Back To Chiropractic CE Seminars

Head & Neck Conditions ~ 6 Hours

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Marcus Strutz, DC
Back To Chiropractic CE Seminars

At a Glance: Head & Neck Conditions

Presented by Jamie He, D.C.

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Learning Objectives
6 Hours on Common Head & Neck Conditions

- Section 1: Review anatomy and physiology of the head and neck regions; review orthopedic tests and examination of the regions. Discuss headache disorders: discuss common causes, differentiate referral from nonreferral cases, discuss red flags, overview of common types of headaches.
- Section 2: Recognize and differentiate common conditions with soft tissue vs skeletal involvements in the cervical spine. Identity serious conditions include stroke, tumor, etc.
- Section 3: More on the suggested therapies, maneuvers, exercises and nutrition

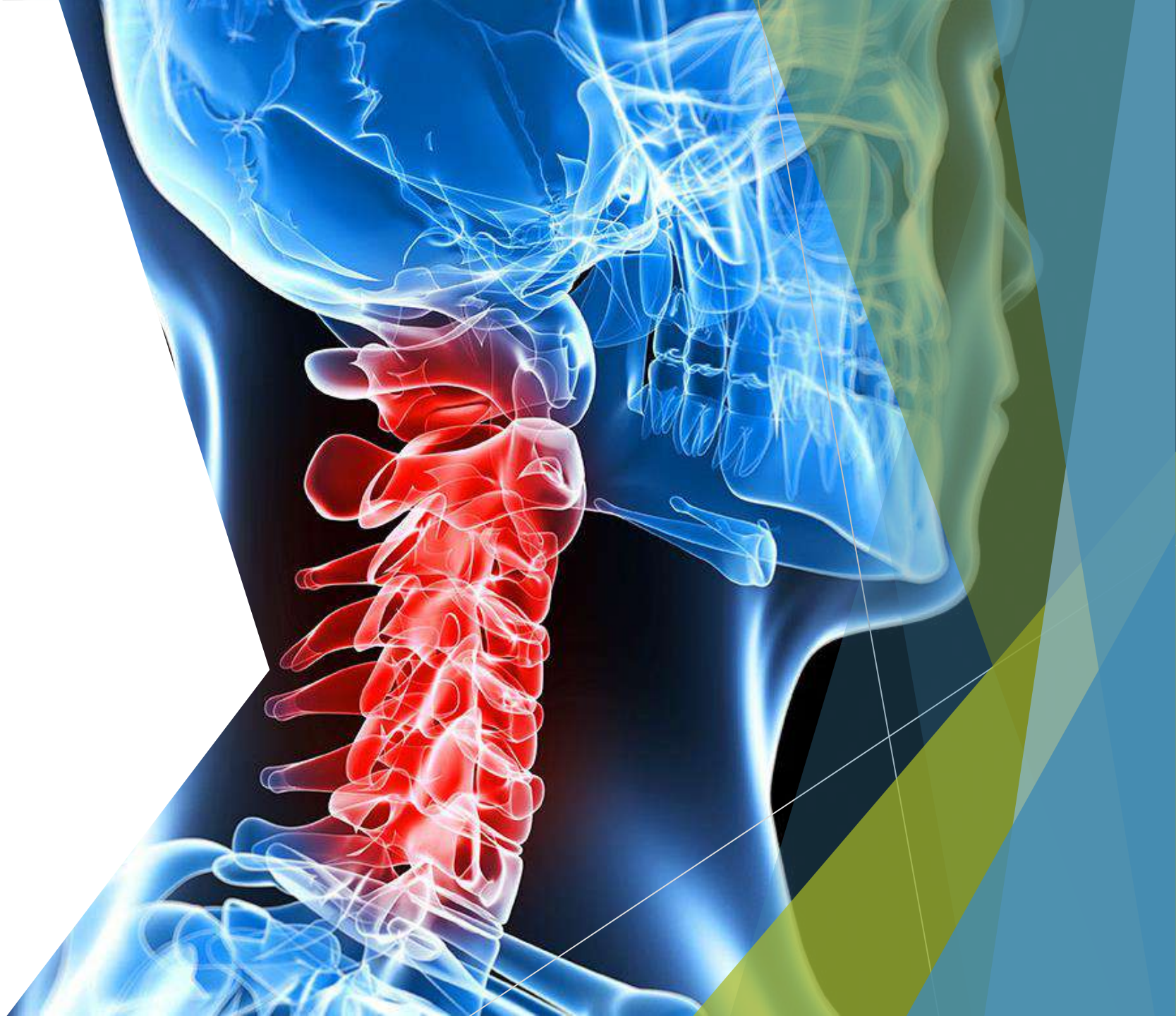
Overview

1. Provide an easy-to-read “manual” for common head and neck conditions
2. Recognize the red flags of the conditions for proper referral
3. Differentiate common head and neck conditions seen in a chiropractic office
4. Review anatomy and physiology of the cervical spine
5. Provide lists of key questions in history taking, demographics, and classic presentation of each condition
6. Review lists of positive physical exam findings and suggested management on each condition

Always remind ourselves that…

- Common people have common things BUT it is very important for us to recognize what is UNCOMMON. The goal of this course is to refresh our knowledge on the common conditions and the red flags of the rare ones.
- While patient history is important, the most reliable information that leads to our final clinical decision or diagnosis is signs and symptoms and findings from the examinations.

Anatomy Review



Sternocleidomastoid

Attachement:

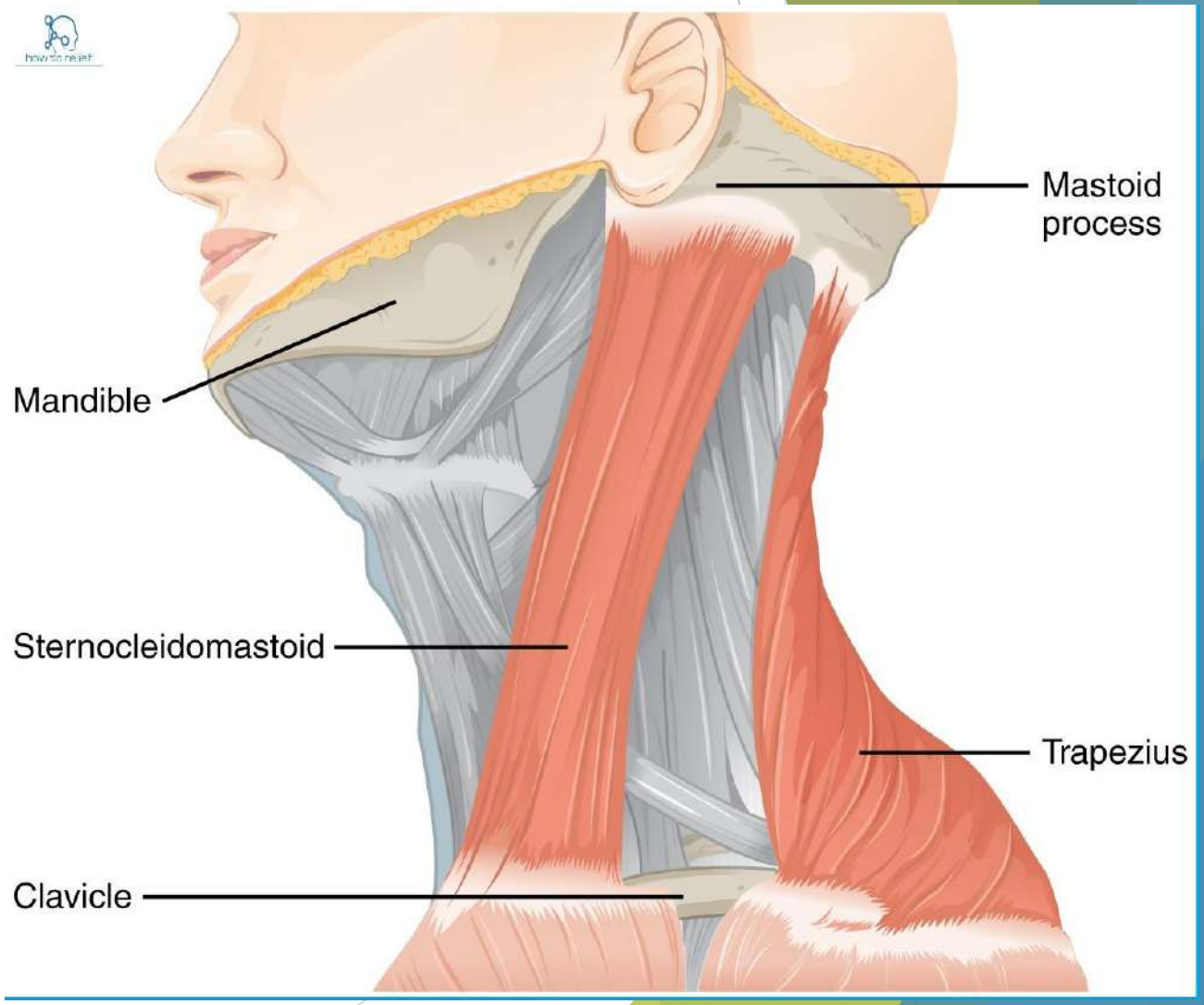
- Top of sternum, medial clavicle, and mastoid process

Action:

- Ipsilateral flexion and contralateral rotation

Clinical relation:

- Wryneck, torticollis



Longus Colli

Attachment:

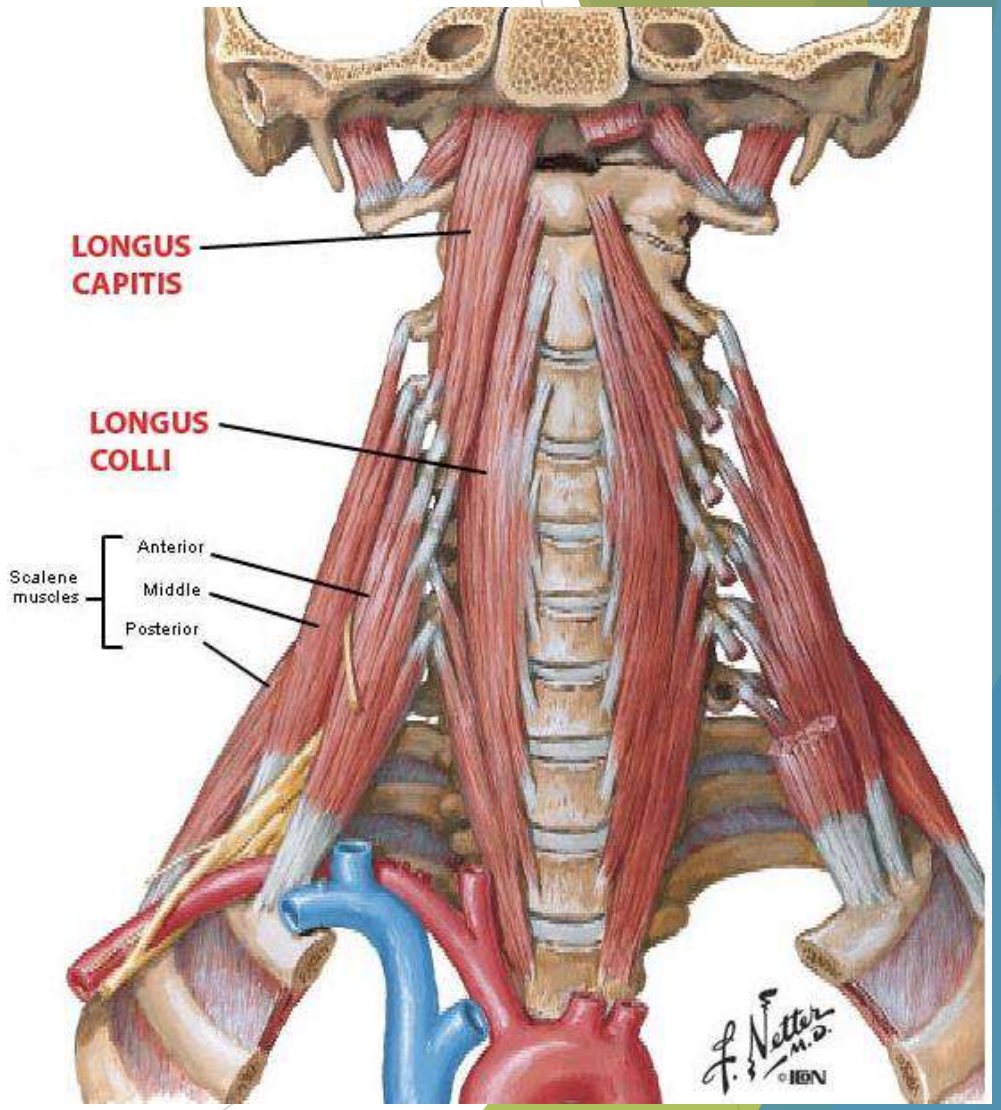
- C1-C2 anterior and C3-T3 anterior

Action:

- Flexion

Clinical relation:

- Calcific tendonitis
- Whiplash



Scalene muscles

Attachment:

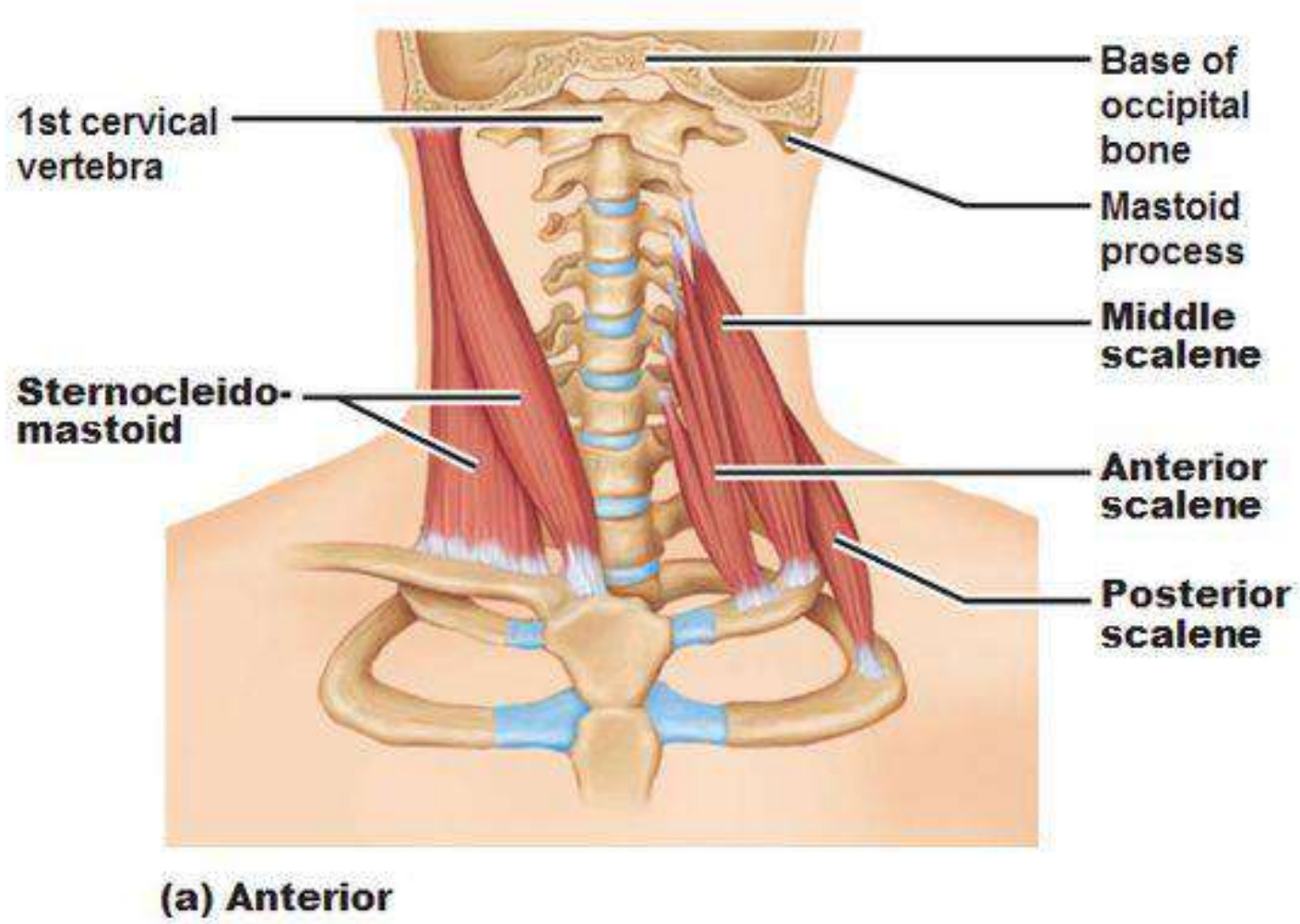
- Anterior: C3-C6 and anterior rib 1
- Middle: C2-C7 and anterior rib 1
- Posterior: C4-C6 and anterior rib 2

ACTION:

- Flexion and lateral flexion
- Elevates rib 1 and 2

Clinical relation:

- Paresthesia
- Whiplash



Trapezius, upper

Attachment:

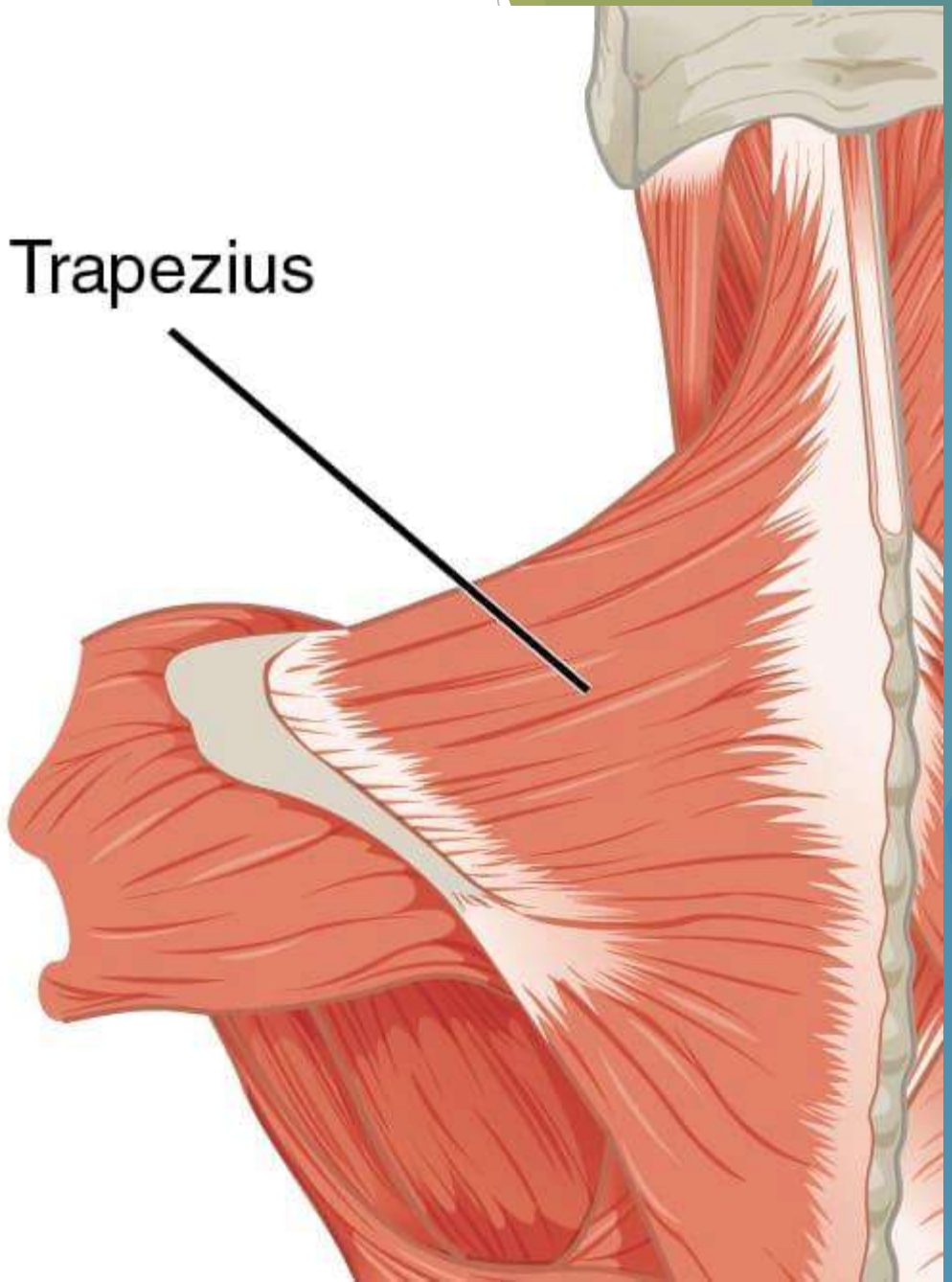
- Occiput, C1-C7, lateral clavicle, acromion

