CLINICAL REASONING FOR MANUAL THERAPY MANAGEMENT OF TENSION TYPE AND CERVICOGENIC HEADACHE

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Disclosure

• César Fernández-de-las-Peñas PT, PhD is the author of Tension-type and Cervicogenic Headache: Pathophysiology, Diagnosis and Management and receives royalties from the sale of this text.

• No other conflicts of interest exist

Objectives:
1. Appreciate the different clinical presentation of various headache types
2. Correlate clinical headache presentation with potential pain mechanisms.
3. Understand the effectiveness of physiotherapy in the management of tension type headache
4. Understand the effectiveness of physiotherapy in the management of cervicogenic headache
5. Observe and critically discuss selected manual therapy interventions for the management of tension-type headaches
Introduction

- Reported lifetime prevalence of **>90%** (Steiner 2014)
- National and international guidelines focus primarily on pharmacological management (Bendtsen 2010, Pryse-Phillips 1998)
- Increasing evidence for non-pharmacological management

Introduction

- Commonly seen in clinical practice by health care professionals – most common forms:
  - migraine
  - tension type
  - cervicogenic headache
- Associated with a high burden of suffering and considerable socioeconomic costs
Headache Classification
International Classification of Headache Disorders - II
Primary versus Secondary Headaches

• Primary:
  ▫ Migraine
  ▫ Tension-type (TTH)
  ▫ Cluster
  ▫ Other
• Secondary:
  ▫ Cervicogenic (ie, 2° to cervical spine dysfunction)

1. Migraine

1.1 Migraine without aura
1.2 Migraine with aura
1.3 Chronic migraine
1.4 Complications of migraine
1.5 Probable migraine
1.6 Episodic syndromes that may be associated with migraine

1.1 Migraine without aura
At least 5 attacks fulfilling criteria B-D

B. Attacks lasting 4-72 h

C. Has ≥2 characteristics:
  1. unilateral location
  2. pulsating quality
  3. moderate or severe pain intensity
  4. aggravated by or causes avoidance of routine physical activity (eg, walking, climbing stairs)

D. During headache ≥1 of the following:
  1. nausea and/or vomiting
  2. photophobia and phonophobia
Migraine with Aura

Aura
- Recurrent attacks, lasting minutes, of unilateral fully reversible visual, sensory or other central nervous system symptoms that usually develop gradually and are usually followed by headache and associated migraine symptoms.

Aura
- Visual aura is common but may also be sensory loss, weakness, dysphasia

Examples:
- Phosphenes: eg, sparks, flashes, geometric forms
- Scotoma: area of diminished vision moving across visual field
- Scintillating scotoma flickering spectrum at margin of scotoma

Migraine Management
- modification of risk factors
- treatment of associated comorbidities
- identification of medication overuse
- treatment of acute migraine attacks
- preventive therapy
- No evidence of benefit of manual therapy
  Carod-Artol 2012
Modifiable Risk Factors - Migraine

- Medication overuse
- Obesity
- Depression
- Stressful life events
- Snoring

Buse 2012

Tension Type Headache

- Most common type of H/A
- Overarching syndrome of ‘featureless’ headaches characterized by nothing but pain in the head
- Overlap between TTH and Migraine (s/a aura)
- Also overlap with fibromyalgia

Fernandez de las Penas 2009

Tension-type headache (TTH)

**Infrequent** episodic tension-type [<1 d/mo (<12 d/y)]

**Frequent** episodic tension-type [1-14 d/mo for >3 mo (>12 and <180 d/y)]

**Chronic** tension-type headache [≥15 d/mo on average for >3 mo (≥180 d/y)]
Episodic TTH: characterized by

- Lasting from 30 min to 7 d
- ≥2 of the following 4 characteristics:
  1. bilateral location
  2. pressing or tightening (non-pulsating) quality
  3. mild or moderate intensity
  4. not aggravated by routine physical activity
- Both of the following:
  1. no nausea or vomiting
  2. Not more than one of photophobia or phonophobia
- Sub-classified by +/- pericranial tenderness on manual palpation

Are migraine and tension-type headache diagnostic types or points on a severity continuum?

