Headaches, Shoulders and Feet an Osteopathic Perspective

Robert Gitlin, DO & Karla Frey-Gitlin, DO

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Acknowledgements

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Presentation Objectives

- At the conclusion of the presentation, learners will be able to:
- recognize and locate common areas of Somatic Dysfunction that cause headaches, as well as shoulder and foot issues
- utilize multiple Osteopathic Manipulative Treatments (OMT) for common disorders such as rotator cuff strain, shoulder pain, foot and heel pain, as well as musculoskeletal related headaches
- utilize their Osteopathic skills for headaches, shoulder and foot pain; knowing better when it is time to use OMT and when it is time to obtain X-rays and/or surgical consultation

Common FP complaints: HA, Shoulder, and Foot pain

- Osteopathic physicians are equipped to add more to our office visit because we apply the 4 tenets of Osteopathy:
- *The body is a unit
- *Structure and function are interrelated
- *The body has its own innate ability to heal itself
- *Rational approach applies all three of the above

Incidence of HA

- In 2018, women were nearly twice as likely as men to have had a severe headache or migraine in the past 3 months (20.1% versus 10.6%), both overall and within each age group. The percentage of persons experiencing severe headache or migraine declined with age for both men and women, from 25.5% among those aged 18–44 years to 7.6% among those aged ≥75 years for women and from 12.3% among those aged 18–44 years to 4.0% among those aged ≥75 years for men.
- **Source:** National Health Interview Survey, 2018 data. https://www.cdc.gov/nchs/nhis.htm.

Headaches- Clinical Pearls - An Osteopathic Perspective

History: HPI, Family History, Trauma, Age (Menopause/Hormones) and medication(s)

Physical Exam: HEENT, Complete Neurological exam, and an Osteopathic structural exam

The ABC's are:

AUTONOMICS

BIOMECHANICS

CIRCULATION

SCREENING

AUTONOMICS

How is the body communicating and responding to signals?

Parasympathetic Nervous System and Sympathetic Nervous System provide regulatory balance

Balance maintains homeostasis of the body

Regulates key processes without conscious effort

Targets smooth muscle of organs and sweat glands to regulate physiology

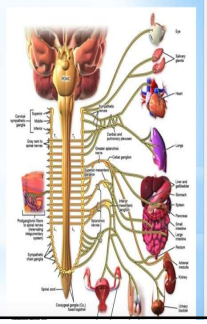
Assess and treat areas of autonomic influence

Ex: sinusitis

- Sympathetic: T1-T5
- Parasympathetic: OA, AA, C2, cranium

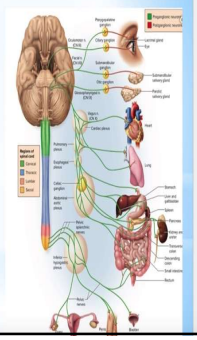
Sympathetic Nervous System

- Flight/Fight/Freeze
- T1 – L2
- Each organ has a specific thoracolumbar region that relates to sympathetic nervous system



Parasympathetics

- Rest, Digest, Heal
- Cranial
  - CN III, VII, IX, X
    - Synapse in brainstem
- Sacral
  - Splanchnic
- Synapse in lateral horn of S2-S4



75% of parasympathetic outflow is provided by the vagus nerve

Vagus Nerve

Somatic Dysfunction Autonomic Nervous System Connection

Primary Afferent Nociceptors

- Widely distributed throughout tissues of the body
- Chemical, thermal, and mechanical (proprioceptors)
- Synapse in spinal gray matter

- Through interneurons, can upregulate sympathetic efferents

B is for....
Biomechanics

How is the body biomechanically moving?

* Mechanical and structural connections throughout the body
* Restrictions in muscles, fascia, bones, joints can lead to restriction in vasculature, innervation and organ function
  * posture, injury, trauma, surgery, activity, motion, gait
* Restriction in visceral motion
* Removing the mechanical restriction leads to improved structure and thus function

"...mechanical forces applied during osteopathic manipulative treatment could lead to effects at the cellular level..."

C is for.... Circulation

How is everything flowing?