Action:

- Lateral flexion, contralateral rotation, extension
- Elevation and upward rotation of scapula

Clinical relation:

- Shoulder pain
- Scapula instability
- Assess damage of accessory nerve



Splenius capitis

Attachment:

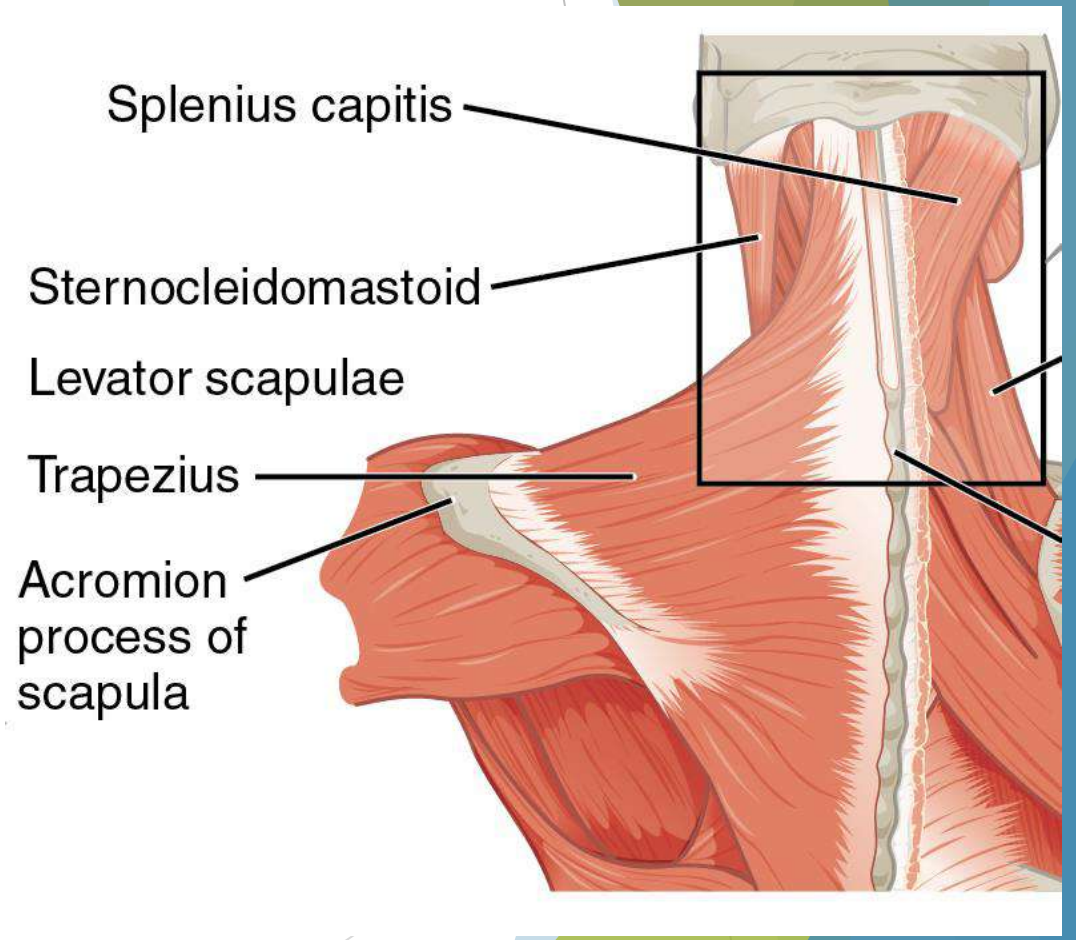
- Nuchal ligament, C7-T3 spinous process, posterior mastoid process of temporal bone

Action:

- Lateral flexion, ipsilateral rotation, extension

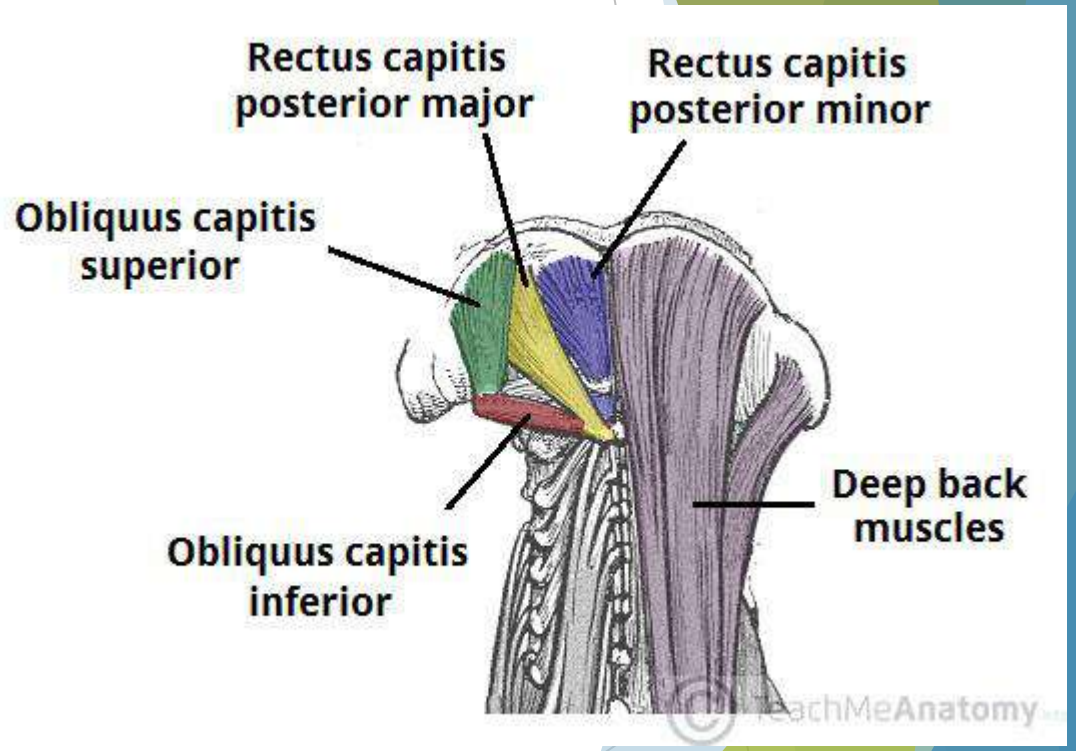
Clinical relation:

- Splenius capital muscle syndrome – mimics pain pattern of migraine and temporal tendinitis



Suboccipital muscles

- Rectus capitis posterior major
- Rectus capitis posterior minor
- Obliquus capitis superior
- Obliquus capitis inferior



Attachment:

- Occipital bone, C1, C2

Action:

- Lateral flexion, ipsilateral rotation, extension

Clinical relation:

- Occipital syndrome
- Tension headache

Temporalis muscle

Attachment:

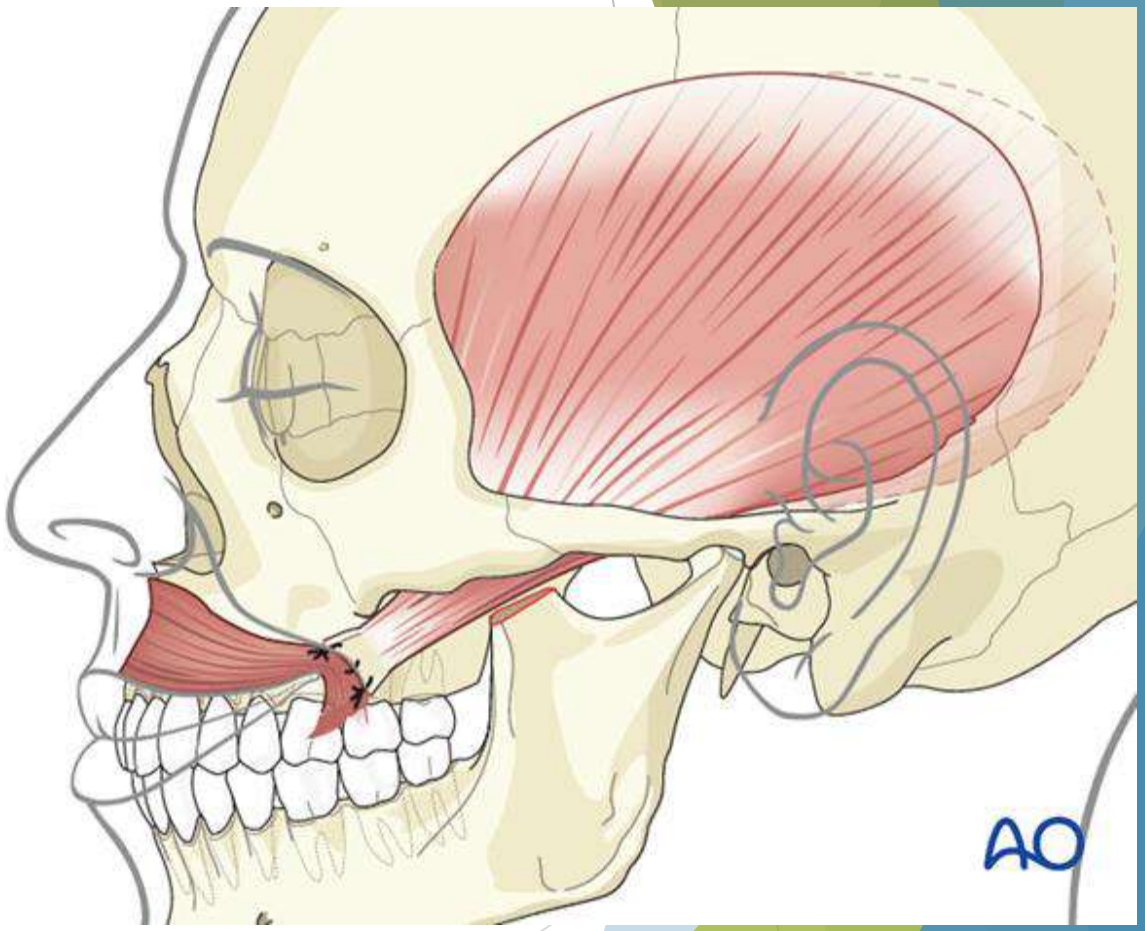
- Temporal bone, coronoid process of mandible

Action:

- Elevates and retracts mandible

Clinical relation:

- Muscle hypertonicity causing pain over the temporal region



Muscle Grouping by Actions

Action	Main Muscles
Flexion	SCM, longus colli, longus cervicis, longus capitis, rectus capitis anterior
Extension	Trapezius, splenius cervicis, splenius capitis, longissimus capitis, levator scapulae, suboccipitals
Lateral flexion	Scalenes, levator scapulae, longissmus capitis, splenius capitis, splenius capitis, rectus capitis lateralis
Rotation	SCM, longus capitis, rotators, splenius, suboccipitals
Mastication	Masseter, temporalis, medial and lateral pterygoid

Examination Review

Normal Active Range of Motion

Action	Range of motion
Flexion	60
Extension	60
Lateral flexion	45
Rotation	80
TMJ	35-50mm opening or ~3 finger tips inserted between upper & lower incisors

Myotome and Dermatome Testing

Nerve Root Level	Sensory Testing	Motor Testing	Reflex Testing
C1-C2	Front of face	Neck flexion	N/A
C3	Lateral face and skull	Lateral flexion	N/a
C4	Supraclavicular	Shoulder shrug	N/A
C5	Lateral shoulder/upper arm	Shoulder abduction	Bicipital (musculocutaneous)
C6	Lateral lower arm and hand (thumb and index finger)	Elbow flexion and wrist extension	Brachialradial (musculocutaneous)
C7	Palmar aspect of hand – middle 3 fingers	Elbow extension and wrist flexion	Triceps (radial)
C8	Medial lower arm and hand	Finger flexion and thumb extension	N/A
T1	Medial elbow and upper arm	Finger abduction	N/A

Orthopedic Tests, grouped by indications

Indication	Test Name	Positive Findings	Notes
CERVICAL RADICULOPATHY	Cervical compression: Lateral flexion (Jackson's compression), Maximal foraminal compression (Spurling's test)	Reproduce upper extremity pain, paresthesia or numbness	Increased local neck pain only, suggests cervical disc derangement, facet syndrome, or intersegmental dysfunction
	Cervical distraction	Decrease symptoms	If causes local pain, sprain/strain
	Upper limb tension test	Reproduce symptoms with elbow flexion	Ulnar nerve or C8 or T1 radiculopathy
	Shoulder abduction / Present Bakody's sign	Decrease radiating arm pain	
	Valsava maneuver	Increase radiating pain	
	Arm squeeze test	More pain in upper arm	C5-T1 nerve roots
	Brachial compression	Reproduce/increase radiating pain	

NOTE

Neurological exam procedures to screen for loss of nerve root function – due to compressive or tractional forces. Procedures should be compared bilaterally.

- Deep tendon reflexes (biceps, triceps, brachioradialis)
- Muscle tests in the upper extremity (performed repetitively or sustained if necessary)
- Dynamometer (optional)
- Sensory tests (light touch, sharp-dull discrimination, pin wheel)
- Measure girth of arm and forearm checking for atrophy.

Upper Limb Tension Test

aka Brachial Plexus Tension Test / Elvey Test

- Used to confirm or rule out the possibility of neurodynamic tension in cases of suspected ulnar, C8, T1 nerve adhesion or impingement

Procedure: A seated patient is instructed to abduct the arms with elbows extended until the onset of arm symptoms. The patient then repositions the arms just short of symptoms and laterally rotates the arms while being supported in this position by the examiner. Next, with examiner support under the elbows, the patient flexes the elbows such that the hands are positioned behind the head.

Interpretation: Reproduction of arm symptoms with elbow flexion is considered a positive test suggesting an ulnar nerve lesion or C8 or T1 radiculopathy

Arm Squeeze Test

- Differentiate whether pain in the shoulder region is due to a nerve root lesion or a lesion of the shoulder girdle

Procedure: With the patient seated and the examiner standing behind the patient, the examiner places their hand on the middle third of the patient's arm (fingers over biceps and thumb over triceps) and applies a firm squeeze with approximately 6 to 8 kg of force. For comparison, digital pressure of the same amount of force is also carried out on the acromioclavicular and anterolateral-subacromial area. The patient is asked to rate their pain with each of the squeezes.

Interpretation: Squeezing the middle third of the upper arm is more likely to elicit a reaction of local pain in patients with cervical nerve root irritation from C5 to T1, not when the pain arises from the shoulder. If this squeeze is more painful than the comparative squeezes, it is more likely that the patient's shoulder pain is due to a nerve root lesion. The test is considered positive when the patient rates the pain at least 3 points higher with the arm squeeze than with the squeezes at the acromioclavicular and anterolateral-subacromial areas.

What do the studies say…

A recent systematic review suggested that a combination of a positive Spurling's test, cervical distraction test, and Arm Squeeze test may be used to increase the likelihood of a cervical radiculopathy, whereas a negative outcome of combined Upper Limb Neural Tension tests (ULNTs) and Arm Squeeze test may be used to decrease the likelihood.

Value of physical tests in diagnosing cervical radiculopathy: A systematic review

Erik Thoomes, Sarita van Geest, Danielle A van der Windt, Deborah Falla
The Spine Journal. 2018

Abstract

In clinical practice, the diagnosis of cervical radiculopathy is based on information from the patient's history, physical examination, and diagnostic imaging. Various physical tests may be performed, but their diagnostic accuracy is unknown. Purpose: This study aimed to summarize and update the evidence on diagnostic performance of tests carried out during a physical examination for the diagnosis of cervical radiculopathy. Study design: A review of the accuracy of diagnostic tests was carried out. Study sample: The study sample comprised diagnostic studies comparing results of tests performed during a physical examination in diagnosing cervical radiculopathy with a reference standard of imaging or surgical findings. Outcome measures: Sensitivity, specificity, likelihood ratios are presented, together with pooled results for sensitivity and specificity. Methods: A literature search up to March 2016 was performed in CENTRAL, PubMed (MEDLINE), Embase, CINAHL, Web of Science, and Google Scholar. The methodological quality of studies was assessed using the QUADAS-2. Results: Five diagnostic accuracy studies were identified. Only Spurling's test was evaluated in more than one study, showing high specificity ranging from 0.89 to 1.00 (95% confidence interval [CI]: 0.59-1.00); sensitivity varied from 0.38 to 0.97 (95% CI: 0.21-0.99). No studies were found that assessed the diagnostic accuracy of widely used neurological tests such as key muscle strength, tendon reflexes, and sensory impairments. Conclusions: There is limited evidence for accuracy of physical examination tests for the diagnosis of cervical radiculopathy. When consistent with patient history, clinicians may use a combination of Spurling's, axial traction, and an Arm Squeeze test to increase the likelihood of a cervical radiculopathy, whereas a combined results of four negative neurodynamics tests and an Arm Squeeze test could be used to rule out the disorder.

Indication	Test Name	Positive Findings	Notes
INSTABILITY	Alar ligament stress test	Excessive movement of C2 spinous process	Upper cervical ligament injury
	Transverse ligament stress test	Odd feeling in the back of the throat	Atlantoaxial joint instability
	Sharp-Purser test	Posterior slide of the head	Atlantoaxial joint instability
	Rust's sign	Patient supports the neck with their hands	Upper cervical fracture, rheumatoid arthritis, severe sprain or subluxation

Alar Ligament Stress Test

- Assess the integrity of the alar ligaments and thus upper cervical stability

Procedure: Patient is in supine position. Place one hand on the occiput and use the other hand to palpate the spinous process of C2. Laterally flex or rotate the head to one side; you should feel the spinous process move to the opposite side. Repeat on the other side.

Interpretation: Absence of the spinous process moving to the opposite side may indicate alar ligament injury. If you block the spinous process of C2 from moving, you may stress the ligament. You should encounter a firm end-feel in this case. Significant movement may indicate ligamentous injury.

Transverse Ligament Stress Test

- Assess hypermobility of the atlantoaxial articulation.

Procedure: Patient is in supine position. Place one hand on the occiput with the index finger on the space between C2 spinous process and occipital protuberance (where the posterior arch of C1 lies). Place the other hand on the forehead. Lift the head straight up in a vertical plane (NOT flexion, more of a protraction motion). Hold for 10-20 seconds.

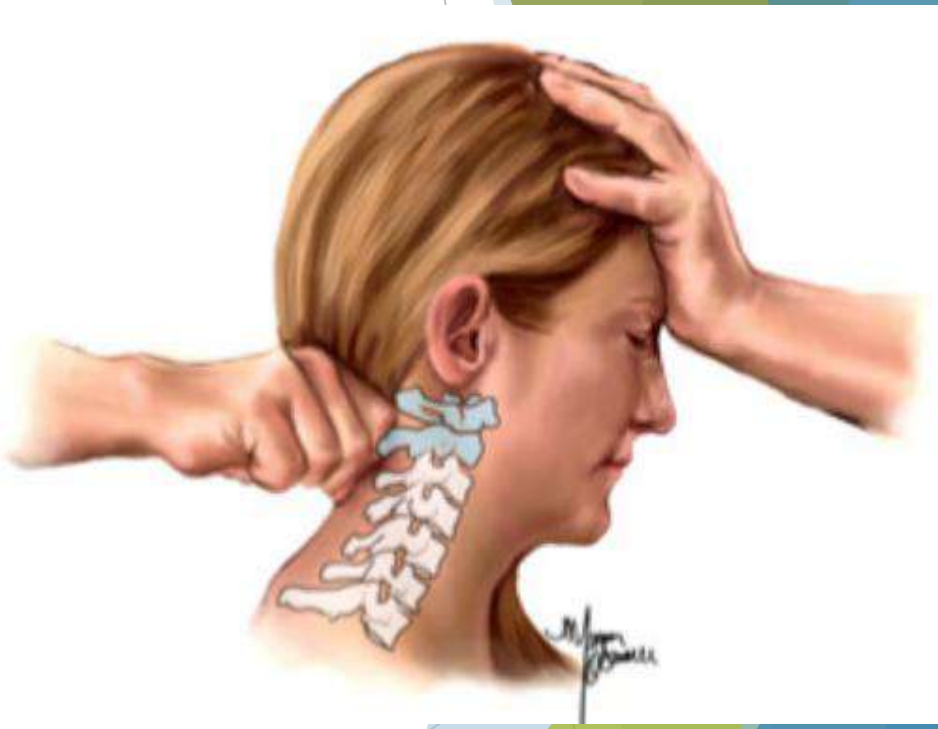
Interpretation: The test is positive when a soft end-feel is present, or if the patient experiences some feelings of weakness, dizziness, numbness, nystagmus/eye twitching, abnormal pupil response, muscle spasm, or an odd feeling in the back of the throat.

