EVIDENCE BASED EXAMINATION AND MANAGEMENT OF CERVICOGENIC HEADACHE

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PhysicalTherapy.com

COURSE OBJECTIVES

- After this course, attendees will describe the prevalence and epidemiology of cervicogenic headache.
- Following this course, learners will describe evidence based examination techniques to determine a clinical diagnosis of cervicogenic headache and differential diagnosis from tension type and migraine headaches.
- Following this course, attendees will list appropriate manual therapy techniques and exercises useful in the care of patients with cervicogenic headache.

TREATMENT BASED CLASSIFICATION

Journal of Orthopaedic & Sports Physical Therapy
Proposal of a Classification System for Patients With Neck Pain

<table>
<thead>
<tr>
<th>Mobilization</th>
<th>Centralization</th>
<th>Strengthening and Conditioning</th>
<th>Headaches</th>
<th>Reduce Pain</th>
</tr>
</thead>
</table>

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- Following this course, learners will describe evidence based examination techniques to determine a clinical diagnosis of cervicogenic headache and differential diagnosis from tension type and migraine headaches.
- Following this course, attendees will list appropriate manual therapy techniques and exercises useful in the care of patients with cervicogenic headache.
TREATMENT BASED CLASSIFICATION

- Unilateral-dominant headache with neck pain
- Associated with neck movement or position
- Tenderness in upper cervical spine
- No migraine history or symptoms

Cervical Strengthening
Upper Cervical Mobilization
Postural/Upper quarter retraining

CLINICAL PRACTICE GUIDELINES

BRIEF STATISTICS REVIEW

Statistics may be defined as "a body of methods for making wise decisions in the face of uncertainty."
-W.A. Wallis
**RELIABILITY**

Used for inter and intra rater reliability

**Intra-class correlation coefficient (ICC)**
Continuous data e.g. ROM

**Kappa (κ)**
Categorical data e.g. +/-

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**LEVELS OF RELIABILITY**

<table>
<thead>
<tr>
<th>ICC</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.50 = poor</td>
<td>0-0.1 = Poor</td>
</tr>
<tr>
<td>0.50-0.75 = moderate</td>
<td>0.1-0.30 = slight</td>
</tr>
<tr>
<td>0.75-1.0 = good</td>
<td>0.31-0.40 = fair</td>
</tr>
<tr>
<td></td>
<td>0.41-0.60 = moderate</td>
</tr>
<tr>
<td></td>
<td>0.61-0.80 = substantial</td>
</tr>
<tr>
<td></td>
<td>0.81-1.0 = almost perfect</td>
</tr>
</tbody>
</table>

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**DIAGNOSTIC ACCURACY**

- Each time a clinical test is performed we must understand how the results of the test relate to the truth

  - **True Outcomes**
    - True Positive
    - True Negative
  - **False Outcomes**
    - False Positive
    - False Negative
**Sensitivity**

Tests ability to obtain a positive test when the target condition is really present

- **Highly** sensitive tests are best for **RULING OUT**
  - Low rate of false negatives
  - A negative on a highly sensitive test is most likely a true negative

**Specificity**

Tests ability to obtain a negative test result when the target condition is really absent

- **Highly** specific tests are best for **RULING IN**
  - Low rate of false positives
  - A positive on a highly specific test is most likely a true positive
**SPECIFICITY**

- **Sp**  Highly specific
- **P**  Positive
- **In**  Rule In

**SpPIn**

**LIKELIHOOD RATIOS**

The best method for summarizing the usefulness of a diagnostic test

Reflects a combination of the information contained in sensitivity and specificity into a ratio that can be used to quantify shifts in probability

**LIKELIHOOD RATIOS**

- **Positive** Likelihood Ratio (+LR)
  - MORE likely to having a condition

- **Negative** Likelihood Ratio (−LR)
  - LESS likely to having a condition
**INTERPRETATION OF LRS**