Turner et al (Pain) 2015

- Conceptualized 1° headache as a severity continuum
- supported for young adults (<24 y) and those with frequent headaches (>15 d/mo)
Similarities between TTH and Migraine

- Individuals with migraine often report TTH sx such as muscle tension and neck pain  
  Kaniecki 2001

- Individuals with (chronic) TTH often experience photophobia, phonophobia, and aggravation activity  
  Spierings 2001

- Report similar attack triggers  
  Woer 2010

- Both have higher rates of psychiatric comorbidities  
  Radat and Swendson 2004

Cervicogenic headache

- Headache caused by a disorder of the cervical spine and its component bony, disc and/or soft tissue elements  
- usually but not invariably accompanied by neck pain

Referred Pain - Stimulation of facet joint

Dwyer, April, Bogduk 1990

Referred pain by stimulating the facet (healthy subjects)  

Bogduk and Marshland 1988
EXAMINATION

Subjective information to assess

- Stress levels
- Sleep duration (Houle, Pain 2012)
  - Tools: Daily Stress Inventory, duration of previous night’s sleep
  - Two consecutive days: predictive of triggering headache
- Duration of headaches
- Frequency to headaches
- Do they have an aura?
- Intensity of headaches
- Effect of sustained postures?
- Unilateral? Side shift?

Central Sensitization as a component of chronic headache

- What are the clinical findings that suggest that the headache symptoms may be centrally mediated?
Hyperalgesia: Chronic Tension Type Headache

- Increased cephalic pain sensitivity as measured by the Total Tenderness Score
- Regional hyperalgesia found via pressure pain threshold (PPT) measures at the upper trapezius
  Fernandez de las Penas 2010, Ashina 2005
- No differences found at the Anterior Tibialis muscle
  Ashina 2005

Hyperalgesia: Cervicogenic Headache

- Lateralization of pressure hyperalgesia to the painful side of the head of CEH patients
- Accompanied by cold as well as warm relative hyperesthesia
  Chua 2011

Hyperalgesia: Chronic Migraine

- Generalized pressure pain hypersensitivity in the craniocervical region
  Harriott and Swedt 2014, Florencio 2015
- Cutaneous allodynia is a marker of central sensitization and an independent predictor for migraine chronification
  Cuadrado 2008, Louter 2013
Hypoesthesia with headache

- Few studies have addressed this question
- Possible clinical importance considering balance impairments found in headache population
- No deficit in vibrotactile thresholds in migraine

What about proprioception?

- No difference in Joint Reposition Error (kinesthesia) between healthy controls and persons with cervicogenic headache
  - Jull 2007, DeHertogh 2007
- JPE increased in persons with TTH
  - Marchand 2014

Differential Dx Headaches

- Important to perform a thorough examination to determine the type of headache

However,

- Many headaches sufferers demonstrate more than one type of headache
- Treatment may be directed at the pain mechanism
11. Headache or facial pain attributed to disorder of the cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cervical structure

11.1 Headache attributed to disorder of cranial bone
11.2 Headache attributed to disorder of the neck
11.2.1 Cervicogenic headache
11.2.2 Headache attributed to retropharyngeal tonsillitis
11.2.3 Headache attributed to craniocervical dystonia
Cervicogenic Headache

Diagnostic criteria:
A. Any headache fulfilling criterion C
B. Clinical, laboratory and/or imaging evidence of a disorder or lesion within the cervical spine or soft tissues of the neck, known to be able to cause headache
C. Evidence of causation demonstrated by at least two of the following:
   1. headache has developed in temporal relation to the onset of the cervical disorder or appearance of the lesion
   2. headache has significantly improved or resolved in parallel with improvement in or resolution of the cervical disorder or lesion
   3. cervical range of motion is reduced and headache is made significantly worse by provocative maneuvers
   4. headache is a bolus following diagnostic blockade of a cervical structure or its nerve supply
D. Not better accounted for by another ICHD-3 diagnosis.

Clinical tests of musculoskeletal dysfunction in the diagnosis of cervicogenic headache

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<th>Assessment</th>
<th>Domain</th>
<th>Clinical utility</th>
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<tr>
<td>Postural measurement</td>
<td>Eyes down angle (E/H)</td>
<td>Must-see post; forward head posture position</td>
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<tr>
<td>Pressure pain threshold</td>
<td>C4 transverse process</td>
<td>Pressure points associated with C4/E</td>
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<tr>
<td>Cervical range of movement</td>
<td>Flexion, extension, rotation</td>
<td>Cervical mobility associated with C3/C4</td>
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<tr>
<td>Motion palpation</td>
<td>Cervical rotation, rotator, transverse</td>
<td>Cervical mobility associated with C3/C4</td>
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<td>Muscle tenderness</td>
<td>Upper trapezius, suboccipital, C2/C3/C4</td>
<td>Anderson tender to touch and turn</td>
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<td>Metacarpophalangeal joint test</td>
<td>Pressure over C2, 5th cervical nerve</td>
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<tr>
<td>Cross-sectional nerve test</td>
<td>Flexion/plantar flexion, transverse, rotator, transverse, rotator, transverse</td>
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Cervical musculoskeletal impairment in frequent intermittent headache. Part 1: Subjects with single headaches