Sharp-Purser Test

- Assess the integrity of the atlantoaxial joint

Procedure: Patient is in sitting position. The patient should perform a slight cervical nod. The examiner then places one hand on the forehead, while the other hand is placed on the spinous process of C2 (both arms should be parallel to the ground!). A posteriorly directed force is applied by the hand on the forehead, while the hand on the spinous process of C2 just stabilizes. There should be a firm end-feel.

Interpretation: The test is positive if there is a sliding movement of the head or a decrease in symptoms (often neuro symptoms; "clunk" may occur).



this test should be performed with extreme caution!!

Indication	Test Name	Positive Findings	Notes
Sprain/Strain	Cervical distraction		If increase pain, sprain/strain
	Cervical AROM/PROM	Increased pain and reduce ROM	
	Muscles tests	Pain and reduced strength	
	O'Donoghue maneuver	Pain during passive – sprain; pain during active - strain	Distinguish sprain and strain
	Scalene cramp test	Neck pain and refers to lateral aspect of the hand	Active scalene trigger point

O’Donoghue maneuver

- Distinguish between cervical muscle strain and ligament sprain.

Procedure: The examiner will put the painful area through a passive range of motion into each of the cardinal directions, then the patient will actively go through the same range of motion by themselves.

Interpretation: If the area hurts during passive, but not active ROM, it points to a sprain. If the area hurts during active, but not passive ROM, it points to a strain.

The passive tests place end range tensile loads on the cervical ligaments and discs. Such tests also load the muscle at end range, without eliciting an active contraction of that muscle.

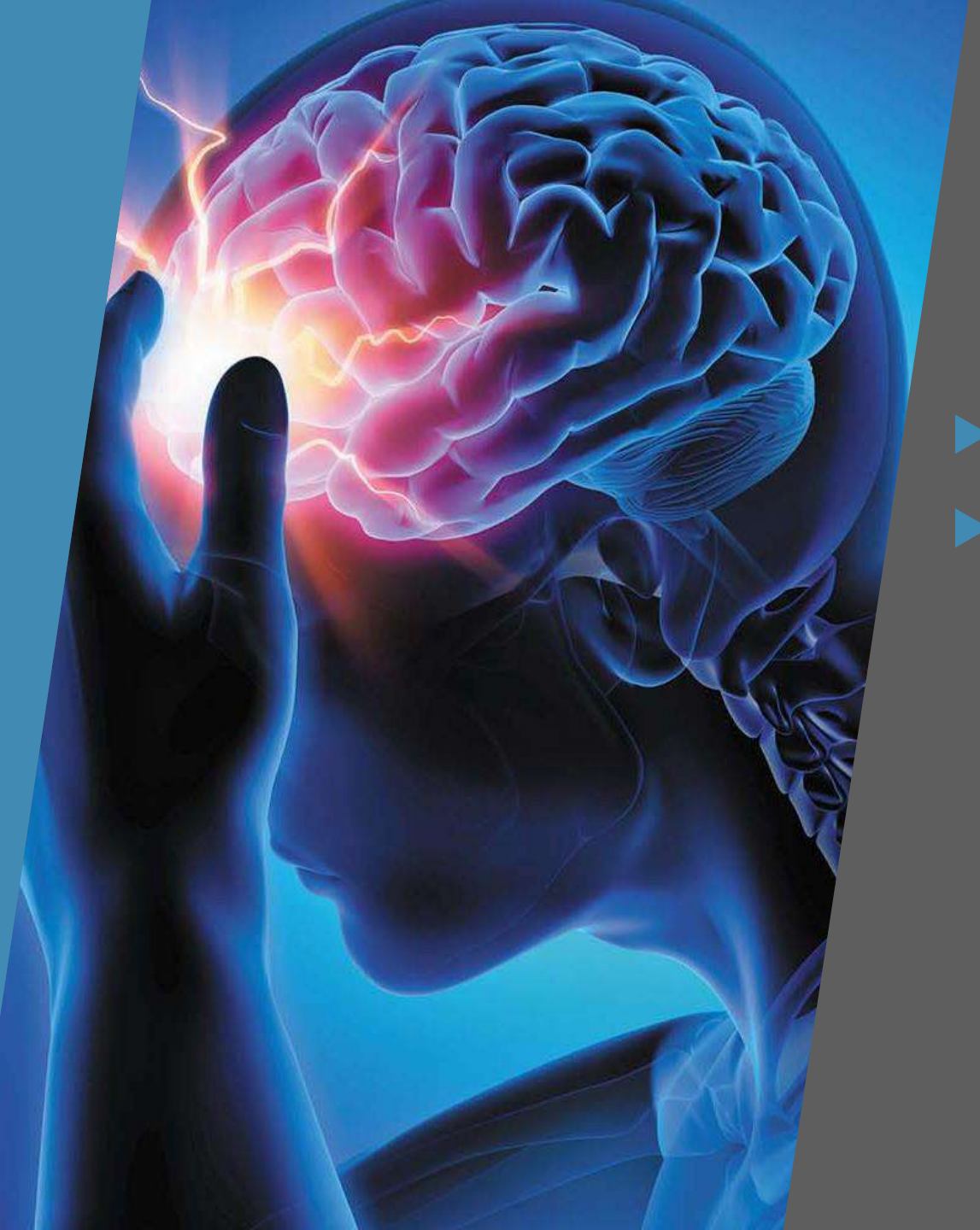
Scalene Cramp Test

- Assess active involvement of scalene trigger points

Procedure: Patient in seated position. Rotate head to the affected side and place the chin over the supraclavicular groove for 60 seconds.

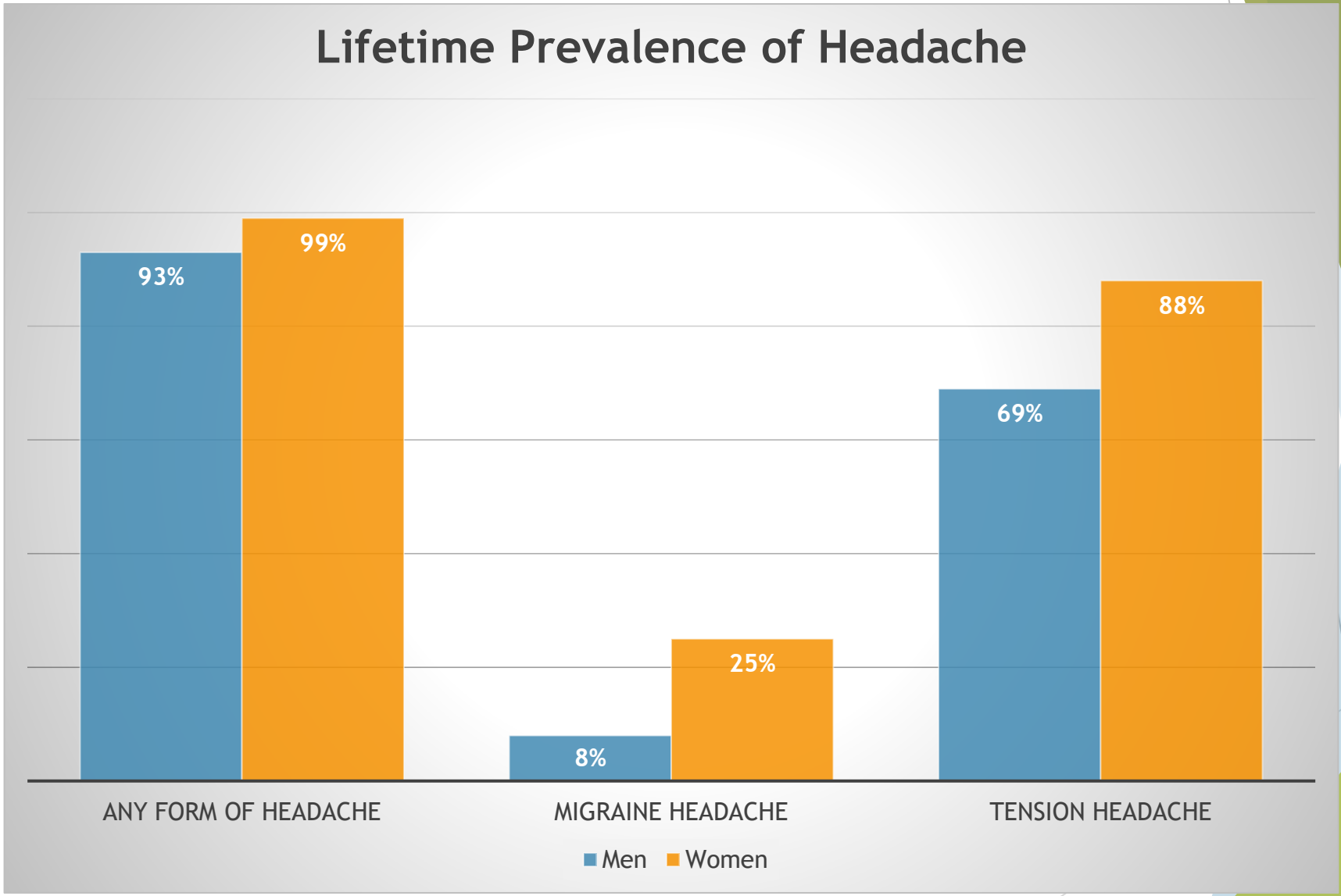
Interpretation: The test is positive when there is neck pain and radiculopathy or a tingling sensation on the lateral aspect of the hand, as the anterior scalene muscle is being compressed and irritates the brachial plexus.

The pain can be inhibited by the **Scalene Relief Test** - patient brings his or her forearm up to the forehead and to rotate the shoulder forward on the symptomatic side.



Headaches

- Extremely common
- According to the WHO, headaches are among the most common disorders of the nervous system



Data gathered from *Epidemiology of headache in a general population--a prevalence study*

Prevalence of neck pain in migraine and tension-type headache: A population study

Sait Ashina, Lars Bendtsen, Ann C Lyngberg, Richard B Lipton, Nazrin Hajiyeva, Rigmor Jensen
Cephalagia. Vol 35 Issue 3, May 2014.

Background: We assessed the prevalence of neck pain in the population in relation to headache.

Methods: In a cross-sectional study, a total of 797 individuals completed a headache interview and provided self-reported data on neck pain. We identified migraine, TTH or both migraine and TTH (M+TTH) groups. Pericranial tenderness was recorded in 496 individuals. A total tenderness score (TTS) was calculated as the sum of local scores with a maximum score of 48.

Results: The one-year prevalence of neck pain was 68.4% and higher in those with vs. without primary headache (85.7% vs. 56.7%; adjusted OR 3.0, 95% CI 2.0–4.4, $p < 0.001$). Adjusting for age, gender, education and poor self-rated health, in comparison with those without headaches, the prevalence of neck pain (56.7%) was significantly higher in those with M+TTH (89.3%), pure TTH (88.4%) and pure migraine (76.2%) ($p < 0.05$ for all three group comparisons). Individuals with neck pain had higher TTS than individuals without neck pain (15.1 ± 10.5 vs. 8.4 ± 8.0, $p < 0.001$).

Conclusions: Neck pain is highly prevalent in the general population and even more prevalent in individuals with primary headaches. Prevalence is highest in coexistent M+TTH, followed by pure TTH and migraine. Myofascial tenderness is significantly increased in individuals with neck pain.

Types of Headaches

Primary vs Secondary

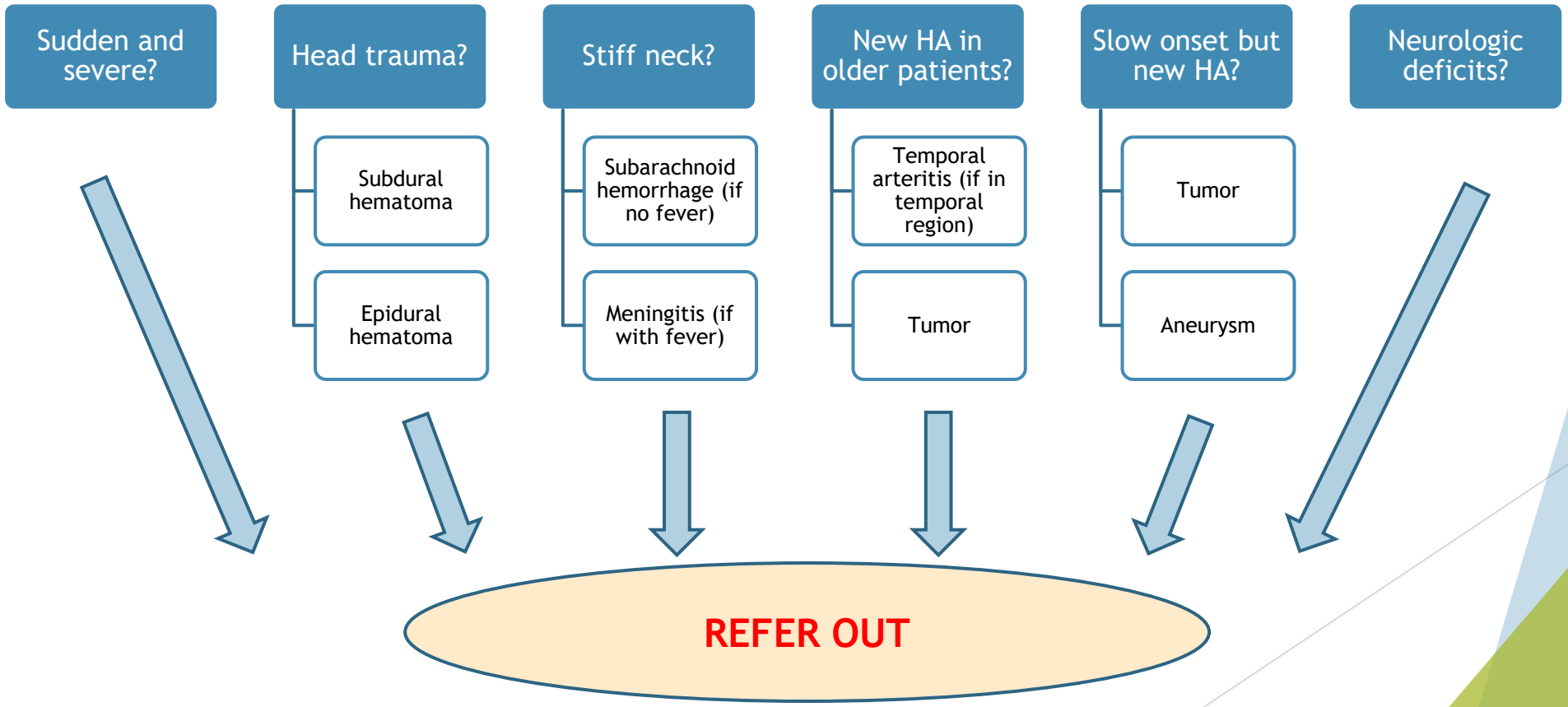
- Primary – the headache IS the condition
  - Episodic – can last from half an hour to several hours, occurs occasionally
  - Chronic – can last for days at a time, occurs most days of the month
- Secondary – the headache is the SYMPTOM of another condition

Common Headache Disorders

- Headaches caused by a neck problem
  - Cervicogenic headache
- Headaches that may cause neck pain
  - Tension headache (most common)
  - Migraine headache
  - Cluster headache
  - Temporomandibular joint (TMJ) headache
  - Post-traumatic headache
- Sinus headache

A patient complaints of a headache (HA)…

Before we categorize it to one of the common types, ask the following to determine the need of referral

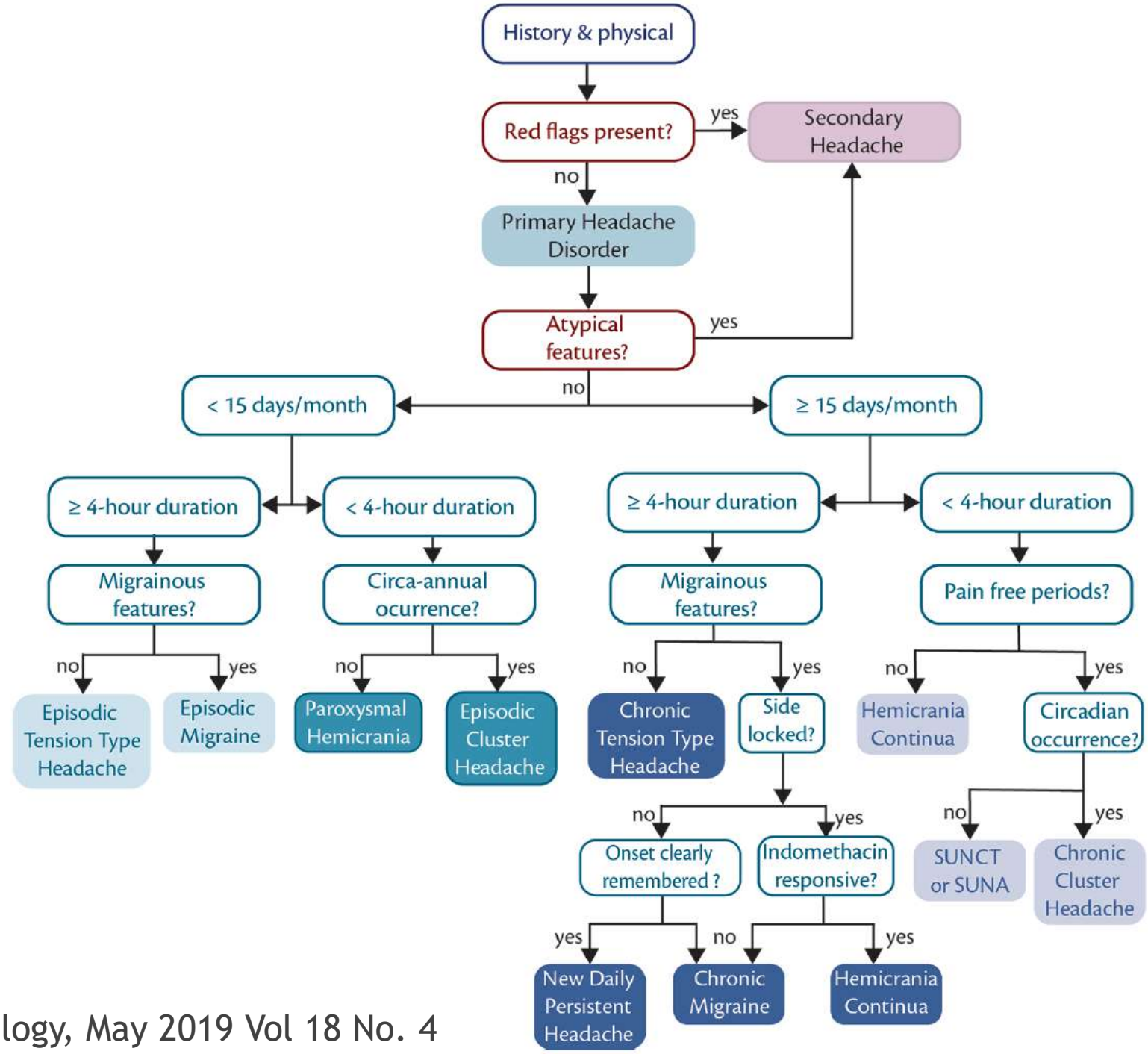


S	Systemic signs and symptoms
N	Neurologic symptoms
O	Onset is sudden
O	Older patients
P	Progressive
P	Positional change, Precipitators, Papilledema

Remember the “SNOOPP”

SNOOPP

- **S**ystemic signs and symptoms
  - weight loss, fever, chills, myalgia, and anorexia
  - Patients with HIV, cancer, vasculitides, infections, and cerebrovascular disorders
- **N**eurologic symptoms
  - Reflex abnormalities, muscle weakness, alterations of consciousness, confusion, cranial nerve deficits
- **O**nset
  - A sudden onset headache - most serious cause is a hemorrhage
- **O**lder
  - Age >50 with a new headache
- **P**rogressive
  - Getting worse
- **P**ositional change – may indicate cerebrospinal fluid leak -> intracranial hypotension
  Precipitators – Valsava maneuver or activities like bending, lifting, jumping, or coughing may indicate increased inctracranial pressure
  Papilledema – swollen optic nerve – a significant finding in increased intracranial pressure