"We suffer from two causes—want of supply and the burdens of dead deposits."
- Andrew Taylor Still

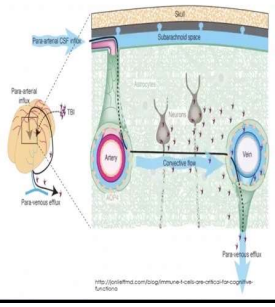
* Arterial, venous, cerebrospinal fluid, lymphatic fluid
  * Implications on oxygenation, energy, immune function

GLYMPHATIC SYSTEM

- Relatively newly discovered anatomy
- Waste disposal system for the CNS
- "Facilitates brain-wide distribution of several compounds, including glucose, lipids, amino acids, growth factors, and neuromodulators"
- Functions mainly during sleep
  - 60% increase in interstitial space and increased convective flux between CSF and interstitial fluid

GLYMPHATIC STRUCTURE

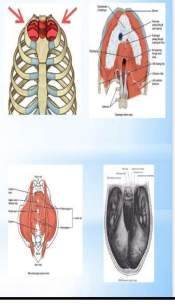
- Perivascular tunnel system (formed by astroglial cells)
- CSF ⟷ Interstitial fluid
  - CSF driven into Virchow—Robin Space → interstitial space → perivenous spaces of large veins → deep cervical lymphatic system



C is for.... Circulation

Choke points

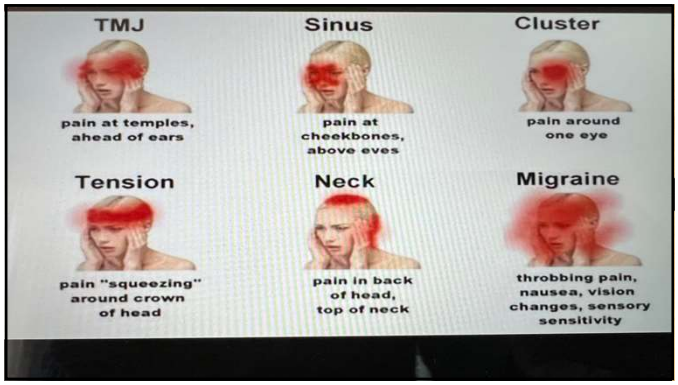
- Diaphragms
  - Thoracic inlet, thoracic diaphragm, pelvic diaphragm
- Other
  - OA, tentorium cerebelli, inguinal region,
  - Extremities: plantar fascia, popliteal fossa, antecubital fossa, axilla



S is for.... Screening

How can we look at the whole person?

- Everything is connected
- Screening exams
  - Zink Screen
  - Mitchell Model
  - Chapman's points
  - Counterstrain points
- Mind-Body-Spirit
  - Lifestyle/environment
    - nutrition, sleep, movement/exercise, healthy relationships & community, drugs, smoking, supportive family, trauma history
- Structural competency



ALL HEADACHES MAY BENEFIT FROM OMT

- RELATIVE CONTRAINDICATION(S):
- CANCER

- ABSOLUTE CONTRAINDICATION(S)
- ACUTE BLEEDS (such as AVM, CVA etc)
- ACUTE TRAUMA Related (Skull Fx etc)

Studies #1

Cureus. 2022 Aug 9;14(8):e27830.doi: 10.7759/cureus.27830. eCollection 2022 Aug. **Osteopathic Manipulative Treatment and the Management of Headaches: A Scoping Review,** Cesar E Jara Silva et al

"OMT has shown to be beneficial, especially for patients seeking alternative non-pharmaceutical and non-invasive treatments."

Osteopathic Manipulative Treatment and the Management of Headaches: A Scoping Review

"initial search yielded 473 unique articles after removing duplicates. After screening based on the inclusion and exclusion criteria, and after further analysis, 15 articles were selected. Data reports of OMT and manual therapy efficacy and/or effectiveness in treating TTH and migraine were analyzed. Articles included were randomized control studies (13 of 15, 86.6%), one pilot study (one of 15, 6.7%), and one case series (one of 15, 6.7%), which were divided into **TTH** (nine of 15, 60%) **and Migraine Headaches** (six of 15, 40%). **All articles reported significant headache improvement in at least one measurement.** Of all treatments analyzed, single technique interventions (seven of 15, 47%) and multiple technique interventions (eight of 15, 53%) were identified. Among the techniques used, Myofascial Release was the most common (nine of 15, 60%). **The articles presented provide evidence of the significant benefits of manual therapy**."