<table>
<thead>
<tr>
<th>Positive LR</th>
<th>Negative LR</th>
<th>Interpretation Ratio (shift in probability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10</td>
<td>&lt;0.1</td>
<td>Large</td>
</tr>
<tr>
<td>5-10</td>
<td>0.1-0.2</td>
<td>Moderate</td>
</tr>
<tr>
<td>2-5</td>
<td>0.2-0.5</td>
<td>Small</td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
<td>Rarely important</td>
</tr>
<tr>
<td>1</td>
<td>1.0</td>
<td>Not important</td>
</tr>
</tbody>
</table>

**HEADACHE OVERVIEW**

- Common, debilitating condition
- Poor quality of life with reduced daily function, limitation of social participation & emotional distress
  - Diener, 2001
- Significant cost burden
  - 20% of all lost workdays
    - Jensen, 2004
  - 19th on list of leading disorders for disability adjusted life years
  - 12th on list for women for years lived with disability
    - WHO, 2004

**HEADACHE PREVALENCE**

- Lifetime prevalence of 99% in women and 94% in men
  - Rasmussen, 1991
- 51% of general population suffered headache in previous year
  - Migraine 14%
  - Tension 46%
  - Cluster 0.3%
    - Stovner, 2007
- Lifetime prevalence of Cervicogenic Headache (CGH)
  - 4.1%
    - Sjaastad, 2007
HEADACHE

- Most common frequent intermittent headache presenting to primary care
- Migraine without aura
- Tension type headache
- Cervicogenic headache
- Medication overuse headache
  - Steiner et al, 2007; Sjaastad & Bakketeig, 2008

CLASSIFICATION OF HEADACHE DISORDERS (2004)

International Headache Society
Headache Classification Committee
3 Major Classifications
- Primary
  - Headache with no apparent identifiable cause
- Secondary
  - Headache associated with secondary pathology
    - Infection, tumor, stroke
- Cranial Neuralgias, Central and Primary Facial Pain and Other Headaches
  - Headache related to neural disorders of the head and neck

CLASSIFICATION OF HEADACHE DISORDERS (2004)

- Primary Headache
  - Migraine
  - Tension-Type Headache
  - Cluster Headache and other Trigeminal Autonomic Cephalgias
  - Other primary headaches
CLASSIFICATION OF HEADACHE DISORDERS (2004)

- Secondary Headaches
  - HA attributed to head/neck trauma
  - HA attributed to cranial/cervical vascular disorder
  - HA attributed to non-vascular intracranial disorders
  - HA attributed to substance or its withdrawal
  - HA attributed to infection
  - HA attributed to disorder of homeostasis
  - HA or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cranial structures
  - HA attributed to psychiatric disorder

HEADACHE DIAGNOSIS

- Common benign headaches may be difficult to diagnose based on symptoms alone
  - 70% of patients with frequent intermittent headache have neck pain
    - Henry, 1987
  - 64% of patients with migraines complained of neck pain during headache attack
    - Blau, 1994

MIGRAINE DIAGNOSIS

- HIS Criteria, 2004
  - Migraine without aura
    - Lasting 4-72 hours
    - At least two of the following
      - Unilateral location
      - Pulsating quality
      - Moderate to severe pain intensity
      - Aggravation by or avoids routine physical activity
    - At least one of the following
      - Nausea and/or vomiting
      - Photophobia and phonophobia
TENSION TYPE HEADACHE

- Highest prevalence of primary headache (30-78%)
- Highest socioeconomic impact, most costly to society
- Jensen, 1999, 2005
- Controversial- EMG unchanged during headache
- Miller, 2002
- Permanently altered muscle hardness on palpation
- Ashina, 1999
- Pathophysiology unknown, neurobiological basis
- Peripheral and central mechanisms
  - Nitric oxide plays a role- infusion/blocking
  - Ashina, 1999, 2000

DIAGNOSIS TENSION-TYPE HEADACHE

- HIS Criteria, 2004
  - At least two of the following
    - Pressing or tightening (non-pulsating) quality
    - Mild to moderate intensity (non-prohibitive)
    - Bilateral location
    - No aggravation from walking, stairs, or routine activities
  - Both of the following
    - No nausea or vomiting
    - Photophobia and phonophobia absent, or only one present

