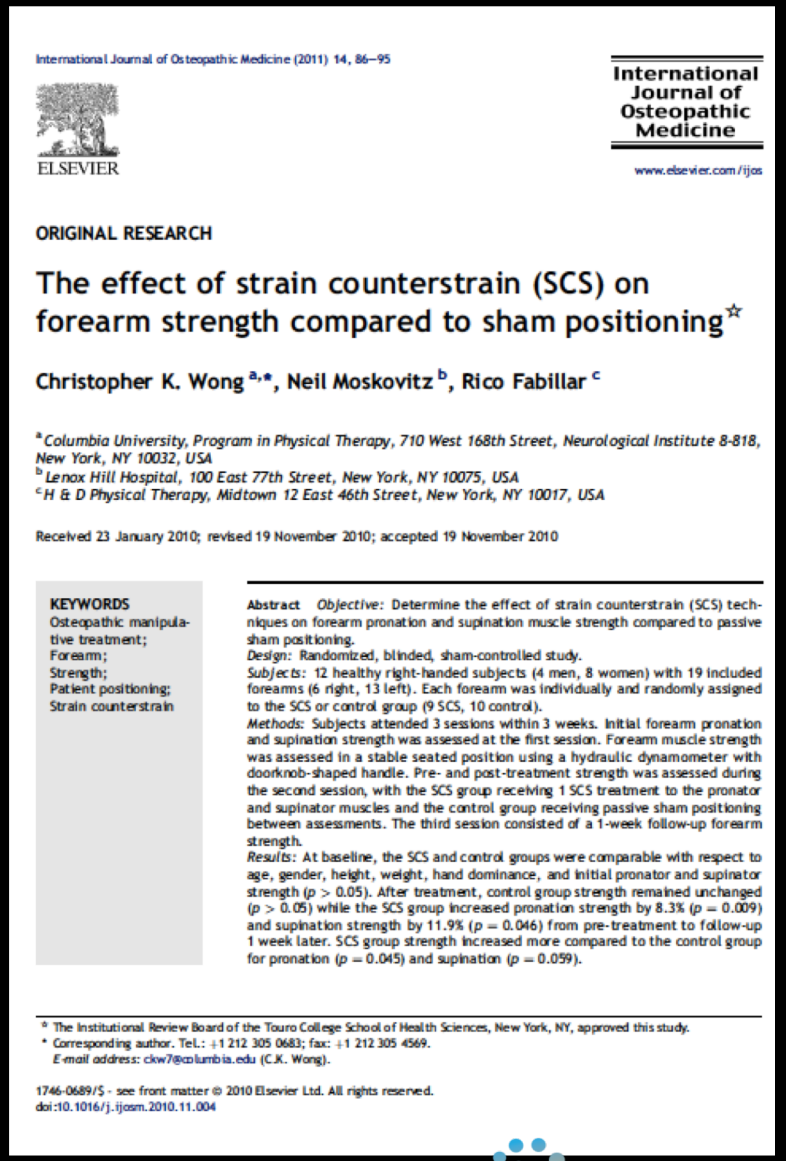
Results
On pre post analysis, NRS, NDI scores and cervical ROM showed a statistically significant improvement in both control and experimental groups ($p < 0.0001$). However, between group analysis both NRS and NDI scores showed statistically significant improvement in the experimental group ($p < 0.0001$). The range of motion for cervical flexion ($p = 0.3184$) and extension ($p = 0.3126$) was equally improved in both the groups. But, lateral flexion and rotation on both sides were statistically significantly improved in experimental group than in control group ($p<0.0001$).

Conclusion
Strain counter strain technique along with conventional treatment is effective in relieving pain & improving cervical lateral flexion and rotation ROM in students with mechanical neck pain with upper trapezius trigger points.

Keywords: Neck pain, Strain counter strain, Upper trapezius, Trigger points.