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Cervicogenic Headache

- Primary HA
- Demographics
  - Females>Males
- Classic Presentation
  - Reduced neck motion (especially at upper cervical/occipital region)
  - Ipsilateral headache localized to the neck and occiput
  - May have ipsilateral neck, shoulder, or arm pain – no specific pattern

- Physical exam findings
  - Limited or reduced AROM and/or PROM
  - Increased pain with pressure over upper cervical spine
  - Neck muscles tenderness
- Suggested Management
  - Cervical manipulation (most effective)
  - Myofascial release
  - Therapies that decrease muscle spasm (TENS, heat packs, tractions, stretching)
  - Posture and ergonomic evaluation

Tension Headache

- Primary HA
- Demographics
  - Females>Males
- Two Types
  - Episodic - <15X/month, duration of 30mins to 7 days
  - Chronic - >15X/month for 6 months
- Classic Presentation
  - Bilateral and described as pressing or tightening , NOT pulsatile
  - NO nausea/vomiting, photophobia/phonophobia
  - NOT aggravated by climbing stairs or similar routine physical activity

- Physical exam findings
  - NO specific diagnostic findings
  - May have limited or reduced Csp in AROM and/or PROM
  - Muscle tenderness and hypertonicity in the neck or upper cervical
- Suggested Management
  - Myofascial release / massage therapy (most effective)
  - Therapies that decrease muscle spasm (TENS, heat packs, tractions, stretching)
  - Cervical manipulation
  - Posture and ergonomic evaluation
  - NSAIDs for temporary relief

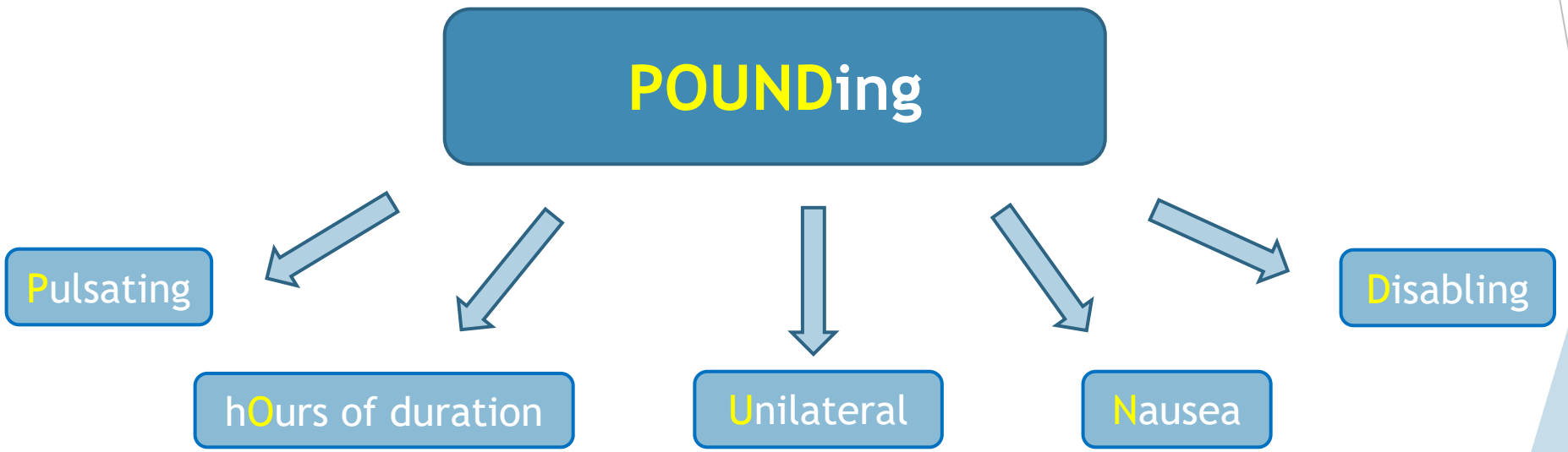
Migraine

- Primary HA
- Demographics
  - Females>Males
- Two Types
  - With Aura (classic migraine) – about 20%
    - symptoms of the nervous system (usually visual / olfactory) that precede a migraine; last for about 30 mins and followed by a disabling headache that lasts for hours to days
  - Without Aura (common migraine) – about 80%
    - Headaches are not disabling but still severe

- Classic Presentation
  - Unilateral throbbing or pulsatile
  - Nausea & vomiting, photophobia &/or phonophobia
  - Associate with triggering factors
    - Stress
    - Rapid hormonal changes – menstruation, puberty, menopause
    - Rapid blood sugar changes
    - Vasoactive foods – red wine, cheese, nuts, chocolate, coffee, tea, alcohol, MSG, preservatives

- Physical exam findings
  - NO specific diagnostic findings
  - May have reduced ROM and cervical joint dysfunction
  - Muscle hypertonicity in the neck and/or face
- Suggested Management
  - Cervical manipulation
  - Stress management – relaxation massage, control triggering factors, rest
  - Diet management
  - Co-management with acupuncture treatment and/or prescription medications

Mnemonic for migraine with aura



Cluster Headache

- Primary HA
- Demographics
  - Males>Females, often middle-aged
- Classic Presentation
  - Unilateral periorbital
  - “most painful feeling”
  - Short duration (average 30mins)
  - History of smoking or alcohol abuse
  - Nocturnal attacks
  - Gradually diminish over years

- Physical exam findings
  - NO specific diagnostic findings
  - Associated symptoms during the attack
    - Lacrimation, runny nose on the SAME side as the headache
    - Agitated and animated
- Suggested Management
  - Stress management and relaxation therapy
  - Cervical manipulation (NO clear literature indication of chiropractic success)
  - Medications

Temporomandibular Joint (TMJ) Headache

- Secondary HA
- Demographics
  - Females>Males, often between age 20-40
- Classic presentation
  - Dull ache starting at the temples and around the TJM, may resemble an earache
  - History of TMJ disorders/injury
  - Neck pain/stiffness due to fatigue/weakness of mastication muscles
  - Involuntary grinding and/or clenching of teeth

- Physical exam findings
  - May observe jaw asymmetry due to muscle hypertrophy
  - Tenderness to palpation over muscles of mastication
  - Muscle spasm or weakness in muscles of mastication (temporalis, masseter, pterygoids)
  - Clicking/popping in the jaw
  - Decreased/restricted ROM when opening jaw, protrusion and lateral deviation
- Suggested management
  - Cervical and TMJ manipulation
  - Ice and heat
  - Myofascial treatment – trigger point therapy, friction massage
  - Avoid hard or chewy food

Post-traumatic Headache

- Secondary HA
- Classic presentation
  - Onset within 7 days of the head injury or after regaining consciousness
  - Dizziness
  - Insomnia
  - Poor concentrating
  - Memory problems
  - Sensitive to light and sound
  - Mood and personality changes (depression and nervousness)
  - Some experience symptoms similar to migraine or tension-like headaches
  - Can last for months or years for ones with mild head trauma

- Physical exam findings
  - NO specific diagnostic findings
  - May present positive neurologic exam findings
    - Sensory (cranial nerve exam, light touch, shap/dull, vibration)
    - Deep tendon reflex
    - Muscle testing
  - Refer out for CT and MRI for more severe injuries
- Suggested Management
  - Multidisciplinary treatment (optimal approach)
  - Medications: anti-inflammatory, pain relief (most effective)
  - Biofeedback/relaxation therapy
  - Physical therapy
  - Cognitive behavioral therapy
  - Nerve simulators

Clinical Characteristic of the more common types of Chronic Post-traumatic HA

	Tension-type like	Migraine like	Cluster like	Cervicogenic like
Sidedness	Bilateral	Unilateral	Unilateral	Manly unilateral
Intensity	Mild-moderate	Moderate-severe	Severe-very severe	Mild-severe
Quality	Pressing, dull, squeezing	Pounding, throbbing, drilling, piercing	Boring, throbbing	Dull, aching
Location	Vary	Vary	Retro/peri-orbital but may spread	Starts in the neck and spreads to anterior regions
Aggravated by	Emotional stress, tension	Physical activity,	Alcohol (during the cluster)	Neck movement/posture
Other features	Can be episodic or continuous	Photophobia/phonophobiaNausea/vomitingWith/without aura	Cranial autonomic activation (e.g. lacrimation, rhinorrhoe)	Often a history of whiplash

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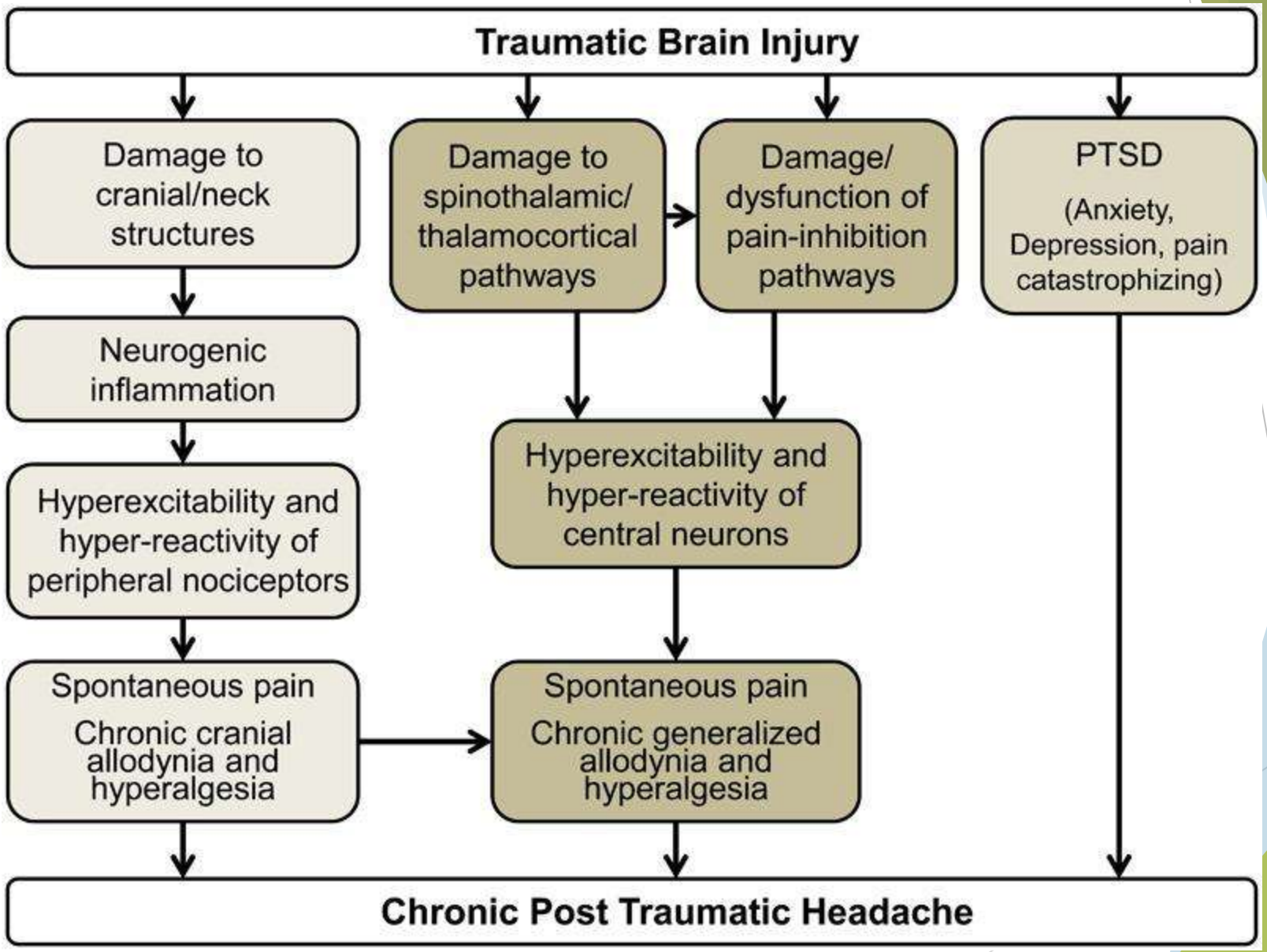

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Sinus Headache

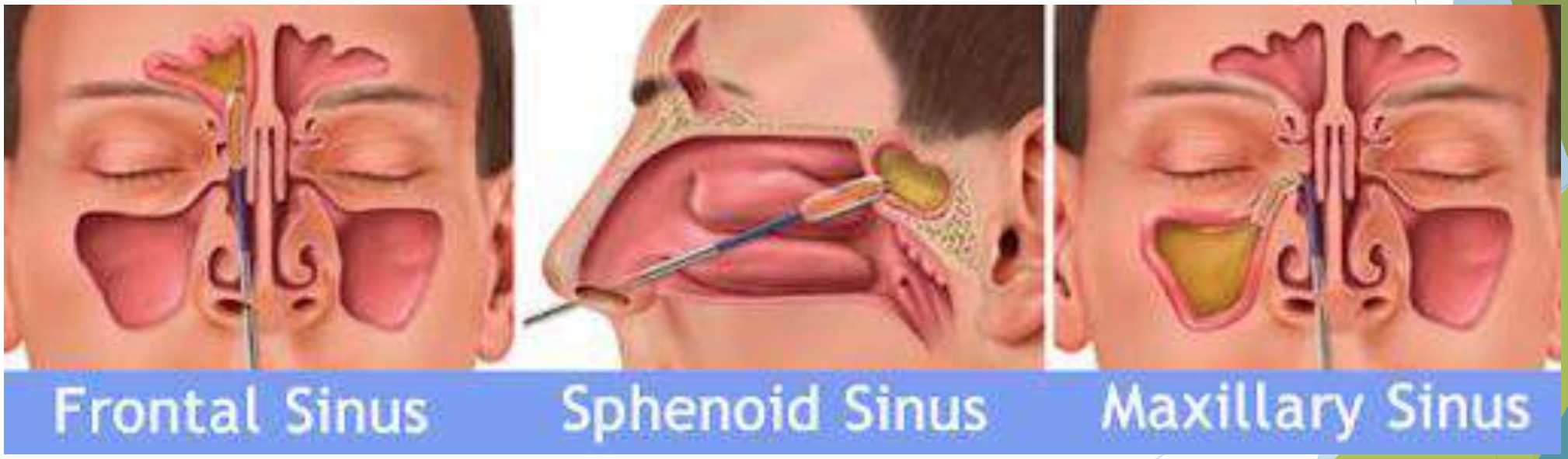
- Secondary HA
- Classic presentation
  - Pain, pressure, and fullness in cheeks, brow or forehead
  - Pain is worse when leaning forward or lying down
  - Stuffy nose or has nasal discharge
  - Sometimes feel fatigue or achy feeling in the upper jaw
  - Triggered by allergens

- Physical exam findings
  - Tenderness over the sinuses
  - Increased pain with neck flexion
- Suggested management
  - Cervical manipulation - **Nasal-specific technique**
  - Warm compresses
  - Medication – pain relief, antihistamines, decongestants for temporary relief
  - Avoid triggers
  - Regular aerobic exercise – reduce tension

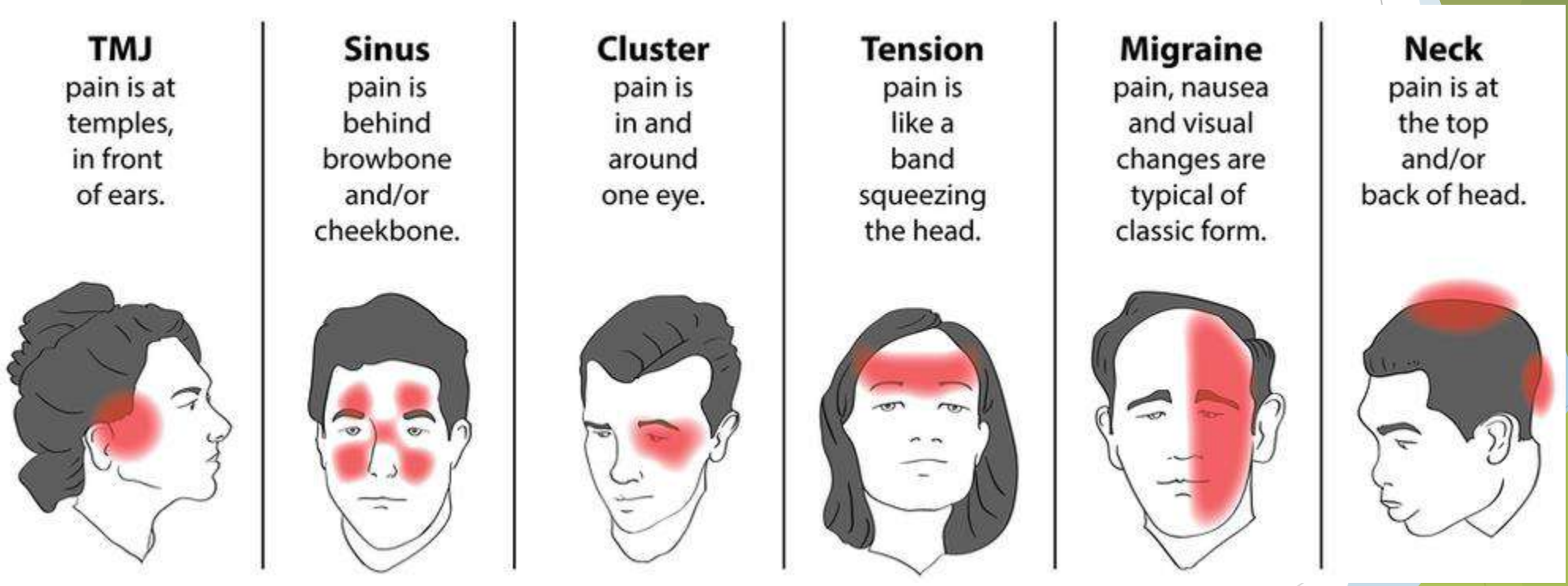
Nasal Specific Technique

- Aka Bilateral Nasal Specific (BNS) or Nasal Cranial Release (NCR)
- Developed by Dr. J. R. Stober of Portland, Oregon in the 1930s
- A balloon-assisted technique that adjusts the cranial plates of the skull
- A balloon is inserted to one of the six nasal passages. Once in place, it is slowly inflated, expanding the sinus opening and allowing excess fluid that has become stuck in the inflamed cavities to drain out.
- The inflation/pressure adjusts the sutures of the skull, especially the sphenoid, releasing impactions in the cranial sutures and relieving forces in the skull the skull.
- Once the balloons reach a certain point of inflation, they are removed, and the patient usually experiences immediate relief from sinus pressure.

Sinusitis in the ethmoid sinuses cannot be addressed with this technique


Frontal Sinus
Sphenoid Sinus
Maxillary Sinus

Typical Headache Location



Neck Pain

- Neck Pain is defined by the Global Burden of health 2010 Study as "pain in the neck with or without pain referred into one or both upper limbs that lasts for at least one day"

Facts about Neck Pain

- Prevalence is generally higher in women than in men, higher in high-income countries compared with low- and middle-income countries, higher in urban areas compared with rural areas and peaks at around 45 years of age
- The economic burden due to disorders of the neck is high, and includes costs of treatment, lost wages, and compensation expenditures. Disability related to neck pain and related reoccurrences can significantly impact on workforce productivity and the economics of households and communities. The economic burden of neck pain is second only to low back pain in workers' compensation claims in the United States and in Sweden, neck and shoulder problems account for 18% of all disability payments.

Childs, J.D., Cleland, J.A., Elliott, J.M., Teyhen, D.S., Wainner, R.S., Whitman, J.M., Sopky, B.J., Godges, J.J., Flynn, T.W., Delitto, A. and Dyriw, G.M., 2008. Neck pain: clinical practice guidelines linked to the International Classification of Functioning, Disability, and Health from the Orthopaedic Section of the American Physical Therapy Association. *Journal of Orthopaedic & Sports Physical Therapy*, *38*(9), pp.A1-A34.

According to the American Chiropractic Association…

The neck's susceptibility to injury is due in part to biomechanics. Activities and events that affect cervical biomechanics include extended sitting, repetitive movement, accidents, falls and blows to the body or head, normal aging, and everyday wear and tear.