Table 3 The sensitivity and specificity of the physical measures to categorise cervicogenic headache from subjects with other headache types and control subjects (n = 150)

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<th>Original classification</th>
<th>Predicted membership</th>
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<tr>
<td></td>
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<tr>
<td>Specificity</td>
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</tbody>
</table>
Cervical musculoskeletal impairment in frequent intermittent headache. Part 2: Subjects with concurrent headache types

M Amir1,2, G Jull3, J Bullock-Saxton1, R Danell6 & C Lander6

Flexion-Rotation test

The flexion–rotation test and active cervical mobility—A comparative measurement study in cervicogenic headache

Reproduction of Headache Attack
Occipital headaches stemming from the lateral atlanto-axial (C1–2) joint


C Aprill, MJ Axim & N Begdikian

1Magruder Hospital, New Orleans, Louisiana, USA. 2Neurome Bone and Joint Institute, University of Newcastle, Newcastle, Australia

http://catedrdefisioterapia-temp.es
Therapeutic options for cervicogenic headache

César Fernández-de-las-Penas 1 and Maria L Cuadrado 2

1 Department of Physical Therapy, Occupational Therapy, Physiotherapy and Rehabilitation, University Rey Juan Carlos, Alcorcon, Madrid, Spain
2 Laboratory of Osteopathy, University of Alarcón, Alcorcon, Madrid, Spain

The term cervicogenic headache (CefH) describes a syndrome originating from the cervical spine. There is a variety of therapeutic approaches used for the management of CefH, but scientific evidence of their effectiveness is scarce. No medication drug has proven to be effective. The evidence for greater occipital nerve blocks, cervical nerve blocks, facet joint injections and surgical procedures is limited. Several physical therapy interventions are proposed for CefH, with spinal manipulation and soft tissue interventions being the most commonly used. However, the lack of solid evidence of positive effects and risks of serious complications for spinal manipulation should be considered in favor of other physical therapy interventions associated with less risk. The inconsistent results in the literature can be related to the fact that maybe not all therapeutic interventions are appropriate for all patients with CefH or maybe not all patients with CefH will benefit from particular interventions.

Keywords: cervicogenic headache • headache • manual therapy • neck • nerve block • physical therapy

Recent evidence suggests that the term cervicogenic headache is a misnomer and it is premature to conclude that all cases of headache associated with cervical spine pain are cervicogenic. Instead, it is likely that a variety of factors contribute to the development of headache in the cervical spine, including mechanical factors such as posture, alignment, and movement, as well as psychological factors such as stress and anxiety. It is important to note that the exact mechanism responsible for cervicogenic headache is still debated, and further research is needed to fully understand the pathophysiology of this condition.

Diseases (11.2, Headache attributed to disorders of the neck – 31.2.1 CefH, Rev. 1) (3)

Please estimate the incidence and prevalence of CefH differ according to the populations included and the diagnostic criteria used in epidemiological studies. The most accepted"
The concept that descriptions supposing to emanate from anatomical structures in the cervical spine can be referred to the occipital region and labeled a headache exist even having their basis reported in 1869 [1]. Lacking a clear and definitive definition, the condition is labeled for more than a century until the term cervicogenic headache (CCH) was coined and diagnostic criteria were defined [1,2]. Since that time, several interventions have been proposed for the treatment of CCH, including various types of medications, physical modalities, exercise, manual therapies, injections, and even a number of surgical procedures [3]. However, there has been a paucity of high-quality research supporting both the reliability of diagnosis and the quality of evidence with respect to benefits, harms, and costs. Although this review is understandable from a purely scientific perspective, it cannot easily be reconciled with the daily practice of health care in which clinicians, patients, and third-party payers attempt to make informed decisions about competing interventions using the best available evidence. These decisions revolve mainly around three questions that all stakeholders must consider when evaluating a specific treatment approach for a comparable clinical condition such as CCH. 1) When should a patient be offered? 2) What treatment is appropriate? and 3) How much of a treatment should be given?