Studies #2

Complement Ther Clin Pract. 2021 May;43:101319. doi: 10.1016/j.ctcp.2021.101319. Epub 2021 Jan 24. **The comparative effects of spinal manipulation, myofascial release and exercise in tension-type headache patients with neck pain:** A randomized controlled trial, Mustafa Corum, et al

The comparative effects of spinal manipulation, myofascial release and exercise in tension-type headache patients with neck pain:

Objectives: To evaluate the effects of two manual treatment methods on pain, disability, and pressure pain threshold (PPT) in tension-type headache (TTH) patients with and neck pain.

Methods: Forty-five patients with TTH were randomly assigned to one of three groups and received eight sessions treatment: manipulation plus exercise (manipulation), suboccipital inhibition plus exercise (myofascial release), and exercise only (control). Headache frequency, pain severity (VAS-headache, VAS-neck pain) and headache and neck disability (HIT-6 and NDI, respectively) were measured at baseline, posttreatment, and at the third month follow-up. PPT was also evaluated on the temporalis muscle.

Results: Manipulation group was statistically better than myofascial release group in terms of headache frequency, headache severity, and PPT scores. Also, manipulation group showed statistically significant improvements in all outcome criteria when compared control group.

Conclusions: Manipulation and exercise, in addition to pharmacologic treatment in TTH patients with cervical dysfunction appear to be a promising approach

Studies #3

Eur J Phys Rehabil Med . 2016 Oct;52(5):606-617.

Epub 2016 Mar 18. **The effect of manipulation plus massage therapy versus massage therapy alone in people with tension-type headache. A randomized controlled clinical trial** , Gemma V Espí-López [et al]

"Although massage provided relief of headache in TTH sufferers, when combined with cervical manipulation, there was a stronger effect on range of upper cervical spine motion. "

The effect of manipulation plus massage therapy versus massage therapy alone in people with tension-type headache. A randomized controlled clinical trial

- **Population:** We enrolled **105 subjects** with TTH.
- **Methods:** Participants were divided into two groups: 1) manipulation and massage; 2) massage only (control). Four treatment sessions were applied over four weeks. The Headache Disability Inventory (HDI) and range of upper cervical and cervical motion were evaluated at baseline, immediately after the intervention and at a follow-up, 8 weeks after completing the intervention.
- **Results:** Both groups demonstrated a large (f=1.22) improvement on their HDI scores. Those that received manipulation reported a medium-sized reduction (f=0.33) in headache frequency across all data points (P<0.05) compared to the control group. Both groups showed a large within-subject effect for upper cervical extension (f=0.62), a medium-sized effect for cervical extension (f=0.39), and large effects for upper cervical (f=1.00) and cervical (f=0.27) flexion. The addition of manipulation resulted in larger gains of upper cervical flexion range of motion, and this difference remained stable at the follow-up.
- **Conclusions:** These findings support the benefit of treating TTH with either massage or massage combined with a manipulative technique. However, the **addition of manipulative technique was more effective for increasing range of motion of the upper cervical spine and for reducing the impact of headache.**

- Cerritelli, F. et all. Osteopathy for primary headache patients: a systematic review. *J Pain Res* 2017;10:601-611
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5359118/
  - The results from this systematic review **show a preliminary low level of evidence that OMT is effective in the management of headache.** However, studies with more rigorous designs and methodology are needed to strengthen this evidence.

- Voigt K, Liebnitzky J, Burmeister Uet al. Efficacy of osteopathic manipulative treatment of female patients with migraine: results of a randomized controlled trial. *J Altern Complement Med*. 2011;*17*(3):225-230.
  - https://www.ncbi.nlm.nih.gov/pubmed/21385086
  - This study affirms the effects of OMT on **migraine headache in regard to decreased pain intensity and the reduction of number of days with migraine as well as working disability**, and partly on improvement of HRQoL. Future studies with a larger sample size should reproduce the results with a control group receiving placebo treatment in a long-term follow-up.