CLUSTER HEADACHE/ TRIGEMINAL AUTONOMIC CEPHALGIAS

- Cluster Headache
  - Severe headache, strictly unilateral
  - Orbital, supraorbital, temporal
  - Cluster then symptom free periods
  - Short-lasting 15-80 min
  - Frequent, every 2nd day to 8 times per day
  - Associated with
    - Lacrimation
    - Nasal congestion
    - Rhinorrhea
    - Forehead and facial swelling
    - Puffiness
  - Age 20-40, male 4x>female
CLUSTER HEADACHE/ TRIGEMINAL AUTONOMIC CEPHALGIAS

POTENTIAL NECK STRUCTURES ASSOCIATED WITH HEADACHE

- Joints
  - Sub-chondral bone, ligaments, capsules, intra and extra articular soft tissues
- Muscles
  - Upper trapezius, semispinalis, splenius, longissimus capitis, SCM, levator scapulae
- Neural Structures
  - Cervical dura, Spinal nerves C1-3, Greater Occipital Nerve

PREVALENCE OF CGH

- Headache Population
  - 15-20%
    - 112 headache patients: 17% CGH (Niere, 1998)
    - 18% of those with frequent headache (Nilsson, 1995)
- Physiotherapy practice
  - 111 headache patients
    - 36% CGH
    - 30% TTH
    - 7% Migraine without aura
      - Quin & Niere, 2001
Prevalence of CGH

- 5520 primary headache sufferers
- 13.8% CGH
- 198 headache subjects
  - 45% single type
  - 20% CGH
  - 20% Migraine
  - 5% Migraine aura
  - 38% tension-type
  - Jul. 2007
  - 55% mixed

Proposed Etiology of CGH

- Bogduk
- "Convergence of sensory input from the upper cervical spine into the trigeminal spinal nucleus"
- Upper cervical facets
- Upper cervical muscles
- C2-3 intervertebral disc

Facet Joint Referral
**DIAGNOSIS OF CGH**

- CGH International Study Group, 1998

**Major Criteria**

1. Symptoms & signs of neck involvement
   - Precipitation of headache by:
     - Neck movement or sustained awkward postures and/or
     - External pressure over the upper/occipital region, symptomatic side
   - Restriction of neck ROM
   - Ipsilateral neck, shoulder, or vague arm pain

2. Confirmatory evidence of diagnostic block

3. Side dominant headache without side-shift

**4. Head pain characteristics**

- Moderate-severe, non-throbbing, non-clustering. Pain starts in neck and spreads to head
- Varying duration, usually lasts longer than migraine headache
- Long term fluctuating pattern, becoming continuous when chronic

**5. Other characteristics of importance**

- Marginal effect of medication
- Not infrequent occurrence of head or indirect trauma, usually of more than only medium severity

**Reliability of classification**

- K = 0.83
- Van Suijlekom, 1999

- If 7 or more criteria present
  - CGH distinguished from migraine and TTH with high sensitivity and moderate specificity

- If pain is first experienced in neck and then spreads to frontal region and is unilateral
  - High likelihood of CGH
  - Vincent, 1998
CGH IDENTIFICATION

- Combination of limitation of active movement, craniocervical muscle dysfunction and pain on palpation C0-4
  - 100% sensitivity
  - 94% specificity
  - +LR=94
  - -LR=0.06

In isolating CGH from control, migraine, and TTH
  - Jull, 2007

DIFFERENTIAL DIAGNOSIS

- Diagnosis based on:
  - Subjective features
  - Physical examination
  - Exclusion of other headache forms
  - Red and yellow flags
### Features of CGH