STRENGTH IMPROVEMENT

- RCT
- 49 Subjects with Elbow Tender Points (TPs) and Weakness
- 3 Treatments over 2wks
  - Follow-up at 4 weeks
- Groups: SCS, Sham Positioning
- Outcome Measures
  - VAS
  - Grip Strength (Handheld Dynometer)
- Results
  - SCS Groups showed significantly greater strength gains than sham



International Journal of Osteopathic Medicine (2011) 14, 86–95

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International Journal of Osteopathic Medicine

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ORIGINAL RESEARCH

The effect of strain counterstrain (SCS) on forearm strength compared to sham positioning☆

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Received 23 January 2010; revised 19 November 2010; accepted 19 November 2010

KEYWORDS
Osteopathic manipulative treatment;
Forearm;
Strength;
Patient positioning;
Strain counterstrain

Abstract *Objective:* Determine the effect of strain counterstrain (SCS) techniques on forearm pronation and supination muscle strength compared to passive sham positioning.
Design: Randomized, blinded, sham-controlled study.
Subjects: 12 healthy right-handed subjects (4 men, 8 women) with 19 included forearms (6 right, 13 left). Each forearm was individually and randomly assigned to the SCS or control group (9 SCS, 10 control).
Methods: Subjects attended 3 sessions within 3 weeks. Initial forearm pronation and supination strength was assessed at the first session. Forearm muscle strength was assessed in a stable seated position using a hydraulic dynamometer with doorknob-shaped handle. Pre- and post-treatment strength was assessed during the second session, with the SCS group receiving 1 SCS treatment to the pronator and supinator muscles and the control group receiving passive sham positioning between assessments. The third session consisted of a 1-week follow-up forearm strength.
Results: At baseline, the SCS and control groups were comparable with respect to age, gender, height, weight, hand dominance, and initial pronator and supinator strength ($p > 0.05$). After treatment, control group strength remained unchanged ($p > 0.05$) while the SCS group increased pronation strength by 8.3% ($p = 0.009$) and supination strength by 11.9% ($p = 0.046$) from pre-treatment to follow-up 1 week later. SCS group strength increased more compared to the control group for pronation ($p = 0.045$) and supination ($p = 0.059$).

☆ The Institutional Review Board of the Touro College School of Health Sciences, New York, NY, approved this study.

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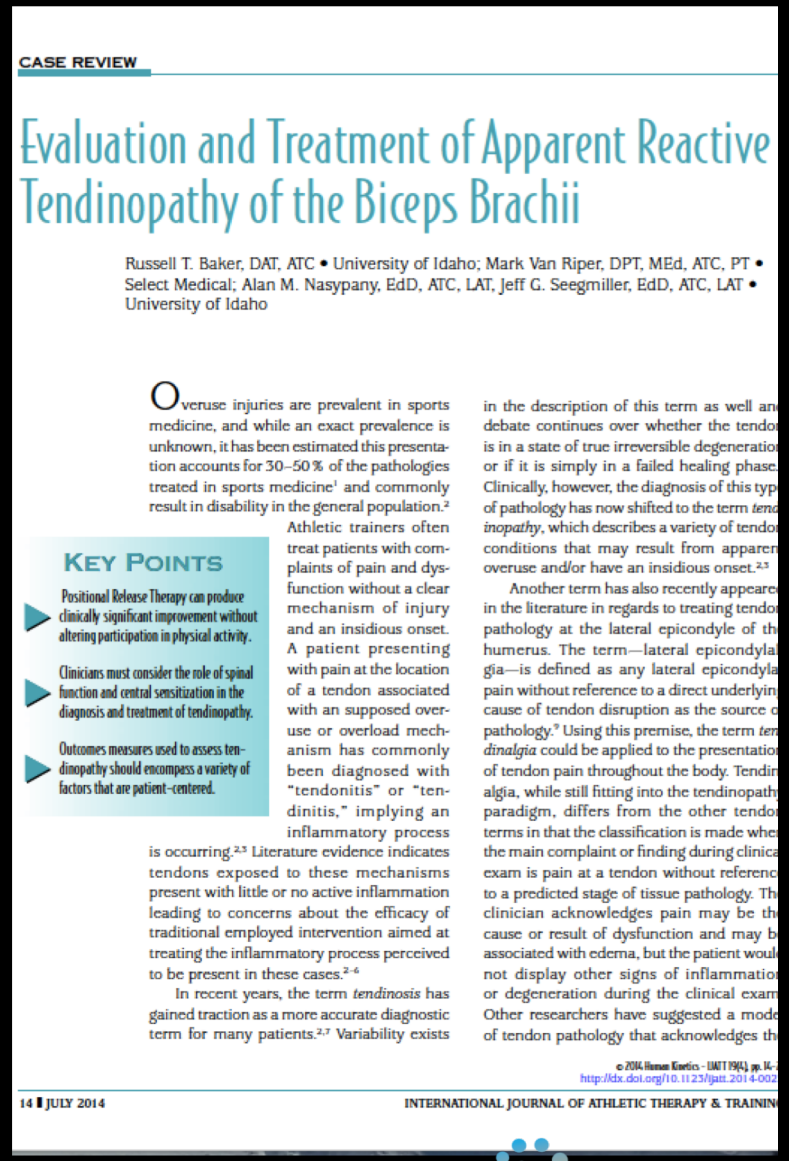
PRTi