The most typical cause of neck pain:

- Accidents and injuries
- Aging
- Osteoarthritis
- Spinal stenosis
- Degenerative disc disease
- Daily life (poor posture, obesity, and weak abdominal muscles)
- Fibromyalgia

Neck Pain with Soft Tissue Involvement

Cervical sprain/strain
Cervical discogenic pain syndrome
Cervical instability
Cervical meniscoid entrapment
Cervical radiculopathy
Torticollis (SCM involvement)

Cervical Sprain/Strain

- Soft tissue involved
  - Ligaments, capsule, muscles
- Causes
  - Acute or repetitive neck injuries (exercises, posture stress, etc)
  - Sudden unguarded movements
- Classic Presentation
  - Neck pain
  - Headache (usually cervicogenic) with possible tinnitus
  - Local swelling, redness
  - Shoulder, scapular, and/or arm pain
  - Difficulty sleeping due to pain
  - Possible visual disturbances, postural change/guarded movements, concussion

- Physical Exam Findings
  - Possible postural change and guarded movements
  - Local muscle tenderness, spasm, and hypertonicity, joint dysfunctions
  - Limited range of motion
  - Possible muscle weakness in muscle testing
  - Local pain with cervical distraction test

  Use O'Donoghue maneuver to distinguish sprain and strain
- Suggested Management
  - Initial stage
    - Ice and rest
    - TENS
  - 3+ days post-injury
    - Cervical manipulation as tolerated
    - Myofascial treatment
    - Stabilization exercises

Grading of Sprain/Strain

Degree/Severity	Fiber Damage	Findings	Healing Time
Grade I (mild)	Few, ~1-10%	• Minimal pain, swelling/tenderness • Slightly impaired movement/function • Triger points • Fixation & decreased joint play	7 days to 4 weeks
Grade II (moderate)	Many, ~11-50%	• Significant pain, noticeable swelling/tenderness • Impaired movement/function	2 weeks to 1 year
Grade III (severe) ***Refer for surgical evaluation***	Total, ~51-100%	• Significant pain, bruising, swelling, tenderness • Marked impaired movement/function • Palpable damage	2 months to > 1 year

Cervical Discogenic Pain Syndrome

- Soft tissue involved
  - Cervical intervertebral disc (IVD)
- Demographics
  - Females>Males, often between age 45-50
- Causes
  - Acute or repetitive neck injuries
  - Abnormal cervical spinal curvature
  - Sudden unguarded movements
  - Degenerative disc disease
- Classic Presentation
  - Immediate pain/pain shortly after injury
  - Pain referred into the shoulders, scapula, mid-back, arm, forearm, or fingers
  - Headache (usually cervicogenic), possible tinnitus

- Physical exam findings
  - Possible postural change and guarded movements
  - Local muscle tenderness, spasm, and hypertonicity, joint dysfunctions
  - Limited range of motion
  - Positive cervical distraction and compress tests
  - Confirm with MRI
- Suggested management
  - Ice and heat
  - Medications: anti-inflammatories
  - Cervical manipulation as tolerated
  - Physical therapy
  - Axial traction

Cervical Instability

- Soft tissue involved
  - Ligaments
- Joints at which the ligaments may be loose
  - Atlanto-occipital joint
  - Atlanto-axial joint
- Causes
  - Trauma or microinjuries & repetitive neck injuries
  - Genetic – Down Syndrome, Ehlers-Danlos Syndrome, Marfan Syndrome
  - Rheumatoid arthritis

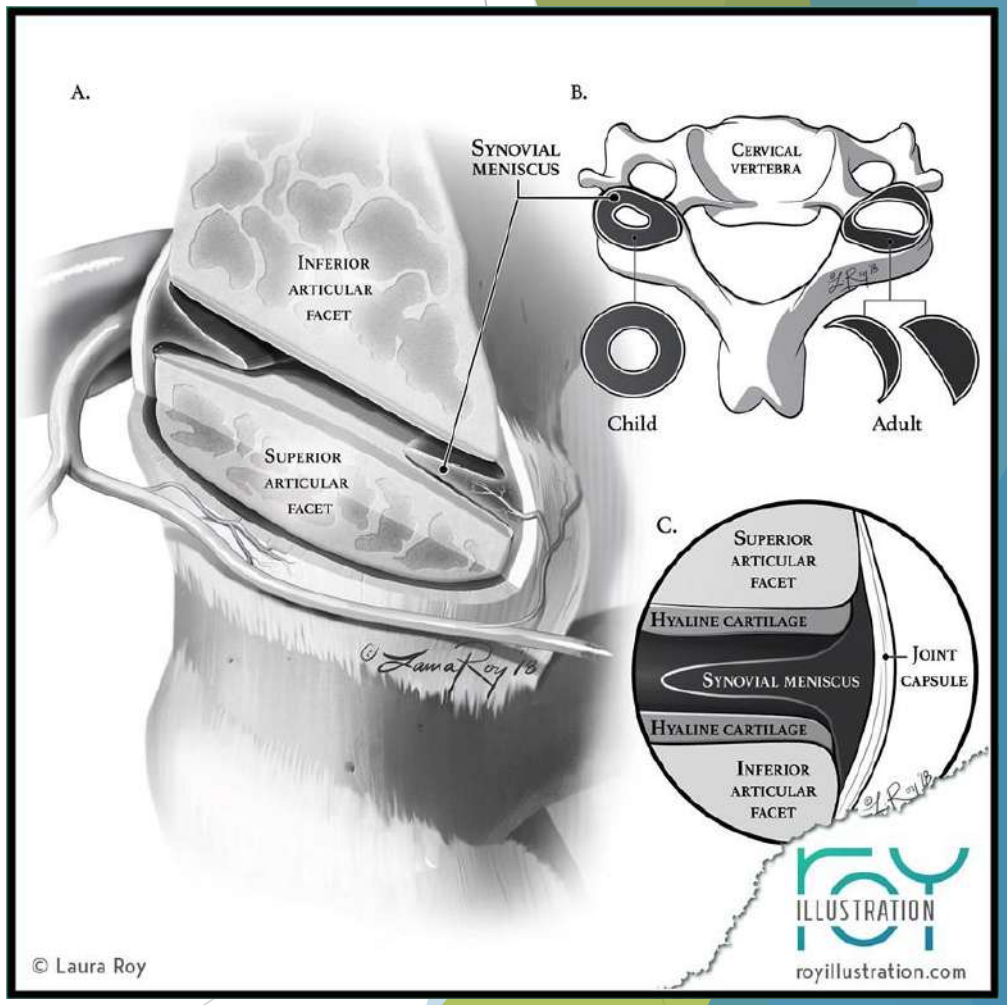
- Classic presentation
  - Shaking or unstable feeling in neck/head
  - A “catch” or “locking” in the neck
  - Better with rest and wearing a collar support
  - Worse when maintaining one posture for a long time
  - Occipital headache
  - Referred pain to the shoulders and the neck
  - Dizziness/imbalance

- Physical exam findings
  - Increased range of motion, may have pain with flexion or a visible asymmetry with a painful catch when return from flexion
  - Cervical muscles spasm and hypertonicity
  - Hypermobile joints with palpation, may have a “clunk” during the movement
  - Positive instability tests (alar ligament test, transverse ligament stress test, Sharp-Purser test, or Rust’s sign)
  - X-ray (lateral view, flexion-extension
    - Increased atlanto-dental interval (ADI) - >3mm in males, >2.5mm in females, >5mm in children
    - Abnormal anterior-posterior translation - >4mm

- Suggested management
  - Cervical manipulation to the hypomobile segments ONLY (temporary relief)
  - Myofascial release
  - Stabilization exercises
  - Ergonomic & posture training
  - In severe cases
    - Bracing
    - Refer for surgical or neurological consultation (Most common surgery – segmental spinal fusion)

Cervical Meniscoid Entrapment

- Soft tissue involved
  - Meniscoid – intra-articular fold of synovial membrane in the zygapophyseal joints (z-joint)
- Causes
  - Abnormal biomechanics in the cervical spine (a sudden “lock”)
  - History of neck injury, immobilization, instability or degenerative changes (i.e. sustained irregular posture)
- Classic presentation
  - Sharp neck pain from muscles spasm/guarding (acute locked neck syndrome) that worsens over time
  - Feeling a “catch” when return head to upright position
  - Limited and guarded neck movements



- Physical exam findings
  - Cervical muscles spasm and hypertonicity
  - Limited rang of motion in extension &/or rotation (flexion followed by extension and rotation – meniscoid becomes trapped in the z-joint
  - Local pain with cervical compression tests
  - Positive cervical distraction test
- Suggested management
  - Ice and rest
  - Cervical manipulation
  - Axial traction
  - Myofascial release, trigger point therapy

Cervical Radiculopathy

- Soft tissue involved
  - Cervical nerve roots (C7 nerve root is most common)
- Causes
  - Injuries (younger patients)
  - Degenerative changes/ spinal canal stenosis (older patients)
- Classic presentation
  - Aching/burning neck pain & radicular/shooting arm pain/numbness/tingling
  - Inflammation
  - Bakody's sign
  - Antalgic posture – head tilt away from affected side

- Physical exam findings
  - Tender cervical paraspinal muscles, especially on the affected side
  - Positive neurologic findings – muscle weakness, decreased sensation (dermatome), hyporeflexia (DTR)
  - Positive Valsalva, Cervical compression and distraction tests, arm squeeze test, brachial compression, and upper limb tension test
  - Confirm with MRI

- Suggested management
  - Reduced pain and inflammation - Decompression/axial traction, ice, pain relief medication, TENS
  - Cervical manipulation on segments adjacent to affected levels (Contraindicate to continue if radicular symptoms worsen)
  - Physical therapy
  - Acupuncture
  - Avoid aggravating loading & flexion positions/positions that narrows the foramens
  - Cervical pillow
  - Encourage aerobic activity as tolerated
  - Refer to neurologist if do NOT improve with comprehensive multidisciplinary rehabilitation protocol

Torticollis (aka wryneck, cervical dystonia)

- Soft tissue involved
  - SCM (most common) and other neck muscles
- Demographics
  - Rare but females>males, often between age 31-60
- Causes
  - Muscular damage from inflammation (myositis, sprain/strain)
  - Cervical spine injuries (disc herniation, subluxation, facet lock)
  - Cervical spondylosis

Types	Sub-types	Duration	Causes	Notes
Acquired	transient spasmotic torticollis	< 6 months	Activity/posture induced	Most common type
	idiopathic spasmotic torticollis	> 6 months	Idiopathic	
Congenital			Birth trauma, common in infants	A sign of Klippel Feil syndrome

- Classic presentation
  - Congenital – fixed asymmetry within hours of delivery
  - Acquired
    - Neck pain
    - Inability to turn the head, usually present as head tilted, rotated, and slightly flexed
    - Idiopathic/pseudotorticollis – inability to move the head in any direction WITHOUT pain
- Physical exam findings
  - Severe muscle spams and hypertonicity of the SCM, levator scapulae, scalenes, splenius &/or trapezius muscles
  - Limited range of motion
  - Multiple cervical joint restriction
  - Positive Kernig's or Brudzinski's signs

- Suggested management
  - Cervical manipulation as tolerated
  - Heat
  - Myofascial treatment – trigger point therapy, myofascial release, Post-isometric relaxation (PIR), general stretching
  - Isometric resisted exercises
  - Avoid prolonged positions

Post Isometric Relaxation (PIR)

- It is the effect of the decrease in muscle tone in a single or group of muscles, after a brief period of submaximal isometric contraction of the same muscle
- Benefits:
  - Reduce muscle spasms
  - Increase range of motion
  - Easier to adjust!

- How to perform:

1. The hypertonic muscle is taken to a length just short of pain, or to the point where resistance to movement is first noted.
2. A submaximal (10-20%) contraction of the hypertonic muscle is performed away from the barrier for between 5 and 10 seconds and the therapist applies resistance in the opposite direction. The patient should inhale during this effort.
3. After the isometric contraction, the patient is asked to relax and exhale while doing so. Following this, a gentle stretch is applied to take up the slack till the new barrier.
4. Starting from this new barrier, the procedure is repeated 2-3 times.

Post Facilitation Stretch (PFS)

- More aggressive than PIRT
- Benefits:
  - Reduce muscle spasms
  - Increase range of motion
  - Break up adhesions/scar tissues in chronic shortened muscles

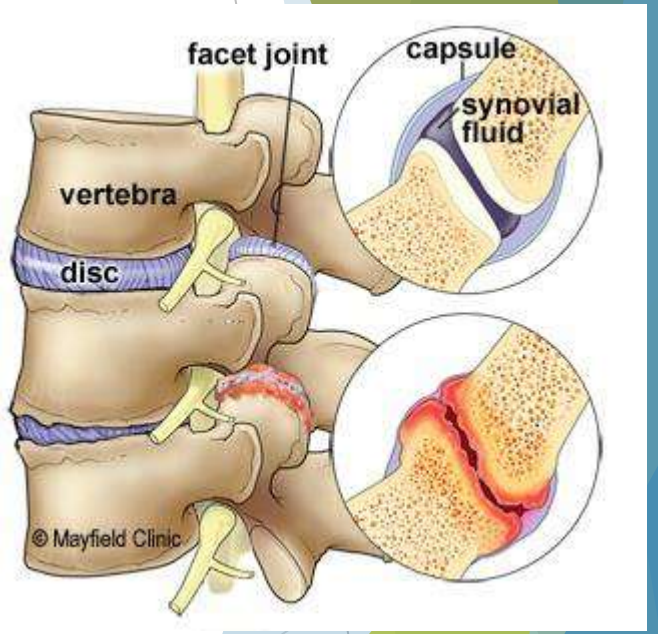
- How to perform:
  1. The hypertonic and shortened muscle is placed between a fully stretched and a fully relaxed state.
  2. The patient is asked to contract the agonist using a maximum degree of effort for 5–10 seconds while the therapist resists the patient's force.
  3. The patient is then asked to relax and release the effort, whereas the therapist applies a rapid stretch to a new barrier and is held for 10 seconds.
  4. The patient relaxes for approximately 20 seconds and the procedure is repeated between three to five times and five times more.
  5. Instead of starting from a new barrier, the muscle is placed between a fully stretched and a fully relaxed state before every repetition.

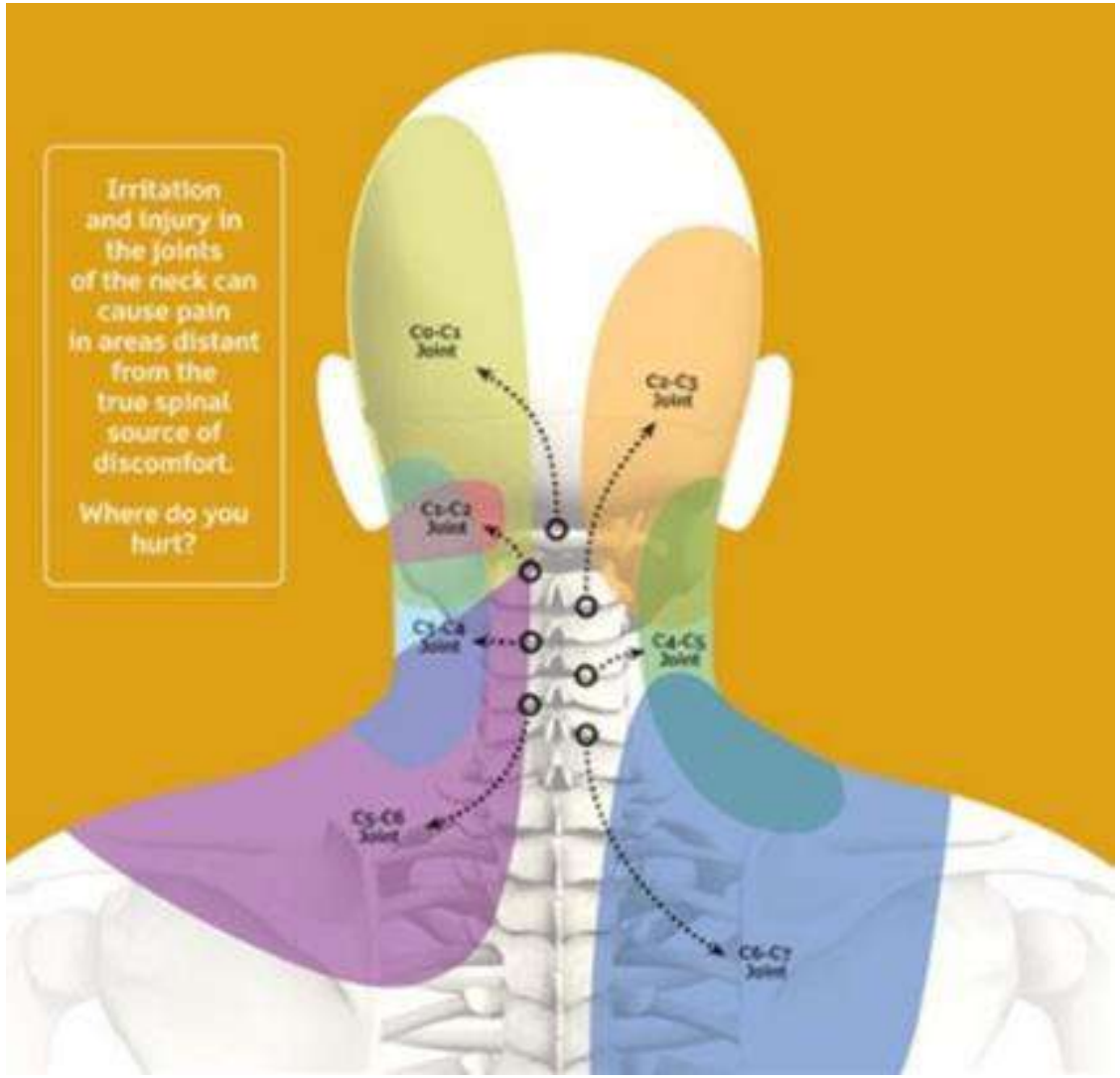
Neck Pain with Skeletal Involvement

Cervical facet syndrome
Cervical degenerative joint disease
Cervical spinal stenosis

Cervical Facet Syndrome

- Causes
  - Injuries to the cervical spine or disc (e.g. whiplash)
  - Osteoarthrosis or rheumatoid arthritis
  - Repetitive stress such as postural stress
- Classic presentation
  - Often has a minor (e.g. sudden turning of the head) to moderate (e.g. car accidents) traumatic onset of neck and arm pain
  - Dull, achy, sharp pain
  - Can be localized but often has a referred pain down the outer arm to the hand – pattern does NOT fit a specific dermatome but often implicates segmentally related facet joints of C5-C7





Sclerotogenous referred pain

Resembles radiating pain but it is a referred deep, dull ache from bone, ligaments, and joints

- Physical exam findings
  - Limited range of motion with increased pain on extension and rotation
  - Antalgic tilt
  - Possible muscle hypertonicity and spasm
  - Reduced pain with cervical distraction test
  - Increased pain with cervical compression
  - NO neurological deficits even with referred pain

- Suggested management
  - Cervical manipulation – most beneficial
  - Cervical traction
  - Myofascial treatment – trigger point therapy, myofascial release
  - Stretching

Cervical Degenerative Joint Disease

Aka osteoarthrosis, cervical spondylosis

- Causes
  - Aging
  - Repetitive stress on the joint (e.g. obesity, postural stress, chronic repetitive motions/occupational)
  - Joint injuries
  - Genetics
  - Hemochromatosis – a metabolic condition in which the body produces too much iron
  - Often associated with facet syndrome and/or disc disease
- Demographics
  - > age of 50
  - 45% are asymptomatic but has radiographic evidence
  - Degeneration usually occurs earlier in MEN