<table>
<thead>
<tr>
<th></th>
<th>Migraine</th>
<th>CGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache ratio</td>
<td>1:2 Female/Male</td>
<td>1:1 Male/Male</td>
</tr>
<tr>
<td>Age at onset</td>
<td>80 years</td>
<td>35 years</td>
</tr>
<tr>
<td>Headache onset</td>
<td>Continuous</td>
<td>Posterior headache</td>
</tr>
<tr>
<td>Pain area</td>
<td>50% unilateral</td>
<td>Two-waxing, unilateral</td>
</tr>
<tr>
<td>Headache</td>
<td>Frequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Pain on pharyngolarynx</td>
<td>Very frequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Triggering pain</td>
<td>Frequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Headache on pain</td>
<td>Very frequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Migraine rash</td>
<td>Usually hospital</td>
<td>Brief hospital</td>
</tr>
<tr>
<td>Neck tension,omission</td>
<td>Rare</td>
<td>Rare</td>
</tr>
</tbody>
</table>

### Red Flag Screening

- Vascular
  - Internal carotid, vertebral artery
- Ligament rupture, laxity
- Atlantoaxial, tectorial membrane
- Congenital malformation
  - Odontoid, klippel-Feil deformity
- Tumor
- Cord Compromise
**RED FLAGS**
- Sudden onset of severe headache or sub-acute HA increasing over a few days
- New or unaccustomed headache
- Atypical headache or a change in the usual pattern of headache
- HA not associated with identifiable etiology
- Stiff neck or signs of meningism
- Systemic symptoms (weight loss, fever, malaise)
- Neurologic symptoms or signs or changes in consciousness
- Local extracranial symptoms (sinus, ear, eye disease)
- Temporal HA, onset after 50 yrs of age
- Moderate or severe headache triggered by cough, exertion, or bearing down
- New onset of headache during or following pregnancy

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**SUBJECTIVE HISTORY**
- Headache - Average days per week
- Headache - Average number per day
- Average headache duration
- Days in a row free from headache
- Symptoms getting better, worse, same
- Initial onset of symptoms
- Bilateral vs. unilateral
- Where does the pain begin
- Aggravating/Relieving factors
- Presence of aura

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**HEADACHE DIARY**
- Date, Time started, Time ended
- Warrning signs
- Description of pain
- Intensity of pain
- Location
- Medication taken and effect
- Hours of sleep
- Eating habits
- Prior activity
**Objective Examination**

- Posture
- Active movement
- Combined movement
- Joint mobility assessment
- Neural tissue tests
- Muscle function
- Special tests

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**Neurological Examination**

- Abnormality of gait
- Muscle strength
  - C1 & 2: Occipital depression
  - C2 & 3: Cervical depression
  - C3 & 4: Shoulder girdle elevation
  - C5: Neurotrophic
  - C5 & 6: Elbow flexion
  - C6: Wrist extension
  - C7: Elbow extension
  - T1: 5th finger abduction

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**Neurological Examination**

- Reflexes
  - C2/4: Upper trapezius
  - C4: Biceps
  - C5/6: Brachioradialis
  - C6: Triceps
  - C7: Tendons

- Upper Motor Neuron
  - Bilateral: Under the lateral border of the foot from the calcaneus to head of the 1st metatarsal. An normal strong plantar reflex is a positive sign, which is absent in lower motor neuron lesions. A diminished or absent reflex may indicate a lower motor neuron lesion.
NEUROLOGICAL EXAMINATION
- Sensation
  - Light touch
  - Pain
    - Pin wheel/ Pin prick

ACTIVE MOVEMENT
- Rotation
  - Total
  - Regional
  - Segmental
- Extension
  - Total
  - Regional
- Flexion
  - Total
  - Regional

JOINT MOBILITY ASSESSMENT
- Passive Accessory Intervertebral Movement
  - Pain provocation test
  - Central and unilateral pressures
  - Transverse pressures
RELIABILITY PIVM

<table>
<thead>
<tr>
<th>Joint Mobility Assessment</th>
<th>Range (mm)</th>
<th>Agreement</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive Physiological Intervertebral Movement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral flexion</td>
<td>0.1-1.5</td>
<td>0.1-1.5</td>
<td>0.1-1.5</td>
</tr>
<tr>
<td>Flexion/extension</td>
<td>0.1-1.5</td>
<td>0.1-1.5</td>
<td>0.1-1.5</td>
</tr>
</tbody>
</table>