RANGE OF MOTION IMPROVEMENT

- Single Case Design
- 21 yr. old female swimmer with Tendinopathy of the Biceps Brachii
- 1x day over 3 days with 60 day follow-up
- Outcome Measures
  - ROM
  - Strength*
  - VAS
  - DPA
- Results
  - Positive MCID for all Outcomes



CASE REVIEW

Evaluation and Treatment of Apparent Reactive Tendinopathy of the Biceps Brachii

Russell T. Baker, DAT, ATC • University of Idaho; Mark Van Riper, DPT, MEd, ATC, PT • Select Medical; Alan M. Nasypany, EdD, ATC, LAT, Jeff G. Seegmiller, EdD, ATC, LAT • University of Idaho

KEY POINTS

- Positional Release Therapy can produce clinically significant improvement without altering participation in physical activity.
- Clinicians must consider the role of spinal function and central sensitization in the diagnosis and treatment of tendinopathy.
- Outcomes measures used to assess tendinopathy should encompass a variety of factors that are patient-centered.

Overuse injuries are prevalent in sports medicine, and while an exact prevalence is unknown, it has been estimated this presentation accounts for 30–50 % of the pathologies treated in sports medicine[1] and commonly result in disability in the general population.[2] Athletic trainers often treat patients with complaints of pain and dysfunction without a clear mechanism of injury and an insidious onset. A patient presenting with pain at the location of a tendon associated with an supposed overuse or overload mechanism has commonly been diagnosed with "tendonitis" or "tendinitis," implying an inflammatory process is occurring.[2,3] Literature evidence indicates tendons exposed to these mechanisms present with little or no active inflammation leading to concerns about the efficacy of traditional employed intervention aimed at treating the inflammatory process perceived to be present in these cases.[2-6]

In recent years, the term *tendinosis* has gained traction as a more accurate diagnostic term for many patients.[2,7] Variability exists in the description of this term as well an debate continues over whether the tendo is in a state of true irreversible degeneratio or if it is simply in a failed healing phase. Clinically, however, the diagnosis of this typ of pathology has now shifted to the term *tend inopathy*, which describes a variety of tendo conditions that may result from apparen overuse and/or have an insidious onset.[2,3]

Another term has also recently appeare in the literature in regards to treating tendo pathology at the lateral epicondyle of th humerus. The term—lateral epicondyla gia—is defined as any lateral epicondyla pain without reference to a direct underlyin cause of tendon disruption as the source pathology.[9] Using this premise, the term *ten dinalgia* could be applied to the presentatio of tendon pain throughout the body. Tendi algia, while still fitting into the tendinopath paradigm, differs from the other tendo terms in that the classification is made whe the main complaint or finding during clinica exam is pain at a tendon without referenc to a predicted stage of tissue pathology. Th clinician acknowledges pain may be th cause or result of dysfunction and may b associated with edema, but the patient woul not display other signs of inflammatio or degeneration during the clinical exam Other researchers have suggested a mode of tendon pathology that acknowledges th