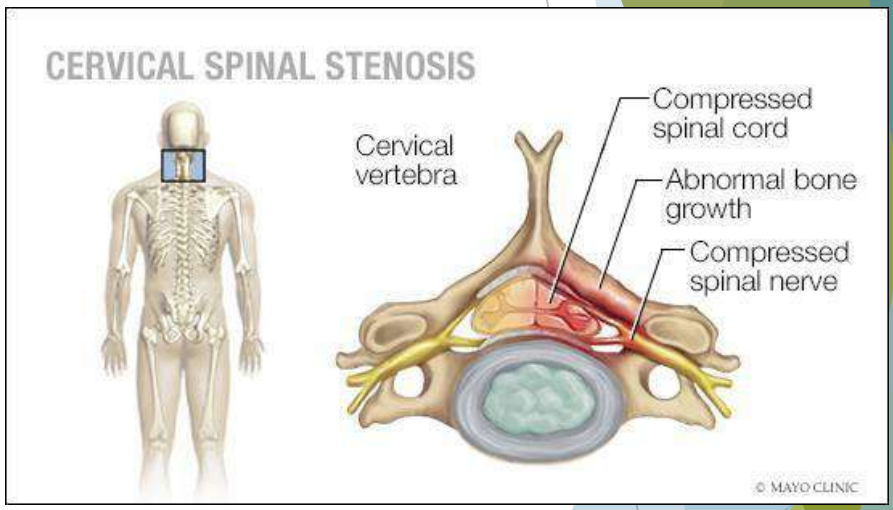
- Classic presentation
  - Chronic neck pain
  - Dull ache
  - Morning stiffness and pain
  - Loss of flexibility
  - Aggravated by repetitive or heavy use
  - Possible swelling

- Physical exam findings
  - Limited range of motion
    - More pain with flexion (anterior anatomy involved – herniation/disc damage)
    - More pain with extension (posterior anatomy involved – facets/IVF encroachment)
  - Local tenderness with palpation
  - Positive cervical compression
  - Positive cervical distraction
  - Best with x-ray confirmation
  - Most common segments involve – C5-C7

- Suggested management
  - Cervical manipulation as tolerated
  - Cervical traction
  - Myofascial treatment – trigger point therapy, myofascial release
  - Diet and exercise
  - Postural training
  - Range of motion exercise

Cervical Spinal Stenosis

- Causes
  - Aging
  - Repetitive stress on the joint (e.g. smoking, postural stress, chronic repetitive motions/occupational)
  - Previous joint injuries
  - Genetic
  - Tumors
  - Structural alteration - Bone spurs, ligaments thickening, herniated discs, often as a result of cervical DJD
- Demographics
  - Age of 50s-60s



- Classic presentation
  - Neck pain
  - Neurologic symptoms (weakness, tingling, numbness) in the upper and/or lower extremities
  - Unilateral or bilateral (more common)
  - Poor balance
  - Severe cases – incontinenece, paralysis

- Physical exam findings
  - Best to get radiographic evidence – x-ray, CT, MRI
  - Observe for abnormal gait
  - Positive Romberg test and tandem stance (balance test)
  - Positive Spurling's
  - Positive neurologic findings – muscle weakness, decreased sensation (dermatome), hyporeflexia (DTR)

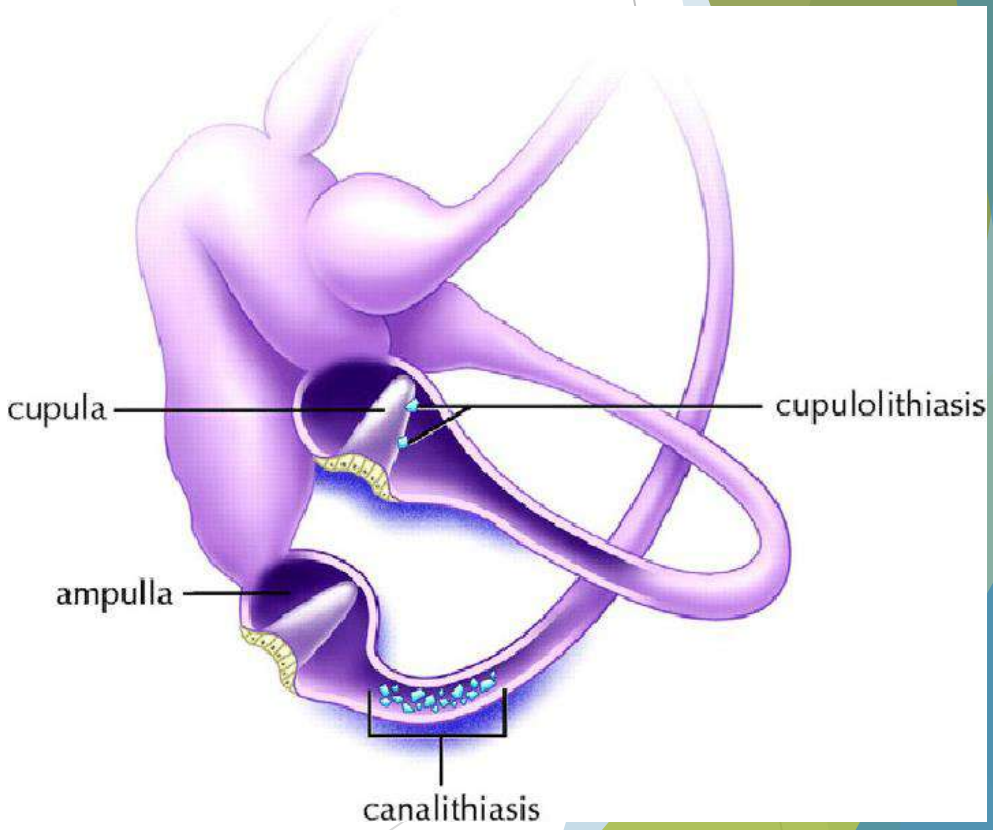
- Suggested management
  - Cervical manipulation as tolerated, AFTER red flags like tumors are ruled-out
  - Physical therapy
  - Acupuncture
  - Medication – temporary pain relief
  - Anti-inflammatory diet and aerobic exercises
  - Posture training or re-education
  - Refer to neurologist or spinal surgery if do NOT improve with comprehensive multidisciplinary rehabilitation protocol

Other Conditions

- Benign paroxysmal positional vertigo
- Stroke
- Bell’s palsy

Benign Paroxysmal Positional Vertigo (BPPV)

- Causes
  - Canalithiasis theory – free-floating particles (otoconia) in the posterior semicircular canal
  - Cupulolithiasis theory - otoconial debris attached/adhered to the cupula of the posterior semicircular canal
- Demographics
  - Females>Males, age >50 most common
  - History of head trauma or damage to the vestibular system



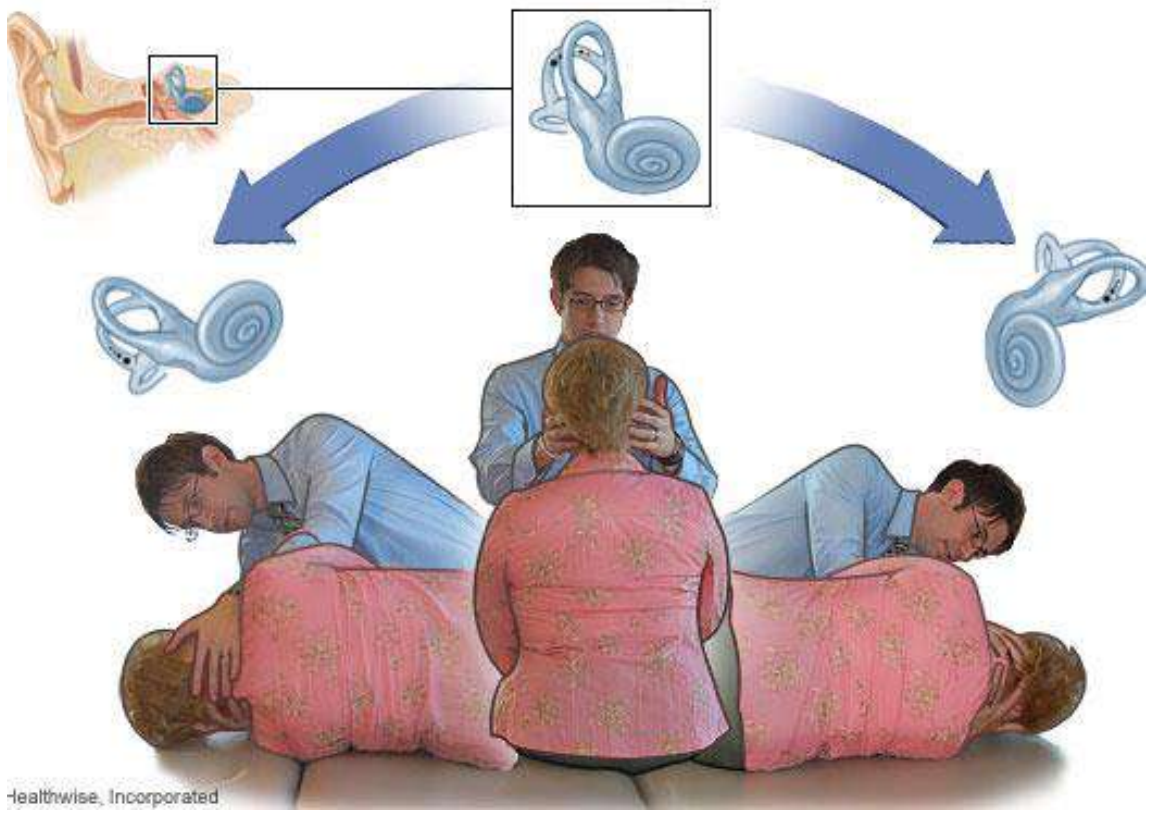
- Classic presentation
  - Dizziness
  - Vertigo may last for seconds up to several minutes
  - Poor balance
  - Worse with neck extension
  - Some with nausea and vomiting

- Physical exam findings
  - Dix-Hallpike maneuver – Gold standard test
  - Nystagmus

	Pattern	Indication
Nystagmus	Rotatory with latency of limited duration	Pathognomonic
	Pure horizontal	Horizontal canal involvement
	Sustained	Cupulolithiasis

- Suggested management
  - Epley's maneuver
  - Semont's maneuver
  - Cervical manipulation – beneficial if the vertigo is cervicogenic origin

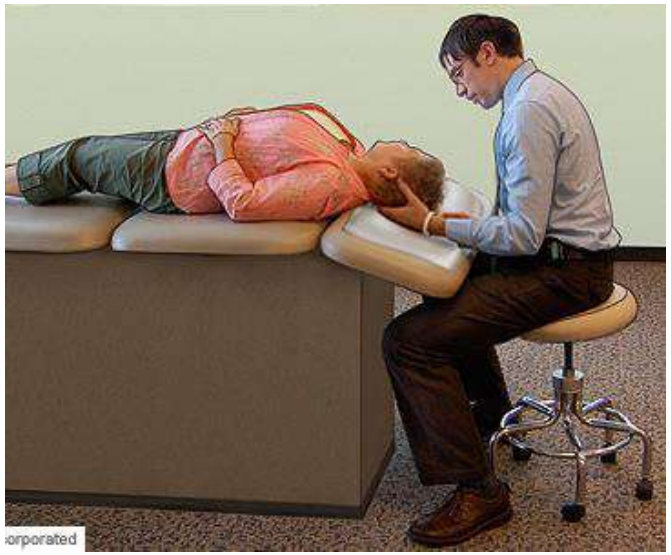
Semont's Maneuver

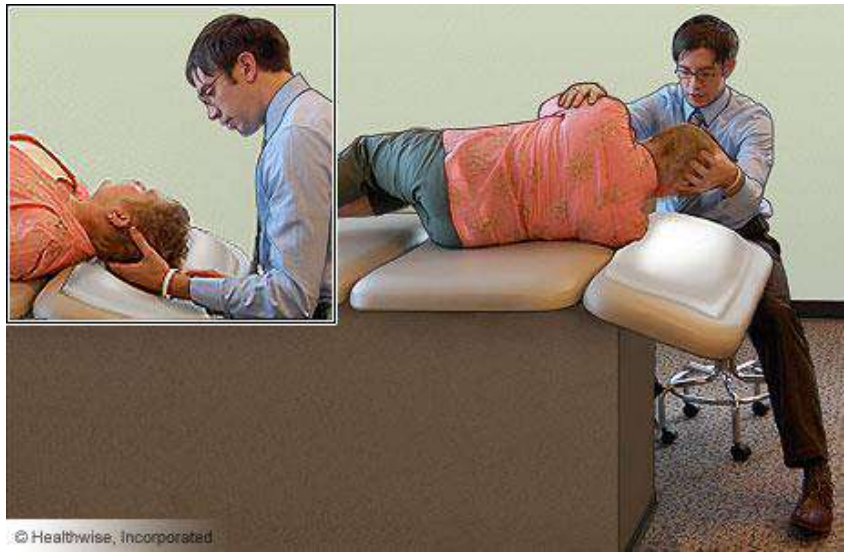


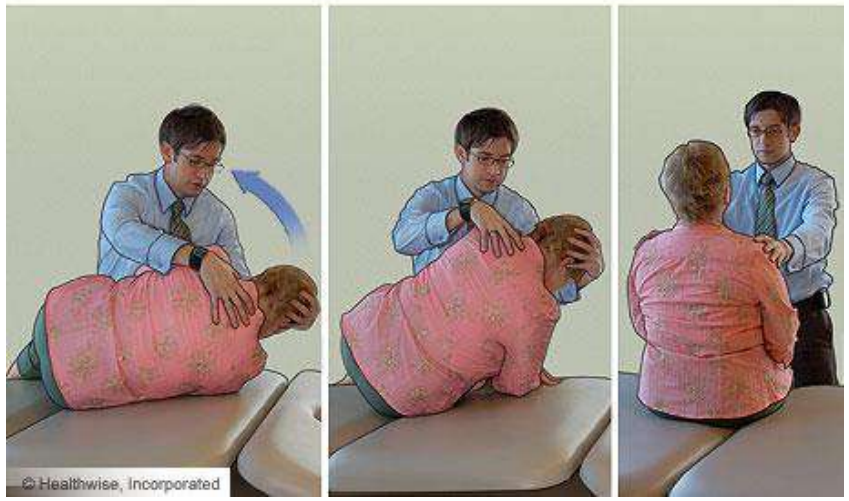
1. Patient seated – head at midline
2. Turns head 45 degrees AWAY from affected side
3. Assist patient in lying on the affected side while looking UP to the ceiling. Hold for 30 secs
4. Quickly bring patient to the other side lying while looking DOWN to the table. Hold for 30 secs
5. Return to seated position slowly

Epley's Maneuver

1. Patient seated, turns head 45 degrees TOWARD the affected side.
2. Slowly recline patient to supine position with head turned, the affected ear DOWN. (NO nystagmus should be observed) Hold until vertigo stops.
3. Slowly turn head to the other side.







4. Patient slowly rolls body so shoulders are aligned perpendicularly to the floor, affected ear UP while head kept at 45 degrees turned. Hold until vertigo stops.
5. Slowly assist patient back to sitting position.
6. Turn head to midline with 20 degrees flexed.

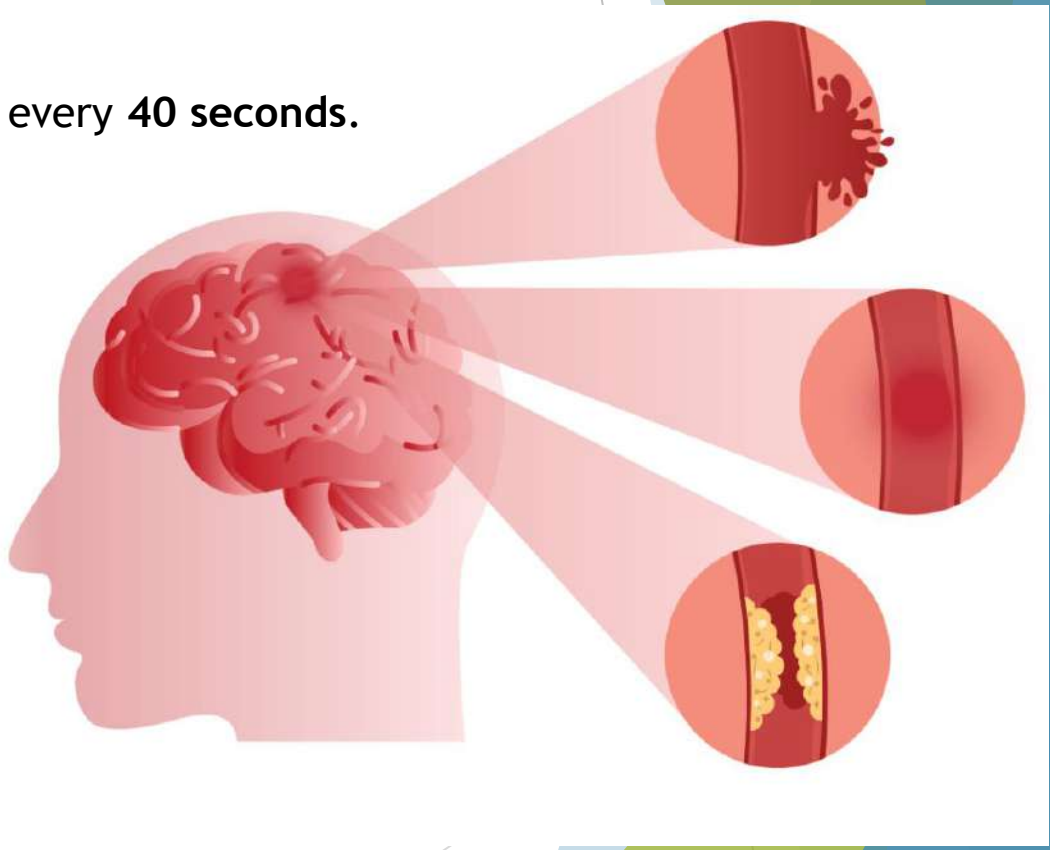
Differential Diagnosis for Dizziness

Condition	Duration	Presentation
BPPV	minutes	• Sudden onset • Affected by a particular head position • Nystagmus that fatigues and adapts
Meniere's disease	Hours to days	• Sudden onset • Recurrent severe vertigo • Often with tinnitus • History of diabetes or problems with fluid retention
Labyrinthitis	Days to weeks	• Sudden onset • Nystagmus is spontaneous, persistent, predominantly linear-horizontal • Affected little by head position • Often with hearing loss
Vestibular neuronitis	Days to weeks	• Same as labyrinthitis but WITHOUT hearing loss
Vertebrogenic vertigo		• History of a whiplash injury • Dizziness is reproduced by body rotation with the head held constant

Stroke

Aka cerebrovascular accident (CVA)

According to the CDC, "someone in the United States has a stroke every **40 seconds**. Every **4 minutes**, someone dies of stroke."



- Causes
  - Hypertension
  - Cardiac disease
  - Smoking
  - Diabetes
  - High cholesterol
  - Poor general health
  - Trauma
  - Overtreatment with blood thinners
- Demographics
  - Increased risk with age >45, highest in age 60s-70s

- Types
  - Ischemic strokes (most common, ~87%)
    - Blocked/narrowed blood vessels in the brain due to thrombosis or embolism
  - Hemorrhagic stroke (severe type)
    - Ruptured or leaking blood vessels in the brain causing damage to an area of the brain
      - Subarachnoid hemorrhage (nuchal rigidity/neck stiffness without fever)
      - Intracerebral hemorrhage (more common)
  - Transient ischemic attack (TIA), aka ministroke
    - Temporary decrease in blood supply to part of the brain
    - Last minutes and patients may not remember the episode
    - Increase risk of having a full-blown stroke

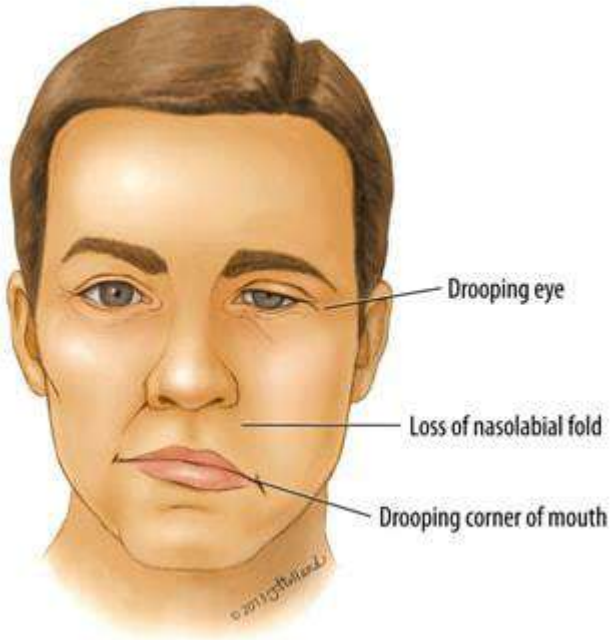
- Classic presentation
  - Sudden onset
  - Sudden severe headache
  - Sudden weakness/numbness in face or limbs on one side of the body
  - Confusion, trouble talking or understanding conversation or verbal instruction
  - Vision problem (monocular or binocular visual loss)
  - Trouble walking or maintaining balance
  - If with nausea, vomiting, seizures, and changes in level of consciousness – hemorrhagic strokes

- Physical exam findings
  - Observe gait and balance
  - Check mental status (name, date, time, etc.)
  - Sensory test for light touch, vibration
- Suggested management
  - MEDICAL EMERGENCY – immediate referral to an emergency room!