Firmly grasp the head and occiput
Rotate left or right to approximately 30 degrees
Perform upper cervical flexion and extension or lateral flexion
Assess the range and quality of motion

JOINT MOBILITY ASSESSMENT

○ Passive Physiological Intervertebral Movement

○ C0-1
  ○ Lateral flexion
  ○ Flexion/extension

Firmly grasp the head and occiput
Rotate left or right to approximately 30 degrees
Perform upper cervical flexion and extension or lateral flexion
Assess the range and quality of motion

JOINT MOBILITY ASSESSMENT

○ Passive Physiological Intervertebral Movement

○ C1-2

Firmly grasp the head and occiput
Flex cervical spine 30
Perform upper cervical rotation
Assess the range and quality of motion
FLEXION ROTATION TEST

- Segmental dysfunction at C1-2
- Neck and upper thoracic spine is maximally flexed
- Assessment for
  - Loss of movement
    - Normal motion is 45 degrees to each side
    - Limitation greater than 10 degrees is abnormal
  - MDC 6 degrees (Hall and Robinson, 2009)
- Pain provocation
- Increase in resistance
- Hall and Robinson, 2004; Ogince 2007; Smith, 2008; Hall, 2008

FLEXION ROTATION TEST

- Diagnostic Accuracy
- Hall
  - Sensitivity= 0.86
  - Specificity= 1.00
  - +LR= NA
  - -LR= 0.14
- Ogince
  - Sensitivity= 0.91
  - Specificity= 0.90
  - +LR= 9.1
  - -LR= 0.1

MUSCULAR ASSESSMENT

- Cervical spine inherently unstable
- Many muscles contribute to dynamic stability
- Cervical dysfunction associated with deep neck flexor and extensor
- Reduced strength
- Endurance
- Control
MUSCULAR DYSFUNCTION
- Cervical extensors
  - Fatty infiltration
  - Atrophy
    - Andrey, 1998; Hallgren 1994; McPartland, 1999
  - Reduced cross sectional area multifidus
    - Kristjansson, 2003
    - Noteboom
    - Elliot

MUSCULAR DYSFUNCTION
- Cervical deep neck flexors
  - Longus colli
  - Longus capitus
  - Rectus capitus anterior

ASSESSMENT
- Craniocervical flexion test
  - Action of DNF is to nod chin towards throat
  - Avoid superficial muscle action (SCM and hyoids)
**ASSESSMENT**

- Craniocervical flexion test
- Construct validity established using nasopharyngeal EMG
- Fall, 2003
- Significant dysfunction in idiopathic neck pain and whiplash
  - Jull, 2000; 1999
- Significant dysfunction in CGH compared to control, migraine, and TTH
  - Zito, 2006; Jull, 1999; Jull, 2007

**COMMON FAULTS IN CRANIOCERVICAL FLEXION TEST**

- Patient performs a neck retraction rather than rotation action
- The pressure change is achieved using excessive superficial muscle activity
- The patient rests in a position of flexion
- There is evident jaw clenching and use of jaw muscles
- The patient is holding their breath
- The patient performs the action quickly and overshoots the target pressure

**NECK FLEXOR ENDURANCE TEST**

- Patient is positioned in supine, hook lying
- Patient is instructed to maximally retract chin
- Patient is instructed to lift the head 2.5 cm above the plinth and maintain position

- In patients with neck pain
  - Reliability ICC=0.67,
  - SEM= 11.5

(Harris, 2005)
ASSESSMENT

- Lower trapezius
- Serratus anterior

MUSCLE LENGTH

- Tightness
  - Upper trapezius
  - SCM
  - Sclenes
  - Levator scapulae
  - Pec maj & minor
  - Short sub-occipital extensors
    - Zito, 2006
- Trigger Points
  - Roth, 2007