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SCAPULAR POSITIONING

- Case Series Design
- 7 males, 10 females
- 1 PRT treatment of Pectoralis Minor
- Pre/Post/24 hours Post
- Statistically Significant Results for post treatment
  - Pectoralis Minor Length (p<.016)
  - Scapular Positioning at 0 deg. Abd.(p<.014) And at 90 deg. Abd. (p<.042)
  - Forward Shoulder Posture (p<.001)
- Improvements were not maintained after 24 hours

CLINICAL OUTCOMES RESEARCH

Short Term Effects of a Pectoralis Minor Positional Release in Collegiate Swimmers: A Case Series

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ABSTRACT

A tight pectoralis minor correlates to abnormal scapular kinematics, which can cause pain, loss of range of motion and even loss of function, due to the change in scapular position. With these muscular imbalances causing forward scapular posture, the pectoralis minor is a key component to address in the prevention and treatment of shoulder impingement and scapular dyskinesis. This study investigated the effectiveness of a single positional release therapy (PRT) treatment of the pectoralis minor on scapular posture in collegiate swimmers immediately and 24 hours post intervention. Seventeen Division III collegiate swimmers (7 males and 10 females) volunteered to participate, with only one shoulder being excluded due to recent injury (n=33). Researchers measured resting pectoralis minor muscle length, forward shoulder posture and scapular elevation of both shoulders. Data were collected a total of 3 times; prior to the PRT intervention, right after the intervention and again 24 hours post intervention. Each shoulder was treated with a single session of PRT on the pectoralis minor. There was a significant difference for resting pectoralis minor length immediately post-intervention compared to baseline (p=.016). Scapular positioning at 0° abduction had a statistically significant improvement in position from immediate post-intervention to 24 hours post-intervention (p=.014). Scapular positioning at 90° of abduction also had a statistically significant increase in position from baseline to immediate post-intervention (p=.042). For forward shoulder posture, there was a statistically significant improvement in position from baseline to immediate post- intervention (p≤.001). The results of this case series show that a single treatment of PRT has an immediate effect in reducing resting pectoralis minor muscle length and decreasing rounded shoulder posture. However, this single treatment of PRT was not enough to maintain these effects after 24 hours, and should be combined with other manual therapies or rehabilitation protocols to address scapular positioning in collegiate swimmers.

Key Phrases
Manual techniques, injury risk reduction, college and university patient population

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INTRODUCTION

There is a consistently growing population of collegiate swimmers within Division I, II, and III institutions totaling around 486,000 swimmers in the 2015-16 academic year.[1] Competitive swimming athletes are at risk for shoulder injury due to an excessive amount of shoulder revolutions that can cause the anterior shoulder musculature to hypertrophy.[2] During the freestyle, butterfly, and backstroke of competitive swimming, the athlete is consistently applying adduction and internal rotation forces from the shoulder in order to propel themselves through the water, which may lead to an imbalance of agonist-antagonist muscles.[3] This muscular imbalance often leads to scapular dyskinesis, which is defined as abnormal movement patterns causing alteration of optimal scapular kinematics.[4,5]

The pectoralis minor specifically has been related to shoulder pain in swimmers,[2] and scapular dyskinesis due to its shortened muscle length.[6,7] A tight pectoralis minor can be either a primary or secondary cause of shoulder pain,[8] and the diminished muscle length prohibits proper scapular upward rotation, posterior tilting and external rotation.[9-11] Often times swimmers with bilaterally tight pectoralis minor muscles develop forward scapular posture, which has been described as a forward head and rounded shoulders position, and contributes to shoulder impingement.[2,9,12] Previous studies have stated that the pectoralis minor muscle tightness is typically due to adaptive changes in the muscle belly from repetitive motions that involve scapular

PRTi

RANGE OF MOTION IMPROVEMENT

- RCT
- 40 asymptomatic female college students
- Groups: PRT, Passive Stretch
- One time intervention
  - 1x for PRT
  - 2x for static stretch by therapist
- Outcome Measures
  - Sit to Reach Test
- Results
  - Both conditions produced significant gains in hamstring / lumbar flexibility

Comparing the Effectiveness of Positional Release Therapy Technique & Passive Stretching on Hamstring Muscle Through Sit to Reach Test in Normal Female Subjects

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Abstract

Aim

To find out the effectiveness of Positional Release Therapy and Passive Stretching Techniques on lumbar flexion muscle range of motion flexibility outcome measurement in normal female subjects.