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Tension Type Headache

**Diagnostic criteria:**

B. Lasting from 30 minutes to 7 days
C. At least two of the following four characteristics:
   1. bilateral location
   2. pressuring or tightening (non-pulsating) quality
   3. mild or moderate intensity
   4. not aggravated by routine physical activity such as walking or climbing stairs
D. Both of the following:
   1. no nausea or vomiting
   2. no more than one of photophobia or phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.

**IETTH (1 headaches/months)**

**FETTH (1-15 headaches/months)**

**CTTH (>15 headaches/months)**

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Muscle Referred Pain

CHAPTER 6

Muscle Trigger Points in Tension-Type Headache

César Fernández de las Peñas, PT, DPT, PhD; David C. Simone, MD; Robert D. Gewin, MD; Maria L. Cuadrado, MD, PhD, and Juan A. Panja, MD, PhD
Referral pain from trapezius muscle trigger points shares similar
c characteristics with chronic tension type headache
César Fernández-de-las-Peñas a,⁎, Hong-You Ge b, Lars Arendt-Nielsen b,
María Luz Cuadrado c, Juan A. Pareja c
http://catedrafisioterapia-tmps.es

Trigger Points in the Suboccipital Muscles and Forward Head
Posture in Tension-Type Headache
César Fernández-de-las-Peñas, PT; Cristina Alonso-Blanco, PT; María Luz Cuadrado, MD, PhD;
Robert D. Gerwin, MD; Juan A. Pareja. (Headache 2006;46:454–460)
http://catedrafisioterapia-tmps.es
Myofascial Trigger Points and Their Relationship to Headache Clinical Parameters in Chronic Tension-Type Headache

César Fernández-de-las-Peñas, PT; Cristina Alonso-Blanco, PT; Maria Luz Cuadrado, MD, PhD; Robert D. Gerwin, MD; Juan A. Pareja, MD, PhD

http://catedradefisioterapia-tmps.es

The Local and Referred Pain From Myofascial Trigger Points in the Temporalis Muscle Contributes to Pain Profile in Chronic Tension-type Headache

César Fernández-de-las-Peñas, PT, PhD,§† Hong-You Ge, MD, PhD,‡ Lars Arendt-Nielsen, DMSc, PhD,‡ Maria Luz Cuadrado, MD, PhD,‡§ and Juan A. Pareja, MD, PhD‡§ (Cephalalgia 2017;27:380–382)

http://catedradefisioterapia-tmps.es

Myofascial trigger points and sensitization: an updated pain model for tension-type headache

C Fernández-de-las-Peñas,§§ ML Cuadrado,§§ I Arendt-Nielsen,§ DG Simons§ & JA Pareja§§

Cephalalgia

Evidence for the Effectiveness of Physiotherapies for Tension-Type Headache

Emilio “Louie” Puenteudur, PT, DPT, PhD
Board Certified Specialist in Orthopedic Physical Therapy
Fellow of the American Academy of Orthopedic Manual Physical Therapy

8 studies reviewed – only 2 considered high quality
“Because of clinical heterogeneity and poor methodological quality in many studies – not possible to draw valid conclusions”
Conclusion: Insufficient evidence to either support or refute effectiveness of physiotherapy and manipulation in patients with TTH

The effectiveness of physiotherapy and manipulation in patients with tension-type headache: a systematic review

Marie-Louise B. Lemmens*†, Liliane Damme*§, Adriene P. Verhagen*, Marijke Y. Berger*, Jan Piafsch*, Bart W. Koes*

• 6 studies reviewed
• PEDro quality scores 5.8 ± 2.1 (2 – 8) on 10 point scale
• Conclusion: No rigorous evidence that manual therapies have a positive effect on TTH

Are Manual Therapies Effective in Reducing Pain From Tension-Type Headache? A Systematic Review

Cesar Fernandez-de-las-Peñas, PT††, Cristina Alonso-Blanco, PT, † † María Luisa Combaño, MD, PA**; Juan Carlos Montalvo, MD, PA**, Francisco J. Borrego, MD, PhD† and Juan A. Perea, MD, PhD**

Effectiveness of Physical Therapy in Patients with Tension-type Headache: Literature Review

- 9 studies reviewed
- All studies used a combination of different techniques and non-analyzed treatments separately.
- **Conclusion:** Evidence that physiotherapy with articulatory manual therapy, combined with cervical muscle stretching and massage are effective in patients with TTH