ASSESSMENT

- Reliability of cervical muscle length
  - K = 0.4-1.0
    - Cleland, 2006; Zito, 2006
Clinical tests of musculoskeletal dysfunction in the diagnosis of cervicogenic headache

G. Zirak*, G. Jahl, F. Storey


Presence of physical examination findings

- 77 subjects
  - Cervicogenic (n=27)
  - Migraine with aura (n=25)
  - Control (n=25)

Examinations

- Posture
- Pressure pain threshold
- Cervical range of motion
- Joint repositioning error
- Manual assessment
- Muscle length
- Adverse Neural Tension
- Cervical flexor performance

Results

- Decreased flexion/extension in CHA group
- High prevalence of joint hypomobility and pain in CHA group
- Decreased muscle length

Absence of upper cervical joint hypomobility and lack of pec minor shortness was sensitive (sensitivity=0.80) in ruling out CHA.

Treatment
Non-invasive physical treatments for chronic/recurrent headache (Review)

Bennett G, Nilsen N, Han M, Ioannou R, Goldsmith CH, Ayonote WJ, Beero LM

For the prophylactic treatment of chronic headache, there is evidence that both aerobic exercise (eventually endurance training) and spinal manipulation are effective in the short and long term when compared to no treatment. There is also evidence that spinal manipulation is effective in the short term when compared to manage or placebo spinal manipulations, and weaker evidence when compared to spinal mobilizations.

Methodological Quality of Randomized Controlled Trials of Spinal Manipulation and Mobilization in Tension-Type Headache, Migraine, and Cervicogenic Headache

Results: Only 1 study met all the inclusion criteria. One clinical trial evaluated spinal manipulation and mobilization together, and the remaining 4 assessed spinal manipulation therapy, but did not specify which techniques were used. Methodological scores ranged from 41 to 60 out of a potential maximum of 100 points, indicating an overall poor quality of the studies. Only 2 studies obtained a high-quality score (greater than 50 points). No significant differences in quality scores were found based on the type of headache investigated. Methodological quality was not associated with the use of a parallel or crossover design, or the number of patients included in the studies. The most common flaws were a small sample size, the dosage of a placebo control group, lack of blinded patients, and no description of the manipulative procedure.

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

Randomized controlled trial of patients
- Exercise Only
- Manual Therapy Only
- Exercise and Manual Therapy
- Control (No treatment)
A Randomized Controlled Trial of Exercise and Manipulative Therapy for Cervicogenic Headache

Results
- All groups performed better than control and maintained at 12 month follow-up
- Combined group did not do significantly better than either treatment in isolation
  - However, 10% more patients experienced relief in the combination group than the other treatment groups

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

Randomized controlled trial of 32 subjects with cervicogenic headaches
- C1-C2 self-SNAG
- Placebo group

Assessed
- Immediately post intervention
- 4 weeks
- 12 months
Efficacy of a C1-C2 Self-sustained Natural Apophysial Glide (SNAG) in the Management of Cervicogenic Headache

Results

- Cervical Rotation
  - Immediately after initial treatment:
    - SNAG: 15° increase
    - Control: 5° increase

- Headache Index
  - 4 weeks
    - SNAG= 22 point decrease
    - Control= 0 point decrease
  - Change at 12 months from baseline
    - SNAG= 28 point decrease
    - Control= 6 point decrease

CERVICAL ROTATION SNAG

- Strap positioned on the posterior arch of C1
- Patient applies forward pressure on the strap and turns head toward restricted rotation, sustaining end range for 3 seconds

HEADACHE SNAG

- Stand beside seated patient
- Head is cradled between your body and right forearm if standing on right
- The right index, middle, and ring fingers wrap around the base of the occiput and the middle phalanx of the little finger lies of the spinous process of C2
- The lateral border of the left thenar eminence lies over the right little finger
- A gentle pressure is provided in a ventral direction on the spinous process of C2 while the skull remains stable
- The position is maintained at least ten seconds
**SELF HEADACHE SNAG**