Methods

A total of 40 asymptomatic subjects among student community within 18 to 25 years of age were selected from vadodara city and from the department of physiotherapy, Sumandeep Vidyapeeth University, sampling method through convenient sampling. The subjects were randomly divided in two groups i.e. Group-1 given positional release therapy technique and Group-2 given passive stretching technique on hamstrings muscle respectively. Active lumbar flexion range was measured by Sit to Reach Test before and after the intervention. The data were collected and analyzed by Paired' and unpaired't' test method.

Results

The't' showed a significant (p=0.000) post test measurement values for both the groups.

Conclusion

When comparing the results of both group post values, it shows p-value [0.933]. No statistically significant differences were found in between two groups post test values in bringing lumbar flexion movement flexibility more beneficial. Both techniques are equally effective in bringing lumbar flexion range of motion flexibility.

Key Words

Flexibility, Stretching, Positional Release Therapy, Sit to reach test.

Introduction

Flexibility is the ability to move a single joint or series of joints smoothly and easily through an unrestricted, pain-free range of motion. Flexibility is related to the extensibility of musculo-tendinous units that cross a joint based on their ability to relax or deform and yield to a stretch force. [1] It is important both inflexibility and hyper-flexibility can result in higher risks of injury. In addition, an imbalance in flexibility could predispose the individual to an increased risk of injury. [2] Mobility is maintained in most individuals by routine, daily use of their limbs and joints in normal daily activities. However, adaptive shortening can occur in those who spend long periods in single posture [e.g. sitting most of the day] and mobility can be lost. Normal mobility includes adequate joint range of motion and muscle range of motion. Progressive adaptive shortening of the soft tissue occurs as the body responds to decreased loading. This shortening limits mobility and function, reducing the patient's ability to carry out normal activities of daily living, work or leisure activities. The patient accommodates these limitations by substituting other joints or limbs to achieve functional goals, there by contributing to the disuse.[3] Forward bending is a coupled movement combining lumbar flexion and pelvic rotation, the so-called lumbar–pelvic rhythm. It results from coordinated activity between the back extensor muscles (erector spinae) and the hip extensor muscles (gluteus and hamstrings).[4] The hamstrings are example of muscle groups that have a tendency to shorten[5]. Stiffness in the hamstrings is often compensated by lumbar spine motion, placing more load on the spine. Lengthening the hamstrings minimizes the stress placed on the spine and is the basis for hamstring stretching, an approach used by some persons to remedy back pain.[3] Muscle tightness can be present without a joint contracture. Multi joint muscles are particularly vulnerable to developing tightness, especially in those individuals who do not regularly perform stretching exercises.[6] During forward bending, stiff hamstrings can restrict pelvic forward rotation, resulting in flexion stress on the lumbar spine.[7] When limitation of joint motion is because of soft tissue shortening, stretching have been found to be effective[8] and Positional Release Therapy is also a highly effective technique that helps reduce pain and restore function to muscles, bones, and joints[9].