- Garcia J, Arnold S, Tetley K, Voight K, Frank RA. Mobilization and manipulation of the cervical spine in patients with cervicogenic headache: any scientific evidence? *Front Neurol*. 2016;7:40. doi:10.3389/fneur.2016.00040
  - https://www.ncbi.nlm.nih.gov/pubmed/27047446
  - Seven of the 10 studies had statistically significant findings that subjects who received mobilization or manipulation interventions experienced improved outcomes or reported fewer symptoms than control subjects. These results suggest that **mobilization or manipulation of the cervical spine may be beneficial for individuals who suffer from cervicogenic headache**, although heterogeneity of the studies makes it difficult to generalize the findings.

- Schabert,E. et al Impact of osteopathic manipulative treatment on cost of care for patients with migraine headache: a retrospective review of patient records. JAOA. 2009;8(109):403-407
  - http://jaoa.org/article.aspx?articleid=2093824&resultClick=1
  - The inclusion of **OMT in a treatment regimen for patients with migraine headache may lower the cost of the treatment regimen**. However, further study is needed to confirm these

Differential Dx for HAs:

- Migraines: Hx-hereditary, N/V, photophobia, young, worse with hormones?
- Cervicogenic/ musculoskeletal, TMJ, CHI, CCI
- Tension type (TTH)
- Infectious- Sinusitis-facial pain, nasal congestion, Lyme- Babesia, Bartonella, Mold, MCAS etc
- Cluster HAs- eye tearing more common with men
- AVM's , CA- Tumor-space occupying lesion

Red flags for a headache:

- Worsening pattern(increase frequency ,increase severity)
- Age >50
- New onset/Sudden onset HA with underlying disease (CA, lyme, HTN, etc)
- HA with concomitant systemic illness(fever, neck stiffness-Meningitis etc, cutaneous rash)
- HA triggered by cough, exertion, valsalva

Red flags for a headache cont'd

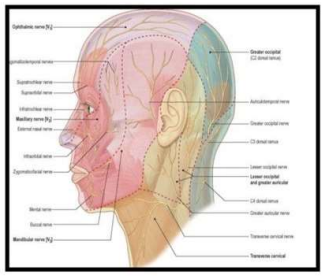
- Focal neurologic s/s
- Papilledema
- HA secondary to trauma
- HA during pregnancy or post-partum
- Prolonged or bizarre aura

Always do a complete Neuro Exam

- Aneurysm
- Bud-Chiari malformation
- Meningitis
- Pseudotumor cerebri-middle age women
- Temporal arteritis
- MS

What causes the pain of a headache? The brain itself does not have nociceptive fibers- so when there is a headache it is due to nociception of other structures in the head with nociceptive input:

- **Extracranially**:
  - Scalp
  - Arteries
  - Muscle
  - Mucous membranes
  - external auditory meatus
  - Teeth
- **Intracranially**:
  - Meninges
  - Venous sinuses
  - Arteries
- **Other structures** innervated by C1, C2, C3 can also contribute to headache pain either through innervation or referral patterns
  - Suboccipital muscles
  - Muscles of the neck
  - Zygapophysial joints of C2-C4
  - OA (C1) and AA (C2)
  - Dura of the spinal cord, posterior fossa, and inferior surface of the tentorium cerebelli
  - Vertebral artery