Bell's Palsy

Aka Acute facial palsy of unknown cause

- Causes
  - Unknown
  - Possibly caused by a viral infection or an inflammatory reaction in the facial nerve
- Demographics
  - Any age



- Classic presentation
  - Sudden onset, progress within hours
  - Unilateral facial weakness/paralysis
  - Might have pain around jaw and ear
  - Unilateral facial distortion - drooping eye and corner of the mouth, loss of nasolabial fold
  - Drooling
  - Difficulty eating and drinking
  - Inability to make facial expression (smiling, frowning, or closing one eye) muscle twitches in the face
  - Headache
  - A loss of taste
  - Tinnitus

- Physical exam findings
  - Unilateral facial distortion
  - Fail to perform facial nerve test on the involved side
- Suggested management
  - Most self-resolved within weeks
  - Chiropractic adjustment to the occipital, cervical spine and TMJ
  - Physical therapy
  - Acupuncture
  - Facial exercises

Red Flags when Evaluating Neck Pain

Red Flags	Historic Findings
Suspected fracture	• Trauma • Osteoporosis • Corticosteroid therapy
Tumor/Cancer/ Malignancy	• History of cancer • Age >50 • Systemic upset (unexplained weight loss, night sweats, fevers, etc) • Nocturnal pain • Possible neurologic deficits
Spinal cord compromise/Myelopathy	• Severe/progressive neurological deficit (motor weakness, sensory abnormality, hyper-reflexia, gait abnormality) • Painful stiffness neck • Bowel/bladder dysfunction • Sexual dysfunction

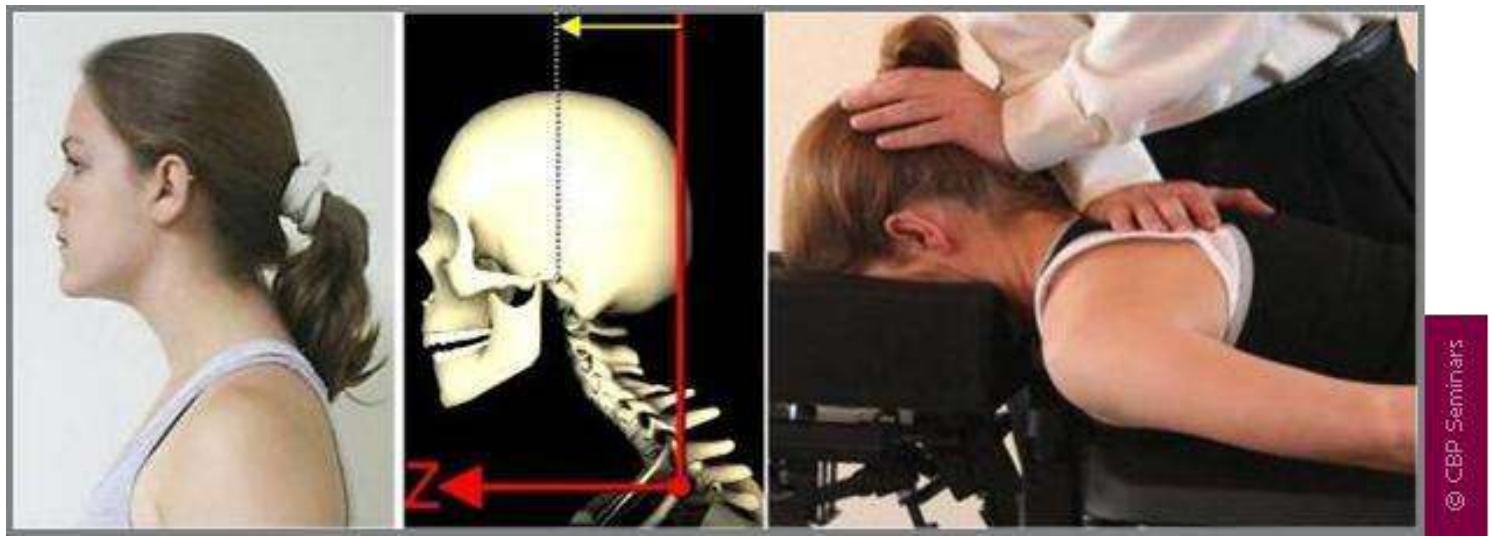
Red Flags	Historic Findings
Infections	• Fever • Neck stiffness • Significant tenderness over vertebral bodies • Intravenous drug use • Immunocompromise • Previous neck surgery
Inflammatory arthritis (ankylosis spondylitis - AS)	• Neck pain • Morning stiffness • Swelling in multiple joints • For AS: Genetic factor – HLA-B27; worse with rest; lower back pain
Vascular emergency (carotid/vertebral artery dissection, brain hemorrhage/mass lesion)	• Sudden and intense onset of headache • Face and neck pain • Speech or swallowing problems • Vertigo • Vision problems

Training and Nutrition

Chiropractic Biophysics (CBP) Mirror Image® Posture Exercise

- Donald Harrison, D.C.
- focuses on structural correction of the spine - the underlying foundation of the spine

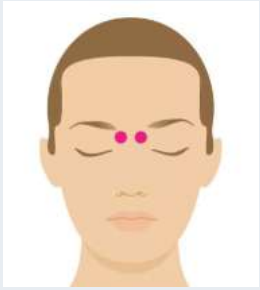
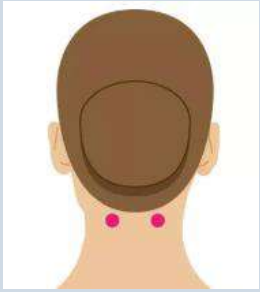
Mirror Image exercise example for the abnormal forward head posture. The patient has an abnormal forward head (translation) posture and the skeletal animation shows what happens to the spine with this posture. On the right is two different CBP® Mirror Image exercises: one with just the patient's muscles and body as resistance and the other with an elastic band for increased contraction effort. The patient actively maneuvers their posture into the opposite or Mirror Image position.

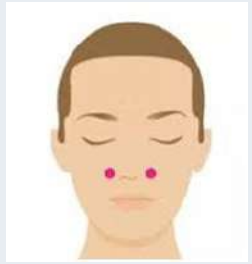


Mirror Image adjustment example for the head posture. The patient has forward head posture (translation) and the skeletal animation shows what happens to the spine with this posture. On the right is the CBP Mirror Image adjustment. The posture is placed in its opposite position and then a Chiropractic adjustment is performed.

Acupressure Points for Headaches

Use the thumb/index finger of one hand to apply firm, circular pressure to the points for 30 sec to 1 minute. Release and repeat.

Acupressure Points	Location	Symptoms Relieved
Union Valley		Head and neck tension caused by headache
Drilling Bamboo		Headaches caused by eyestrain and sinus pressure
The Gates of Consciousness		Headache caused by tension in the neck

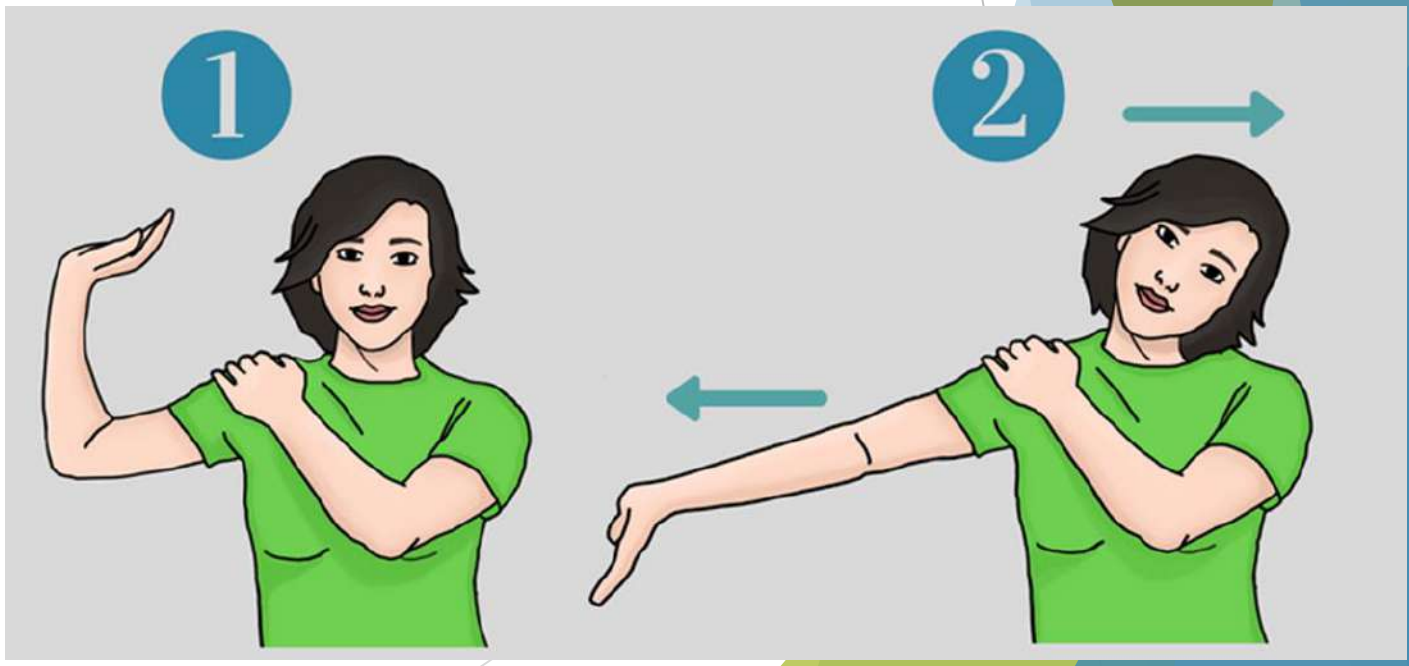
Acupressure Points	Location	Symptoms Relieved
The Third Eye		Headaches caused by eyestrain and sinus pressure
Welcome Fragrance		Headaches caused by eyestrain and sinus pressure
The Shoulder Well		Stiffness and pain in the head and neck

Exercises for Pinched Nerves

Nerve Flossing – mobilize nerves for symptoms relief and build up strength and flexibility

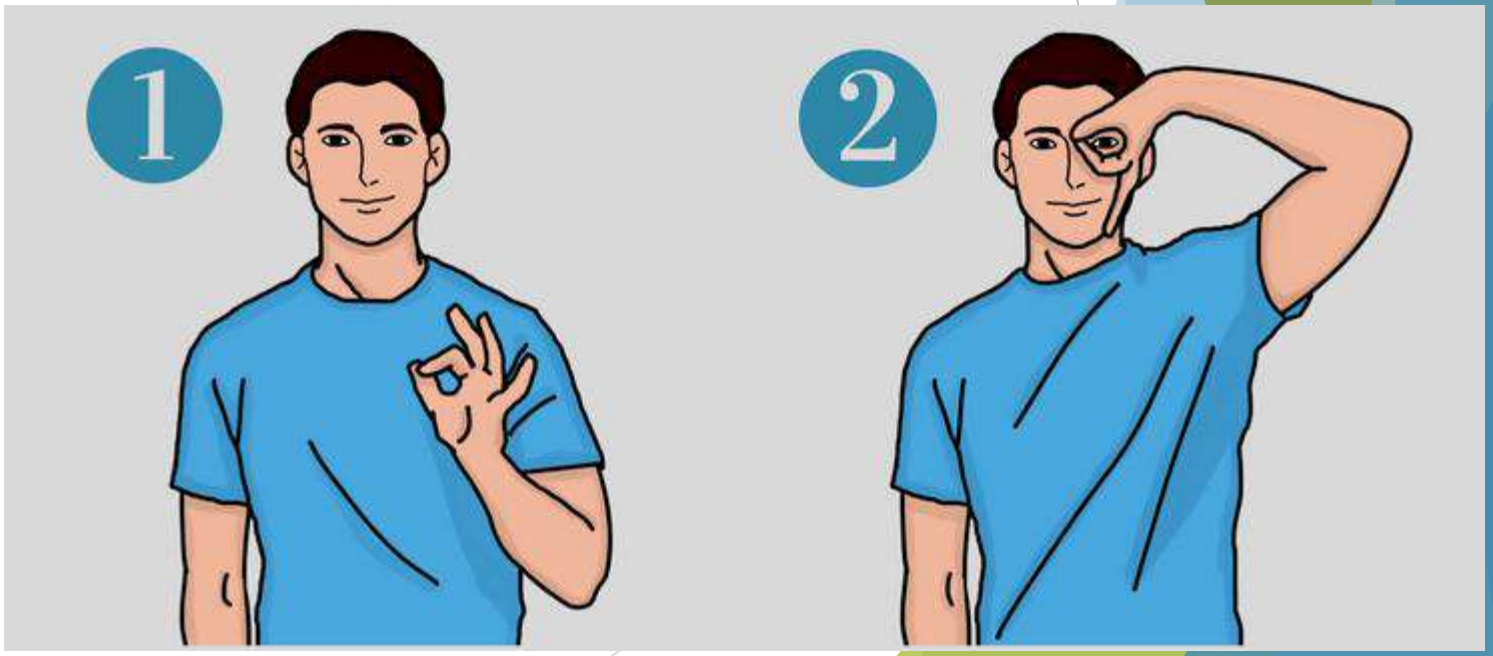
Only perform the exercises in a comfortable range. Hold each final position for about 2 seconds and slowly release, repeat for 10-15 repetitions.

- **Median Nerve Glide**
  1. Upright position with good posture. Bring the flexed elbow up to shoulder height with palm facing up.
  2. Slowly straighten the elbow and extend wrist and fingers while slowly tilt head to the opposite side.



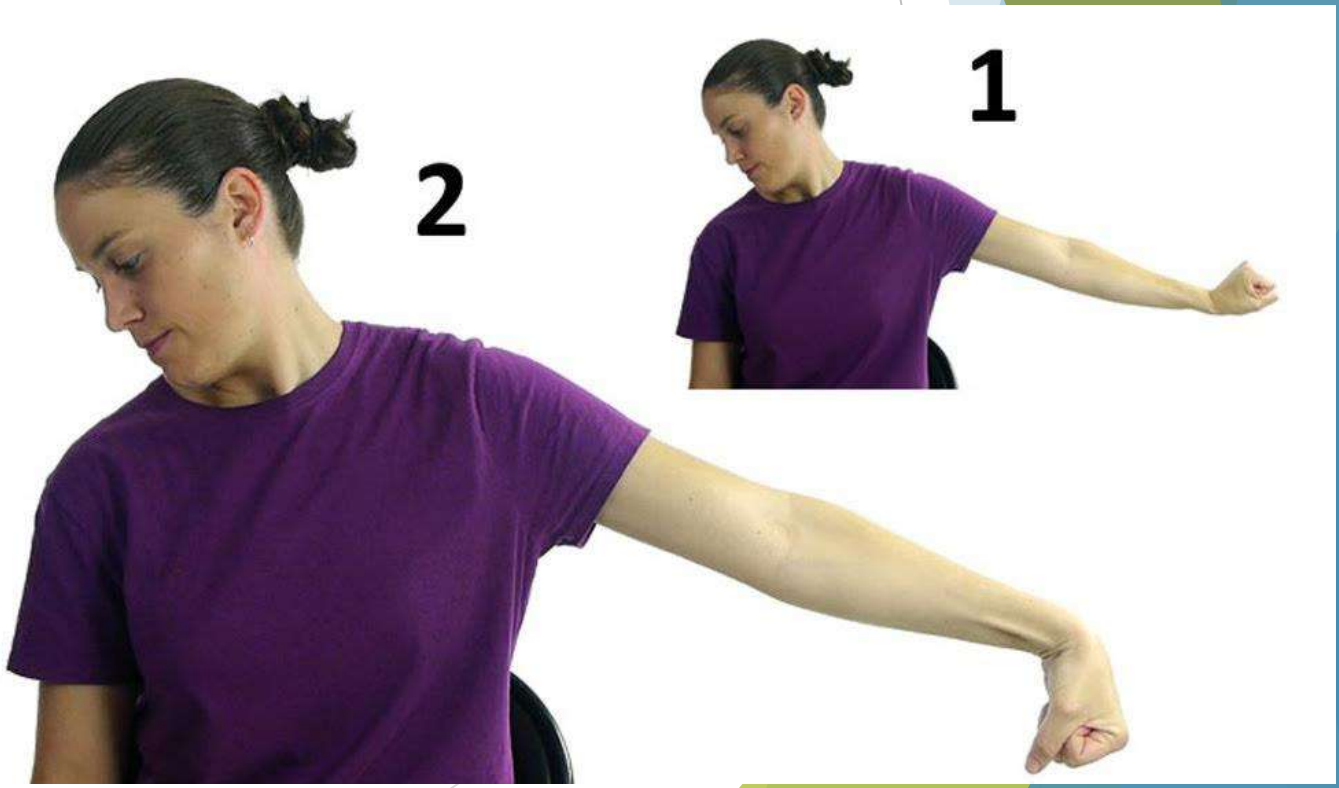
Ulnar Nerve Glide

1. Upright position with good posture. Make an “OK” sign with fingers.
2. Slowly bring elbow out to the side, raising arm up and place the 3 fingers on the jaw line. Then bring the “O” toward the eye.



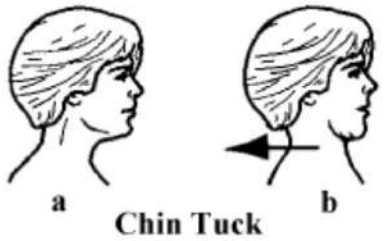
Radial Nerve Glide

1. Upright position with good posture. Head turned 45 degrees away from affected side and flexed. Arm down at the side of the hip with palm facing back.
2. Slowly flex the wrist and pull the shoulder back into extension.

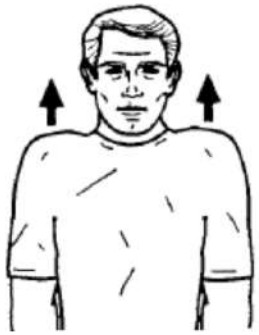


Sample Exercises for Stabilization

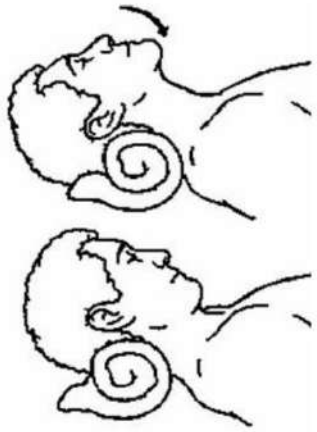
- **CHIN TUCK**
  - Pull your chin back (as if trying to make a double chin) while keeping your eyes level.



Chin Tuck

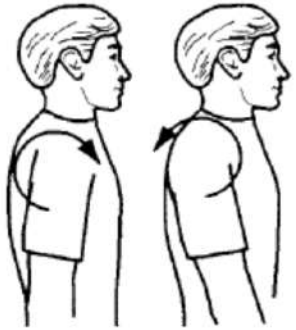


- **SHOULDER SHRUGS**
  - Shrug your shoulders, bringing them up towards your ears.
  - Relax and repeat.

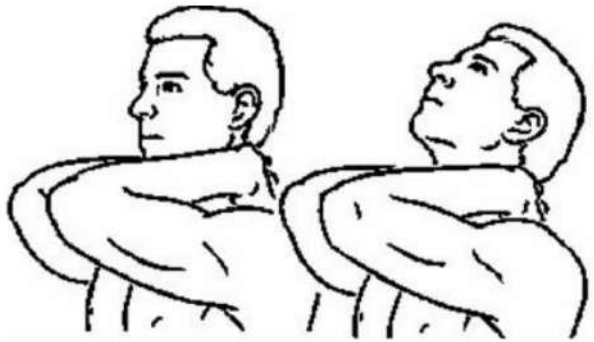


- **CHIN TUCK INTO TOWEL**
  - With a rolled towel under neck, gently pull your chin back without lifting the head.

- **SHOULDER ROLLS**
  - Roll your shoulders forward in a circle.
  - Then, roll your shoulders backwards in a circle.
  - Relax and repeat.