Numerous researchers have compared various stretching techniques to determine which technique is most effective for increasing joint range of motion (ROM). Static stretching is a commonly used method of stretching in which soft tissue are elongated just past the point of tissue resistance and then held in the lengthened position with a sustained stretch force over a period of time. Static stretching is an effective form of stretching to increase flexibility and a safer form.[8] Positional release therapy is method of total body evaluation and treatment using tender points and a position of comfort (POC) to resolve the associated dysfunction. Positional Release Therapy is an indirect (the body part moves away from the resistance barrier, i.e. the direction of greatest ease) and passive (the therapist performs all the movements without help from the patient) method of treatment. As a result of treatment using PRT, there is a decrease in muscle tension, facial tension, and joint hypo-mobility. These changes in turn result in a significant increase in functional range of motion and decrease in pain. [10] It is a hands-on treatment that alleviates muscle and connective tissue tightness by the use of very specific treatment positions held for 90-120 seconds. [8] Many authors have studied different approaches of muscle stretching and the duration of application of such procedures but no studies were there in comparing the significant effect in relation to our topic.

Methodology

A total of 40 young female subjects among student community within 18 to 25 years of age were selected. This study was comparative study using convenient sampling. Orthopedics problem around hip, knee and spine, subjects with hamstring strain or contusion, Obesity, any congenital conditions or diseases in lower extremity are excluded. Subjects were volunteers and signed an approved informed consent statement.

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SUPPORTING EVIDENCE

Quality of Life Improvement

- Clar et al. (2014)
- Baker et al (2013 & 2014)
- Lewis et al (2012)
- Krutika et al (2017)

SOMATIZATION AND CONCUSSION

- Longitudinal Study
  - 2012-2015
- 2,055 high school and collegiate athletes
  - 127 Concussed and Followed
  - Baselines Taken
- Outcome Measures
  - Duration of Reported Post Concussion Symptoms
  - Baseline and Post-Injury Clinical Examinations
    - BSI-18 Somatization Scale
  - Battery of Concussion and Quality of Life Tests (Paper and Computer)
    - Assessed immediately after and at 8, 15 and 45 days post
- Results
  - Those identified with preinjury somatization took longer to recover

ARTICLES

Preinjury somatization symptoms contribute to clinical recovery after sport-related concussion

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ABSTRACT

Objective: To determine the degree to which preinjury and acute postinjury psychosocial and injury-related variables predict symptom duration following sport-related concussion.

Methods: A total of 2,055 high school and collegiate athletes completed preseason evaluations. Concussed athletes (n = 127) repeated assessments serially (<24 hours and days 8, 15, and 45) postinjury. Cox proportional hazard modeling was used to predict concussive symptom duration (in days). Predictors considered included demographic and history variables; baseline psychological, neurocognitive, and balance functioning; acute injury characteristics; and postinjury clinical measures.

Results: Preinjury somatic symptom score (Brief Symptom Inventory–18 somatization scale) was the strongest premorbid predictor of symptom duration. Acute (24-hour) postconcussive symptom burden (Sport Concussion Assessment Tool–3 symptom severity) was the best injury-related predictor of recovery. These 2 predictors were moderately correlated ($r = 0.51$). Path analyses indicated that the relationship between preinjury somatization symptoms and symptom recovery was mediated by postinjury concussive symptoms.

Conclusions: Preinjury somatization symptoms contribute to reported postconcussive symptom recovery via their influence on acute postconcussive symptoms. The findings highlight the relevance of premorbid psychological factors in postconcussive recovery, even in a healthy athlete sample relatively free of psychopathology or medical comorbidities. Future research should elucidate the neurobiopsychosocial mechanisms that explain the role of this individual difference variable in outcome following concussive injury. *Neurology*® 2016;86:1856–1863

GLOSSARY

BESS = Balance Error Scoring System; **BSI-18** = Brief Symptom Inventory-18; **CI** = confidence interval; **DSM-V** = *Diagnostic and Statistical Manual of Mental Disorders, 5th edition*; **HR** = hazard ratio; **ImPACT** = Immediate Post-Concussion Assessment and Cognitive Testing; **MSVT** = Medical Symptom Validity Test; **SAC** = Standardized Assessment of Concussion; **SCAT3** = Sport Concussion Assessment Tool, 3rd edition; **SRC** = sport-related concussion; **SS** = standard score; **SWLS** = Satisfaction With Life Scale.