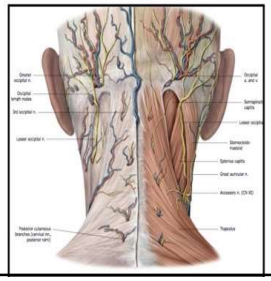


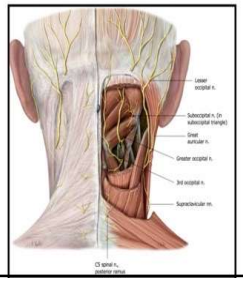
Only 3 important things to know

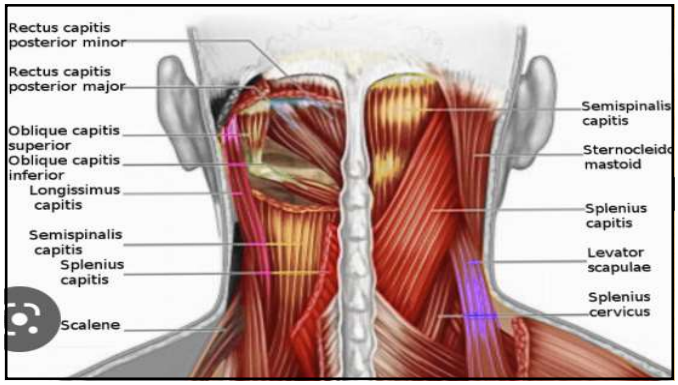
Anatomy,Anatomy, Anatomy…

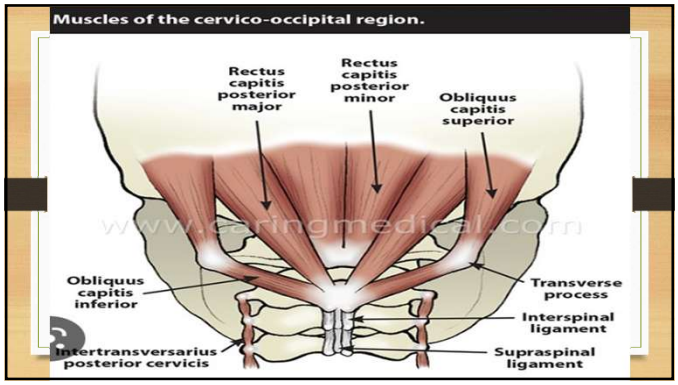
A.T. Still, MD, DO

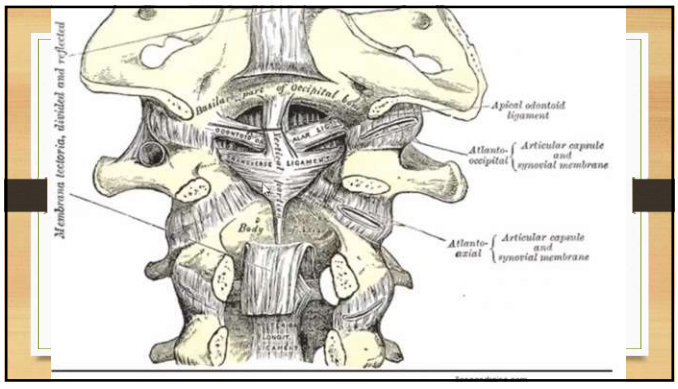
- ***Suboccipital n. C1*** - Motor innervation to suboccipital muscles: rectus capitis posterior major, rectus capitis posterior major, obliquus capitis superior and obliquus capitis inferior. C1 has no cutaneous nerve branches.
- ***Greater occipital n. C2*** - Sensory to the posterior head. Motor to posterior neck musculature: splenius capitis, semispinalis capitis. The greater occipital nerve passes directly through the semispinalis capitis muscle.
- ***3rd occipital n. C3*** - Provides sensory innervation to the posterior neck and lower part of the head.