- The patient places a hand towel around the C2 spinous process
- The patient glides their head back without tilting
- Patient sustains the posterior glide for at least ten seconds

![Towel](A) ![Hand](B)

**REVERSE HEADACHE SNAG**

- The patient is seated with 2nd-3rd digits supporting base of occiput without contact of cervical spine
- The thumb and index finger of the left hand wrap around C2
- The right hand provides a PA force on the occiput and held for at least ten seconds

**AA MUSCLE ENERGY TECHNIQUE**

- Grasp the patient head and fully flex the neck
- Use your index finger to palpate the posterior arch of C1 and rotate the neck to the right
- Instruct the patient to look or turn head to the left and gently perform a 3-5 second isometric contraction
- Do not allow the neck to extend during rotation
AA SELF MOBILIZATION

- Flex your neck and keep chin tucked
- Use hands to rotate the neck and perform gentle mobilization

OA MUSCLE ENERGY TECHNIQUE

- Cup the patient's chin with your right hand while supporting the side of the head with your right forearm
- With your left hand support the occiput just below the inferior nuchal line
- Introduce OA flexion
- Induce translation of the head left to right
- Instruct the patient to look up or extend the upper cervical spine and gently perform a 3-5 second isometric contraction

OA SELF MOBILIZATION

- Use your fingers to guide the upper cervical spine into flexion while retracting the chin repeatedly
- Avoid excessive motion from C2-7
- Isolate one side of OA joint by rotating the head approximately 30 degrees ipsilaterally and maintaining position during mobilization
TREATMENT

Deep Neck Flexor Retraining

Aims
- Normalize movement dysfunction
- Correct faulty static postural control
- Correct faulty dynamic postural control
- Muscle function
  - Normalize muscle length
  - Improve control
  - Strengthen global muscles

TREATMENT

Treatment Principles
- Never reinforce faulty movement strategy or pattern
- Must be precise controlled action
- Do not utilize heavy resistance (high load)
- Emphasis on holding time and endurance
- Progress to function
- NO PAIN

DEEP NECK FLEXOR TRAINING

Establish correct movement pattern
- Ask the patient to nod his head gently while retracting their neck
- Palpate the neck to ensure there is little to no activity of the SCM or scalene
- Patient asked to hold position just short of fatigue
- Practiced twice daily
  - Built up to 10 seconds and ten repetitions
  - Progressed from supine lying to upright postures
DEEP NECK FLEXOR TRAINING

- Cervical flexion with upper extremity motion
- Arm raises
  - Flexion
  - Abduction
- Resistance
  - Gravity
  - Manual
  - Thera-band

Sitting
- Controlled eccentric action of cervical flexors in cervical extension
- Followed by concentric action to return the head to neutral
- Avoid
  - Initiation of neck retraction
  - Return from flexion using SCM
- Progression
  - Gradual increases in range
  - Isometric holds through range

TRAINING EXTENSORS OF CRANIOCERVICAL SPINE

- Performed in sitting
  - Progressed to quadruped or prone on elbows
- Patient is instructed to flex the head slowly, controlling against gravity
  - Return to neutral position without excessive chin protrusion
- Patient asked to focus on straight ahead object to avoid excessive extension
CO-CONTRACTION OF THE NECK FLEXORS AND EXTENSORS

- Self-resisted isometrics rotation in
  - Supine
  - Upright postures
- Resistance in gentle (10-30% of MVC)
- Alternate rhythmic stabilization

TREATMENT

- Sitting and Supine
- Static alignment
  - Achieve neutral cervical spine and scapula position
  - Progress to dynamic control
  - Specific strengthening and stretching of global muscles
- Progress to
  - Prone
  - Quadruped
  - Standing

CASE STUDIES

Role of Manual Physical Therapy and Specific Exercise Intervention in the Treatment of a Patient with Cervicogenic Headaches: A Case Report

A Specific Exercise Program and Modification of Postural Alignment for the Treatment of Cervicogenic Headache: A Case Report