As the clinical and neurobiologic sequelae of sport-related concussion (SRC) are becoming better understood,[1–6] there is increasing interest in understanding individual differences in recovery. Identifying those at risk for prolonged recovery is critical to developing early interventions that maximize outcomes. Investigations into predictors of symptom recovery after SRC have largely focused on demographics, acute injury characteristics, and clinical assessment measures. Although findings have not been ubiquitous,[7–9] the most consistent independent predictor of recovery is early self-reported concussive symptoms.[10,11] Other variables historically thought to signify traumatic brain injury severity have not been predictive.[3] Consequently, acute symptom burden appears to be the strongest marker of concussion severity and recovery.[12]

Yet symptom burden likely conflates several distinct factors, including the consequences of the biomechanical forces during and neurologic processes after injury and one's premorbid predisposition to experience symptoms. The relevance of preinjury psychological factors in concussion recovery is accepted for civilian and military patients,[13] although studies of these

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Supplemental data at Neurology.org

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Go to Neurology.org for full disclosures. Funding information and disclosures deemed relevant by the authors, if any, are provided at the end of the article.

INDICATIONS (SPEICHER, 2016)

- Acute, subacute, and chronic pain
- Neuropathic pain
- Somatic referred pain
- Muscle spasm
- Tissue hypertonicity
- Range of motion deficit
- Joint hypomobility
- Fibromyalgia
- **Central sensitization syndrome**
- **Peripheral sensitization**
- Postconcussive syndrome
- Headache
- Myofascial pain syndrome
- Cumulative trauma
- Lymphatic compromise
- Hypoperfusion
- Muscular weakness
- Visceral dysfunction

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WILL PRT WORK IN THIS CASE?

CONTRAINDICATIONS (SPEICHER, 2016)

Absolute

- Open wounds
- Acute nerve root compression
- Infection
- Deep vein thrombosis
- Pain or neurologic symptomology during treatment
- Healing fracture
- Aneurysm
- Acute rheumatory conditions
- Hematoma
- Acute concussion