Evidence for the use of dry needling and physiotherapy in the management of cervicogenic or tension-type headache: A systematic review

- 3 studies reviewed
- All 3 showed statistically significant improvements following dry needling, but no significant differences between groups.
- **Conclusion:** Insufficient evidence to strongly advocate for the use of dry needling

EFNS guideline on the treatment of tension-type headache – Report of an EFNS task force

- Non-drug management should always be considered although the scientific basis is limited.
- **Conclusion:** Physical therapy and acupuncture may be valuable options for patients with frequent TTH, but there is no robust scientific evidence for efficacy.
• Few published RCTs on effectiveness of spinal manipulation and/or mobilization for TTH, M and CeH
• Methodological quality of these papers typically low
• There is a need for high-quality RCTs assessing the effectiveness of these interventions in these headache disorders
Treatment of tension-type headache with articulatory and suboccipital soft tissue therapy: A double-blind, randomized, placebo-controlled clinical trial

- 84 patients with episodic TTH and chronic TTH
- All patients assessed baseline, 4 and 8 weeks
  - Headache Impact Test-6 (36 – 78 points)
  - Headache Disability Inventory (0 – 100 points)
  - Headache Pain Intensity (0 – 10 points)
  - Craniocervical ROM with CROM device
  - Headache Diary

Results:
- SI effective in ↓ impact of HA and ↑ Craniocervical flexion
- OAA manip effective in ↓ impact of HA, frequency and intensity of HA and ↑ Craniocervical flexion and extension
- Combined SI and OAA more effective than each treatment separately
Clinically: The STORY...

A simpler approach to Headaches

1. Tension-Type
2. Cervicogenic
3. Migraine
Trigeminal Cervical Nucleus (TCN)

The TCN as a container
Tension-Type Headache


Tension-Type Headache

Vascular input

Supra-spinal input

Trigeminal Nucleus Caudalis

Myofascial input

Tension Type Headache

TTH: But there’s more...

ELECTRICAL ACTIVITY

TIME

FIRING LEVEL

EXTRA SENSITIVE

NORMAL EXCITED LEVEL

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TTH: Central Sensitization...

- Increased sensitivity due to HA
- Headache causes central sensitivity and not the other way around.

TTH: Trigger Points

1. Tender spot in a taut band
2. Positive twitch response
3. Referred pain
TTH End Result?

- Trigger points = major cause of TTH
- 100% of TTH patients have trigger points in the sub-occipital muscles
- 70% of the trigger points reproduce the exact same symptoms as the TTH
1. Suboccipital

2. Temporalis

3. Sternocleidomastoid
4. Upper Trapezius

Keep this in mind:

- **Nerve Supply**
  - Sub-occipital: C1
  - Temporalis: Trigeminal
  - SCM: Accessory
  - Upper Trapezius: Accessory

TTH: CNS Connection

- **Disinhibition**
  - (Inhibition of the Inhibition System)
  - Central Sensitization
TTH: The Brain Changes

The Key in HA is the TCN (view it as a container)
Disclosure Slide

• No relevant relationship exists.

Objectives

• Identify impairments associated with CGH
• Recognize recommendations of clinical practice guidelines for the management of CGH
• Understand the effectiveness of manual therapy in the management of CGH
• Recognize appropriate co-interventions that can potentially augment manual therapy for patients with CGH.
Non-invasive physical treatments for chronic/recurrent headache

[Bronfort, G; Nilsson, N; Heac, M; Evans, R; Goldsmith, CH; Assendelft, WJJ; Bouter, LM]

Date of Most Recent Update: 15-June-2004
Date of Most Recent Substantive Update: 25-May-2004

For the prophylactic treatment of cervicogenic headache, there is evidence from a high-quality study that both neck exercise (low-intensity endurance training) and spinal manipulation are effective in reducing headache intensity and frequency in the short and long term in comparison to no treatment. Except for reduction in headache duration, there is no advantage to combining these two therapies. From two more high-quality studies there is evidence that spinal manipulation is effective in the short term in improving pain and other secondary headache outcomes in comparison to massage or placebo spinal manipulation. Weaker evidence from a lower-quality study showed that spinal manipulation was more effective for pain reduction in the short term than spinal mobilization or no treatment.