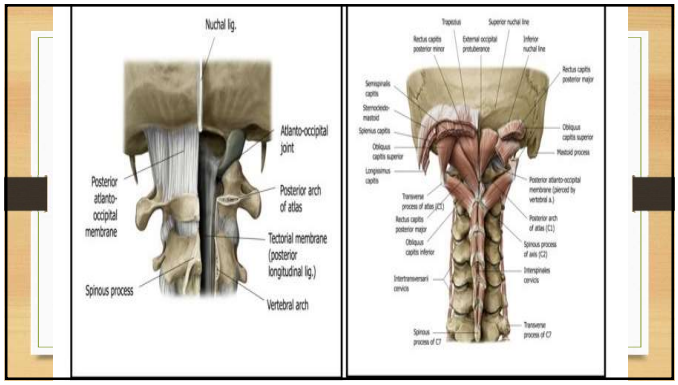


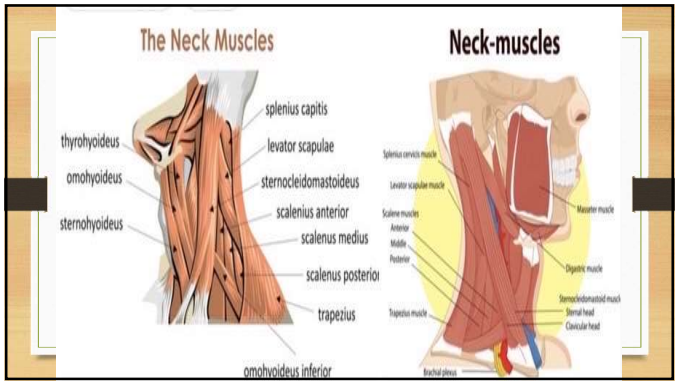



Rectus capitis posterior minor
Rectus capitis posterior major
Oblique capitis superior
Oblique capitis inferior
Longissimus capitis
Semispinalis capitis
Splenius capitis
Scalene
Semispinalis capitis
Sternocleido mastoid
Splenius capitis
Levator scapulae
Splenius cervicus


Muscles of the cervico-occipital region.
Rectus capitis posterior major
Rectus capitis posterior minor
Obliquus capitis superior
Obliquus capitis inferior
Transverse process
Interspinal ligament
Intertransversarius posterior cervicis
Supraspinal ligament

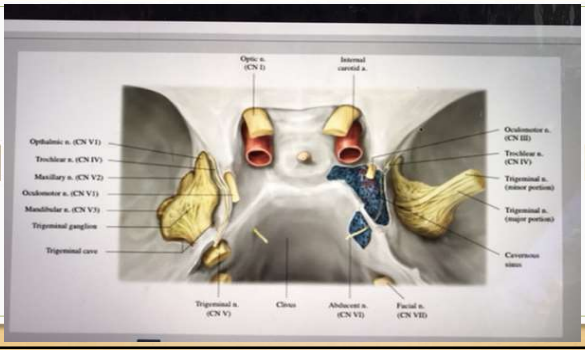

Membrana tectoria, divided and reflected
Apical odontoid ligament
Atlanto-occipital
Articular capsule and synovial membrane
Body
Atlanto-axial
Articular capsule and synovial membrane





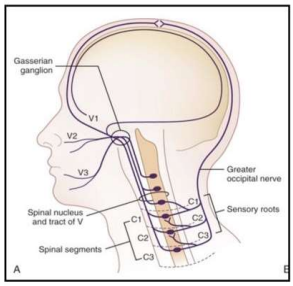
Sella tursica

- Mid cranial base
- Houses pituitary gland
- Trigeminal ganglia resides in Meckel's cave(near apex of petrous portion of temporal bone). Meckel's cave is a cavity in the dura mater that is part of an evagination of tentorium cerebelli(which envelopes the trigeminal ganglion and provides a 3 finger like membranous glove for CN V rootlets).



Trigeminocervical Nucleus - Integration

The trigeminal nerve in the brain stem extends and becomes continuous with the grey matter of the spinal cord, becoming the trigeminocervical nucleus. The nucleus receives afferent fibers from not only the trigeminal nerve, but from fibers of the VII, IX, and X cranial nerves. This ramification extends to the 3rd or fourth cervical segment of the spinal cord. The significance of this nucleus is that all nociceptive afferent fibers to the head and neck exist in the specific area and have overlapping patterns of innervation with each other. This creates the basis for referred pain in the head and neck. For example, pain in the head (CN V) can be referred back to a cervical or other cranial nerve segment resulting in pain in a different receptive field, or both fields.