- **CERVICAL EXTENSION**
  - With hands grasping the base of the neck, extend the neck as far as possible.
  - **Option:** perform with a chin tuck

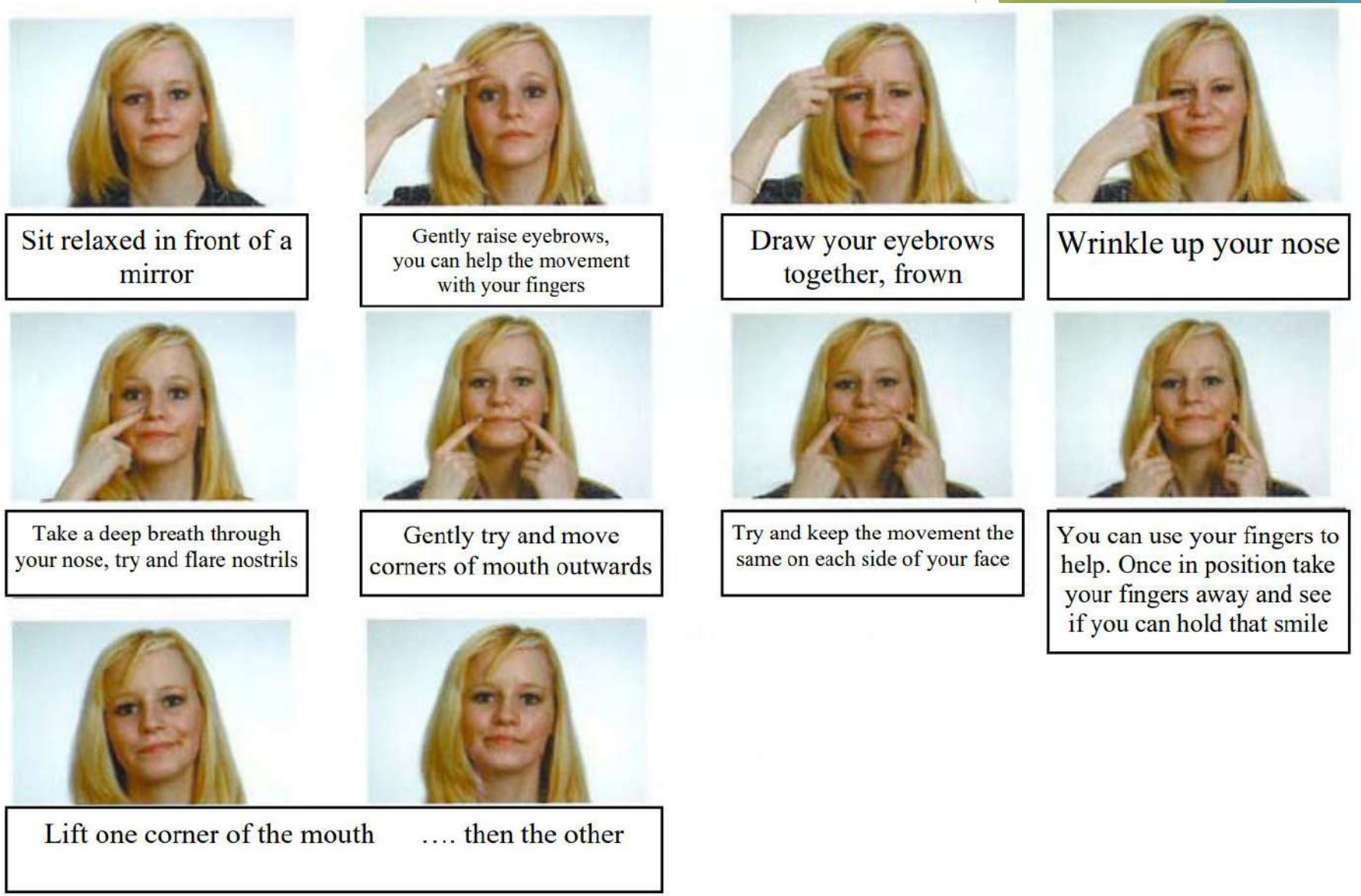


- **SCAPULAR RETRACTION**
  - Try to bring your shoulder blades together in back of you.
  - Relax and repeat.

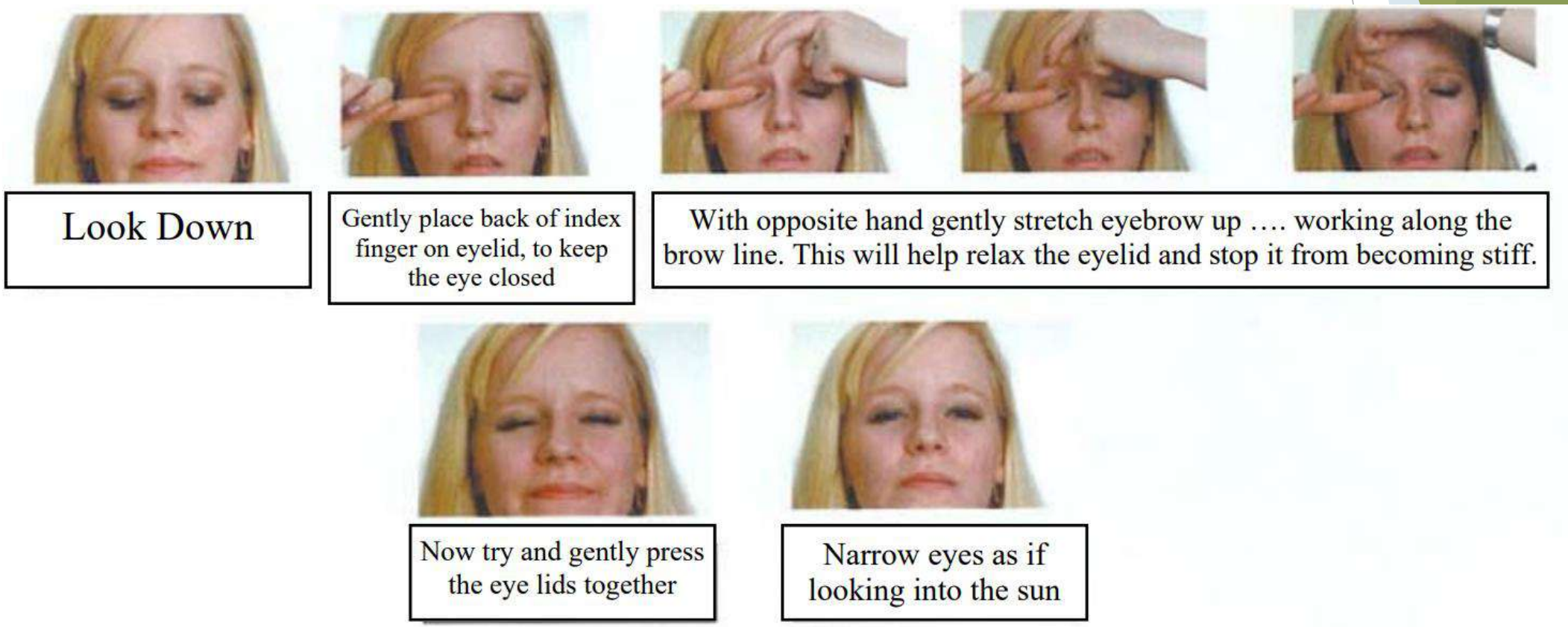
Exercises for Bell's Palsy

- Facial stimulation – warm up
  1. Actively - begin by trying to move every part of the face slowly and gently
  2. Passively – using the fingers to gently lift/massage different past of the face

- Facial Exercises



- Eye Exercises (to close)



Nutrition

- Anti-inflammatory Diet
- Low-Tyramine Diet

Anti-inflammatory Diet

- For pain and inflammation
- Favors fruits and vegetables, foods containing omgega-3 fatty acids, whole grains, lean protein, healthful fats, and spices.
- Discourages or limits the consumption of processed foods, red meats, and alcohol.

Food Category	Types of Food	Role in inflammation control and injury healing
Antioxidants **Vitamin A, C, E** **Various seasonings**	Vitamin A: carrots, sweet potatoes, leafy greens (kale, spinach), broccoli Vitamin C: peppers, citrus, strawberries, guava, kiwi, pineapple Vitamin E: almonds, spinach, avocado, sunflower seeds, butternut squash Seasonings: turmeric (curry), garlic, cinnamon, rosemary	Help control oxidative stress caused by exercise and injury
Anthocyanins: purple, red, and blue foods	Blackberries, blueberries, cherries, cranberries, eggplant, grapes, plums, blood orange, red or purple skinned potatoes, radishes	Work to reduce inflammation and to help promote muscle pain and reduce soreness
Vitamin D	Fatty fish(tuna, mackerel, and salmon); foods fortified with vitamin D (some dairy products, orange juice, soy milk, and cereals), cheese, egg yolks	Helps reduce inflammation within the body
High quality protein	Meat, fish, eggs, and dairy products	Reduce exercise induced muscle damage and support muscle health
Nitric Oxide and Nitrates	Beets, celery, and leafy greens	Nitrates convert to nitric oxide in the body which help increase blood flow helping to reduce inflammation and optimize recovery
Omega 3 Fatty Acids	Fatty fish(salmon, mackerel, tuna), chia & flax seeds, walnuts	Support brain health and reduce inflammation

FOODS THAT FIGHT INFLAMMATION

Chronic inflammation has been linked to cancer, heart disease, diabetes, arthritis, depression, and Alzheimer's. Fight inflammation with a healthy diet.

Harvard HEALTH

ANTI-INFLAMMATION FOODS

Tomatoes

Fruits

Strawberries, blueberries, oranges and cherries.

Nuts

Almonds, walnuts, and other nuts.

Olive oil

Leafy greens

Spinach, kale, collards, and more.

Fatty fish

Salmon, mackerel, tuna, and sardines.

INFLAMMATION FOODS

Fried foods

Sodas

Refined carbs

Lard

Processed meats

Diet for Headaches

- Common food triggers for headaches
  - Caffeine
  - Alcohol
  - Sulfites – found in many processed food
  - MSG
  - Aged cheese
  - Raw onions
  - Tyramine - natural by-product of protein breakdown. Its content in food increases as food, especially high protein foods, age. Because it is a naturally-occurring substance and is not added to food, tyramine is not listed on food labels.

Low-Tyramine Diet

- General Guidelines

- Each day eat three meals with a snack at night or six small meals spread throughout the day.
- Avoid eating high sugar foods on an empty stomach, when excessively hungry, or in place of a meal.
- All food, especially high protein foods, should be prepared and eaten fresh. Be cautious of leftovers held for more than one or two days at refrigerator temperature. Freeze leftovers that you want to store for more than 2 or 3 days.
- Cigarette and cigar smoke contain a multitude of chemicals that will trigger or aggravate your headache. If you smoke, make quitting a high priority. Enter a smoking cessation program.

- The foods listed in the "CAUTION" column have smaller amounts of Tyramine or other vasoactive compounds. Foods with an * may contain small amounts of Tyramine. Other foods in the "USE WITH CAUTION" column do not contain Tyramine but are potential headache "triggers". If you are taking an MAO inhibitor (Monoamine Oxidase Inhibitor) you should test the use of restricted foods in limited amounts.
- Each person may have different sensitivities to certain level of Tyramine or other vasoactive compounds in foods.

Food Group	Allowed	Use With Caution	Avoid
Meat, Fish, Poultry, Eggs	Freshly purchased and prepared meats, fish, and poultry Eggs Tuna fish, tuna salad (with allowed ingredients)	Bacon*, sausage*, hot dogs*, corned beef*, bologna*, ham*, any luncheon meats with nitrates or nitrites added. Meats with tenderizer added caviar	Aged, dried, fermented, salted, smoked, or pickled products. Pepperoni, salami, and liverwurst. Non-fresh meat or liver, pickled herring
Dairy	Milk: whole, 2% or skim Cheese: American, cottage, farmer, ricotta, cream cheese, Velveeta, low-fat processed	Yogurt, buttermilk, sour cream: ½ cup per day Parmesan* or Romano* as a garnish (2 tsp.) or minor ingredient	Aged cheese: blue, brick, brie cheddar, Swiss, Roquefort, stilton, mozzarella, provolone, emmentaler, etc.
Breads, Cereals, Pasta	Commercially prepared yeast Product leavened with baking powder: biscuits, pancakes, coffee cakes, etc. All cooked and dry cereals	Homemade yeast leavened breads and coffee cakes Sourdough breads	Any with a restricted ingredient

Food Group	Allowed	Use With Caution	Avoid
Vegetables	Asparagus, string beans, beets, carrots, spinach, pumpkin, tomatoes, squash, zucchini, broccoli, potatoes, onions cooked in food, Chinese pea pods, navy beans, soy beans, any not on restricted list	Raw onion	Snow peas, fava or broad beans, sauerkraut, pickles and olives Fermented soy products like miso, soy sauce, and teriyaki sauce
Fruits	Apple, applesauce, cherries, apricots, peaches, any not on restricted list	Limit intake to ½ cup per day from each group: Citrus: orange, grapefruit, tangerine, pineapple, lemon and lime Avocados, banana, figs*, raisins*, dried fruit*, papaya, passion fruit, and red plums	
Nuts and Seeds			All nuts: peanuts, peanut butter, pumpkin seeds, sesame seeds, walnuts, pecans

Food Group	Allowed	Use With Caution	Avoid
Soups	Soups made from allowed ingredients, homemade broths	Canned soups with autolyzed or hydrolyzed yeast*, meat extracts*, or monosodium glutamate*(MSG)	
Beverages	Decaffeinated coffee, fruit juices, club soda, caffeine-free carbonated beverages	Limited caffeinated beverages to no more than 2 servings per day: Coffee and tea: 1 cup = 1 serving carbonated beverages and hot cocoa or chocolate milk: 12oz = 1 serving Limit alcoholic beverages to one serving: 4oz Riesling wine, 1.5oz vodka or scotch per day = 1 serving per day (May need to omit if on MAOI)	Alcoholic beverages: Chianti, sherry, burgundy, vermouth, ale, beer, and non-alcoholic fermented beverages. All others not specified in caution column
Desserts & Sweets	Any made with allowed foods and ingredients: sugar, jelly, jam, honey, hard candies, cakes, cookies	Chocolate based products: ice cream (1 cup), pudding (1 cup), cookies (1 average size), cakes (3" cube), and chocolate candies (½oz). (All count as one serving of caffeinated beverage)	Mincemeat pie

Food Group	Allowed	Use With Caution	Avoid
Ingredients Listed on Food Labels	Any not listed in the restricted section		MSG* (in large amounts), nitrates and nitrites (found mainly in processed meats), yeast, yeast extracts, brewers yeast, hydrolyzed or autolyzed yeast, meat extracts, meat tenderizers (papain, bromelin) seasoned salt (containing MSG), soy sauce, teriyaki sauce
Fats, Oils, and Miscellaneous	All cooking oils and fats White vinegar Commercial salad dressing with allowed ingredients All spices not listed in restricted ingredients	Wine, apple, or other fermented vinegars*	

What research shows about chiropractic

For Headaches

- “Six to eight sessions of upper cervical and upper thoracic manipulation were shown to be more effective than mobilization and exercise in patients with CH, and the effects were maintained at 3 months.”
  Dunning et al. (2016) BMC Musculoskeletal Disorders
- “There was a linear dose-response relationship between [spinal manipulative therapy] visits and days with [cervicogenic headache]. For the highest and most effective dose of 18 SMT visits, CGH days were reduced by half and about 3 more days per month than for the light-massage control.”
  Haas et al. (2018) Spine
- “On average, [spinal manipulative therapy]+[home exercise and advice (or HEA)] resulted in better clinical outcomes and lower total societal costs relative to [supervised rehabilitative exercise]+HEA and HEA alone… .”
  Leininger et. al. (2016) Spine

For Neck Pain

- In a study funded by NIH's National Center for Complementary and Alternative Medicine to test the effectiveness of different approaches for treating mechanical neck pain, 272 participants were divided into three groups that received either spinal manipulative therapy (SMT) from a doctor of chiropractic (DC), pain medication (over-the-counter pain relievers, narcotics and muscle relaxants) or exercise recommendations. After 12 weeks, about 57 percent of those who met with DCs and 48 percent who exercised reported at least a 75 percent reduction in pain, compared to 33 percent of the people in the medication group. After one year, approximately 53 percent of the drug-free groups continued to report at least a 75 percent reduction in pain; compared to just 38 percent pain reduction among those who took medication.
  Bronfort et al. (2012), Annals of Internal Medicine

- In 2012, research published in the *Spine* journal analyzed the prevalence, patterns and predictors of chiropractic utilization in the U.S. general population. The researchers found that, "Back pain and neck pain were the most prevalent health problems for chiropractic consultations and the majority of users reported chiropractic helping a great deal with their health problem and improving overall health or well-being.“
- As part of the literature review, published in the March/April 2007 issue of the *Journal of Manipulative and Physiological Therapeutics*, the researchers reviewed nine previously published trials and found “high-quality evidence” that patients with chronic neck pain showed significant pain-level improvements following spinal manipulation. No trial group was reported as having remained unchanged, and all groups showed positive changes up to 12 weeks post-treatment.

Nasal specific technique as part of a chiropractic approach to chronic sinusitis and sinus headaches

D.S. Folweiler, O. T. Lynch
JMPT. Jan 1995

Objective: To demonstrate the use of nasal specific technique in conjunction with other chiropractic interventions in managing chronic head pain. CLINIC FEATURES: A 41-yr-old woman was treated for chronic sinusitis and sinus headaches. She had suffered weight loss and pain over a 2-month period.

Intervention and outcome: Chiropractic manipulation and soft tissue manipulation administered 2-6 times per month for approximately 1 yr had minimal long-term effect on the patient's head pain. When additional interventions (nasal specific technique and light force cranial adjusting) were added to the treatment regimen, significant relief of symptoms was achieved after the nasal specific technique was performed. The duration of the relief increased with successive therapeutic sessions, with minimally persistent symptoms after 2 months of therapy.

Conclusion: The nasal specific technique, when used in conjunction with other therapies, may be useful in treating chronic sinus inflammation and pain. Further investigation is needed to identify the usefulness of the nasal specific technique as an independent intervention, the use of the technique in other types of patients and presentations, and the mechanism of therapeutic benefit.

Chiropractic Care of a Patient with Vertebral Subluxation and Bell's Palsy

Joel Alcantara, DC, Gregory Plaugher, DC, Darwin L. Van Wyngarden, DC
JMPT. May 2003

OBJECTIVE: To describe the chiropractic care of a patient medically diagnosed with Bell's palsy and discuss issues clinically relevant to this disorder, such as its epidemiology, etiology, diagnosis, care, and prognosis.

CLINICAL FEATURES: A 49–year-old woman with a medical diagnosis of Bell's palsy sought chiropractic care. Her symptoms included right facial paralysis, extreme phonophobia, pain in the right temporomandibular joint (TMJ), and neck pain. Signs of cervical vertebral and TMJ subluxations included edema, tenderness, asymmetry of motion and posture, and malalignment detected from plain film radiographs.

INTERVENTION AND OUTCOME: The patient was cared for with full spine contact-specific, high-velocity, low-amplitude adjustments (Gonstead Technique) to sites of vertebral and occipital subluxations. The patient's left TMJ was also adjusted. The initial symptomatic response to care was positive, and the patient made continued improvements during the 6 months of care.

CONCLUSION: There are indications that patients suffering from Bell's palsy may benefit from a holistic chiropractic approach that not only includes a focus of examination and care of the primary regional areas of complaint (eg, face, TMJ) but also potentially from significant vertebral subluxation concomitants.

Chiropractic care of a 46-year-old woman with chronic Bell’s palsy: a case study

Brad A. Cotton
J Chiropr Med. Dec 2011

Objective: The purpose of this case study is to describe the effect of chiropractic care on a patient with chronic Bell's palsy.

Clinical Features: A 47-year-old woman with medically diagnosed Bell's palsy presented for chiropractic care. She had experienced right sinus pressure and congestion, lack of facial tone on the right, and intermittent tingling of the right side of her face.

Interventions and Outcomes: The patient received high-velocity, low-amplitude chiropractic manipulation (adjustments) to the cervical and thoracic spine, interferential muscle stimulation, and hydroculation on the trapezius muscles bilaterally. Reduction in symptoms occurred following the initial visit and continued over the next 9 weeks of care. After the course of a year of chiropractic care, the patient reached 90% improvement.

Conclusions: For this patient, chiropractic care reduced Bell's palsy symptoms

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  https://www.acatoday.org/Research/What-Research-Shows

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