### Clinical Guidelines

**Neck Pain:**

Clinical Practice Guidelines linked to the International Classification of Functioning, Disability, and Health: the Orthopedic Section

Physical Therapy

**Interventions - Cervical mobilization/manipulation:**

Clinicians should consider utilizing cervical manipulation and mobilization procedures, direct and non-direct, to reduce neck pain and headache. Combining cervical manipulation and mobilization with exercise is more effective for reducing neck pain, headache, and disability than manipulation and mobilization alone. (Recommendation based on strong evidence.)

**Interventions - Coordination, Strengthening, and Endurance Exercises:**

Clinicians should consider the use of coordination, strengthening, and endurance exercises to reduce neck pain and headache. (Recommendation based on strong evidence.)

### Systematic Review

Conservative physical therapy management for the treatment of cervicogenic headache: a systematic review

**Stephanie Racicki, Sarah Gerwin, Stacy DiClaudio, Samuel Reimnann, Megan Donaldson**

Department of Physical Therapy, Walsh University, North Canton, OH, USA

Conclusion: Calculated effect sizes allowed comparison of intervention groups between studies. A combination of therapist-driven cervical manipulation and mobilization with cervico-oculopelvic strengthening was most effective for decreasing pain outcomes in those with CSH.
So what should we as PTs do with this population?

The term cervicogenic headache (CCH) describes a syndrome originating from the cervical spine. There are a variety of therapeutic approaches used for the management of CCH, but scientific evidence of their effectiveness is scarce. No medication has proven to be effective. The evidence for cervical spinal nerve blocks, cervical nerve blocks, facet joint injections, and other pharmacological therapies is limited. The portion of the population that is severely affected by CCH is too small for effective pharmacological and non-pharmacological interventions. The literature is not consistent, and the treatment of cervicogenic headache remains controversial. The lack of validated evidence of the effectiveness and safety of various conservative treatment options for CCH, such as manipulative treatment and soft tissue interventions being the main approach, is not consistently supported by evidence. However, when considering various conservative treatment options for CCH, one should be guided by the fact that many patients with CCH may not be candidates for surgical therapies. The current literature on the subject is not aligned with the common belief that many patients with CCH will benefit from various conservative interventions.
Nilsson 1997

- Compared manipulative therapy to soft-tissue therapy and laser to the upper cervical region in chronic CGH sufferers
  - ≥ 5 HA/month for at least 3 months

- Manipulation group had better results
  - Headache hours per day
  - Headache intensity
  - Decrease in analgesic use

A Randomized Controlled Trial of Exercise and Manipulative Therapy for Cervicogenic Headache

- Subjects:
  - 200 Patients with cervicogenic headaches
- Randomized to 1 of 4 treatment groups
  - Manual Therapy
  - Exercise Therapy
  - Manual Therapy + Exercise
  - Control

- Duration
  - 6 wks treatment (8-12 visits)
  - Follow up 7 weeks, 3, 6 and 12 months.

- Outcomes
  - HA Frequency, duration and intensity
  - Success defined as >50% HA frequency
  - Neck pain and disability
  - Pain with neck movements or palpation
  - Posture
  - Cranio-Cervical Flexion Test (CCFT)

*SPINE Volume 27, Number 17, pp 1835–1843*

Treatment

1. Manipulative therapy: thrust and/or non-thrust procedures for the cervical spine
2. Therapeutic Exercise (deep neck flexor, common scapular stabilization, stretching, and postural correction exercises)
3. Combination of first two groups on same day
4. Control (no PT intervention)

* 8-12 treatment sessions over six weeks*
Change in pain scores (VAS)

Frequency of Headache

Duration of Headache

Outcomes - Jull et al. Spine. 2002
Percentage of subjects seeking additional treatment within 1 year

Results

Change in pain scores (VAS)

What did they do for manual therapy?
Safety of cervical spine manipulation: are adverse events preventable and are manipulations being performed appropriately? A review of 134 case reports

Authors: Ovilo (P) Pamela, Joseph Macari, Joe Asilok, Adder Perez, and R. Landers. Harvey W. Whyman, and Joshua A. Cleander

Source: Journal of Manipulative & Physiological Therapeutics

Abstract:

Background: Cervical spine manipulation (CSM) is a commonly utilized intervention, but its use remains controversial. Purpose: To retrospectively analyze all available documented cases in the literature describing patients who had experienced severe adverse events (AEs) after receiving CSM to determine if the CSM was used appropriately, and if these types of AEs could have been prevented using sound clinical reasoning on the part of the clinician. Data sources: Published and the Cumulative Index to Nursing and Allied Health were systematically searched for case reports between 1950 and 2013 of AEs following CSM. Study selection: Case reports were included if they were peer-reviewed, published between 1950 and 2013, case reports or case series, and had CSM as an intervention. Articles were excluded if the AE occurred without CSM or p. spontaneous or by other medical condition. Data extracted from each case report included gender, age, who performed the CSM and why, presence of contraindications, number of manipulation interventions performed, initial symptoms experienced after the CSM, and type of resolved AE. Data synthesis: Based on the information gathered, CSMs were categorized as appropriate or inappropriate, and

Distribution of cases categorized by appropriateness and preventability

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<th>Inappropriate</th>
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<td>93.9%</td>
<td>7.2%</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>78.3%</td>
<td>21.7%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80.6%</td>
<td>19.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Risk Benefit Ratio

<table>
<thead>
<tr>
<th>Risk</th>
<th>Benefit</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (more than three risk factors)</td>
<td>Low predicted benefit of manual therapy</td>
<td>Avoid treatment</td>
</tr>
<tr>
<td>Moderate number / moderate nature of risk factors</td>
<td>Moderate predicted benefit of manual therapy</td>
<td>Avoid or delay treatment / monitor and reassess</td>
</tr>
<tr>
<td>Low number / low nature of risk factors</td>
<td>Low / moderate / high predicted benefit of manual therapy</td>
<td>Treat with care / continual monitoring for change in symptoms</td>
</tr>
</tbody>
</table>

Efficacy of a C1-C2 Self-sustained Natural Apophysyal Glide (SNAG) in the Management of Cervicogenic Headache

32 patients with CGH

SNAG  Placebo
RCT: Self Mobilizations

- Subjects: 32 individuals with cervicogenic headaches
- Treatment Groups (12 week HEP)
  - C1-2 Self Snag
  - Placebo Self Snag
- Outcomes
  - Immediate change in Flexion-rotation test ROM of 15 degrees (p<0.001)
  - Significant decrease in Headache Severity index at 4 weeks and 12 months follow up

Hall et al. JOSPT. 2007

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
<th>Change Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM (mm)</td>
<td>40.5±10</td>
<td>27.5±4.6*</td>
</tr>
<tr>
<td>SS (°)</td>
<td>3.7±3.7</td>
<td>3.6±1.7</td>
</tr>
<tr>
<td>NO (°)</td>
<td>37.5±5.4</td>
<td>25.5±4.5</td>
</tr>
</tbody>
</table>

* p<0.05, ** p<0.01 from post to 0 to 4 months between the two groups: SNAG, Self-Neurodynamics Approach Glide; NO, Visual Analog Scale; NO, Headache Severity/Disability Index.

40 patients with neck pain

SNAG  Placebo

- Okay so we treated 32 patients now what about these?
Manual Treatment for Cervicogenic Headache and Active Trigger Point in the Sternocleidomastoid Muscle: A Pilot Randomized Clinical Trial

Cerri Bodino-Pardo, PT, MS,1,2 Daniel Pezo-Marín, PT, PhD,1 Tomás Callejo-Izquierdo, PT, PhD,1 Jaime Selva-Perez, PT, MSc,1 César Fernández de León-Pérez, PT, PhD,1 and Ricardo Ontañón Santiago, PT, PhD1

Table 1: Maximal pain intensity and change scores for headache severity, neck pain, and cervicobrachial pain test

<table>
<thead>
<tr>
<th>Technique</th>
<th>Maximal Pain Intensity</th>
<th>Change Score</th>
<th>Group Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual TrP</td>
<td>12/10</td>
<td>-4/4 (4)</td>
<td>5/1/4, 3/4</td>
</tr>
<tr>
<td>Simulated TrP</td>
<td>12/10</td>
<td>-4/4 (4)</td>
<td>5/1/4, 3/4</td>
</tr>
</tbody>
</table>

Summary

Choose a Technique Based on Clinical Reasoning

Should be based on comprehensive neurophysiologic paradigm
Aim at Painful Areas

- Or at areas that you think are related to a patient’s symptoms

Use Examination Procedures that are Reliable and Relevant

Choosing Co-intervention
Adamantly Pretest-Posttest

- Assess asterisk/comparable sign
  - At baseline
  - After each intervention
  - At the end of the session
  - At the beginning of the next session

Thanks!