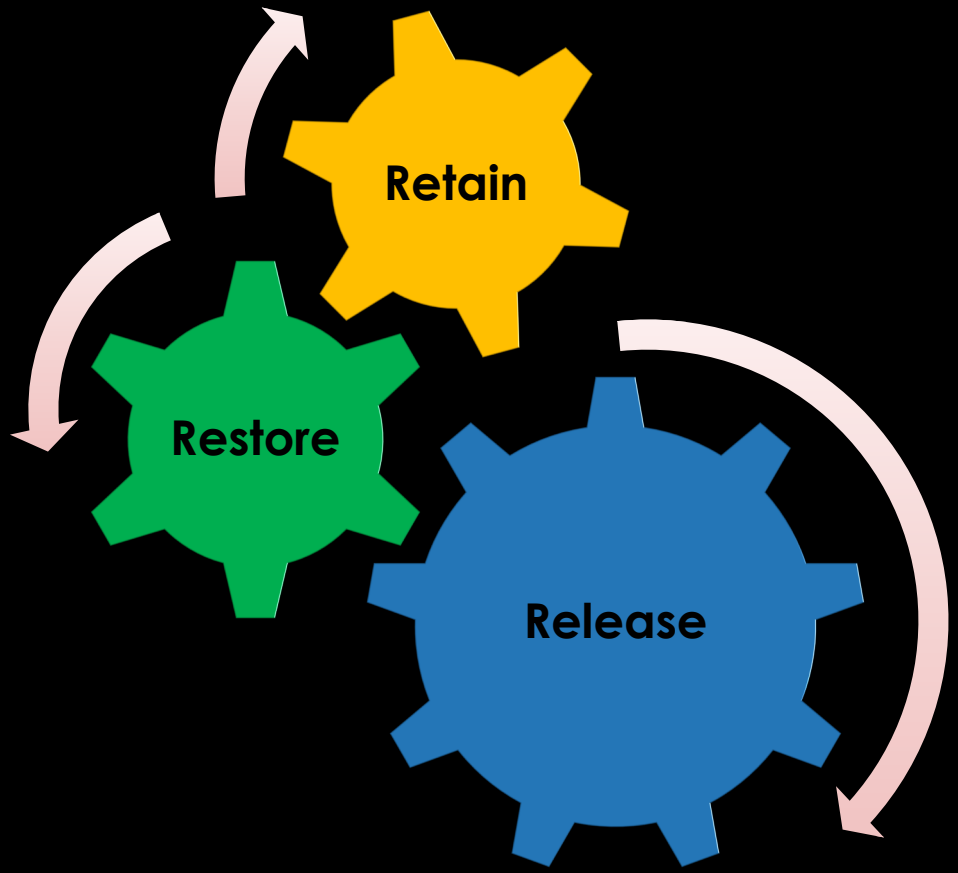
Relative

- Herniated disc
- Vertebral stenosis
- Sutures
- History of motor neuron disease

Precaution:

- Monitor the patient during marked cervical extension for vertebral artery compression signs.

ONE TOOL



The Three Rs' of Manual Therapy (Speicher, 2016)

QUIZ TIME

1. Strain Counterstrain (SCS) of the achilles tendon has been shown to significantly reduce the stretch reflex of the gastrocnemius and soleus, supporting which of the following somatic dysfunction theories?

A. Mechanical Coupling

B. Integrated Trigger Point Hypothesis

C. Energy Crisis

D. Proprioceptive

2. The application of strain counterstrain to the plantar fascia in the Wynne et al (2006) study demonstrated?

A. a temporary reduction in pain

B. a long lasting reduction in pain

C. no reduction in pain

D. a difference in reduction in pain between genders

3. Pain has been shown to significantly increase which type of gamma gain in both humans and animals?

A. Primary

B. Secondary

C. Static

D. Dynamic

QUIZ TIME

4. Which type of evidence provides for the greatest strength of recommendation?

A. Patient Oriented

B. Disease Oriented

C. Consensus Oriented

D. Opinion Oriented

5. The reduction in stretch reflex after application of a therapeutic intervention would be considered?

A. Disease oriented

B. Patient oriented

C. Consensus oriented

D. Opinion oriented

6. Strain counterstrain or positional release therapy has NOT been shown to significantly reduce pain in which of the following conditions?

A. Acute low back pain

B. Chronic low back pain

C. Acute torticollis

D. Bicep Tendiopathy

E. Hip Flexor Tendiopathy

QUIZ TIME

7. Significant improvements in strength have been shown to occur after the application of strain counterstrain and positional release therapy (PRT) at the:

A. Ankle

B. Knee

C. Shoulder

D. Elbow

8. Strain counterstrain to the jaw has been shown to significantly improve which of the following patient-oriented symptoms?

A. Pressure sensitivity

B. Quality of life

C. Strength

D. Cost

9. A Randomized control trial (RCT) of the application of PRT to healthy hamstrings showed a significant:

A. increase in range of motion

B. decrease in range of motion

C. increase in strength

D. decrease in strength

QUIZ TIME

10. Which of the following is NOT an indication for positional release therapy (PRT)?

A. Post concussive syndrome

B. Acute fracture

C. Central sensitization syndrome

D. Acute ankle pain

11. PRT is indicated for which of the following conditions?

A. Open wounds

B. Acute concussion

C. Fibromyalgia

D. Acute nerve root compression

12. Which of the following conditions would be contraindication for positional release therapy?

A. Deep vein thrombosis

B. Acute ankle sprain

C. Post concussive syndrome

D. Sciatica

QUIZ TIME

13. When would PRT be integrated into the treatment of a non-complicated acute ankle sprain?

A. Acute phase of the healing process

B. Sub-acute phase of the healing process

C. Repair phase of the healing process

D. Throughout the phases of the healing process

14. Which therapy modality would be complimentary to PRT that may optimize tissue extensibility?

A. Therapeutic ultrasound

B. Diathermy

C. Massage

D. All of the above

15. In order to optimize joint mobility with joint mobilizations, when is it advocated to perform PRT?

A. Prior to manipulation

B. During manipulation

C. After manipulation

D. Prior, during and after manipulation

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