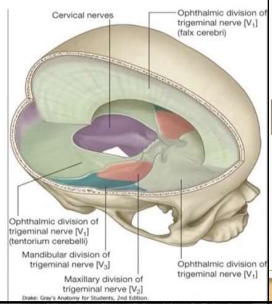


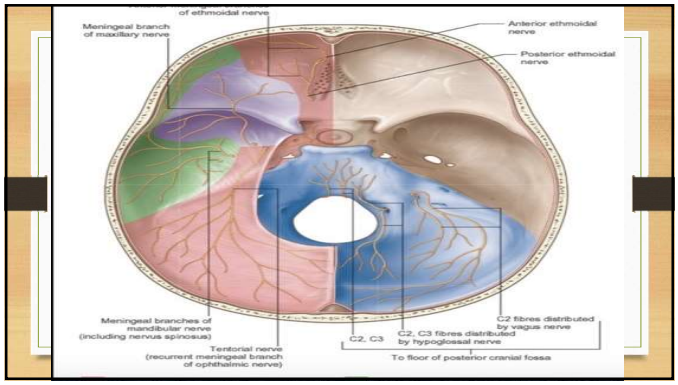
Myodural Bridge (complex)

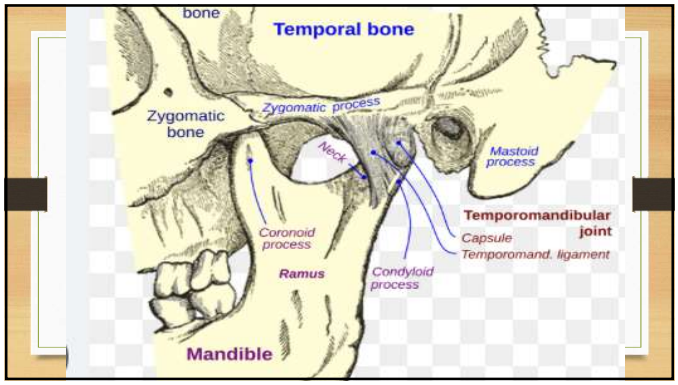
The OA membrane attaches to foramen magnum superiorly and to the posterior arch of C1 inferiorly and blends with the underlying dura mater. The dura mater is firmly attached to the upper 3 cervical segments, then more loosely attached within the spinal canal until S2 where it is again firmly attached by the filum terminale externum. Portions of the rectus capitis posterior minor muscle have a direct connection to the OA membrane, which consequently has connections to the spinal dura creating a connective tissue complex. These anatomic connections could exhibit how structural dysfunction in the [illegible]

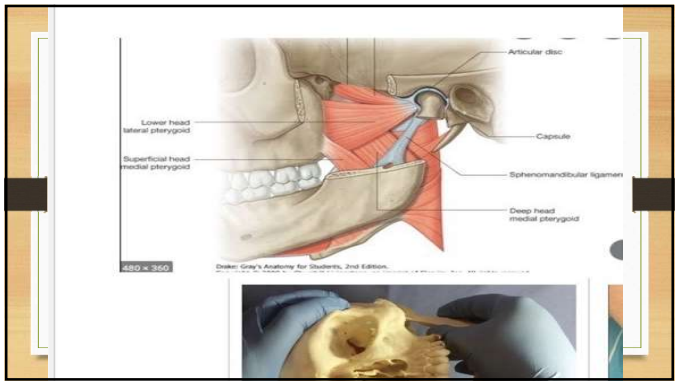
INNERVATION OF DURA

- No true pain fibers in brain parenchyma
- Meningeal pain fibers
  - Anterior and middle cranial fossa from CN5
  - Posterior cranial fossa: C1-3 via CN9 &10




of ethmoidal nerve
Meningeal branch of maxillary nerve
Anterior ethmoidal nerve
Posterior ethmoidal nerve
Meningeal branches of mandibular nerve (including nervus spinosus)
Tentorial nerve (recurrent meningeal branch of ophthalmic nerve)
C2, C3
C2, C3 fibres distributed by hypoglossal nerve
C2 fibres distributed by vagus nerve
To floor of posterior cranial fossa


bone
Temporal bone
Zygomatic bone
Zygomatic process
Neck
Mastoid process
Temporomandibular joint
Capsule
Temporomand. ligament
Coronoid process
Ramus
Condyloid process
Mandible


Articular disc
Lower head lateral pterygoid
Capsule
Superficial head medial pterygoid
Sphenomandibular ligamen
Deep head medial pterygoid
480 × 360

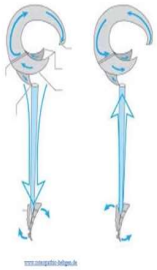
Anatomical Attachments throughout the body matter

- "If your buns are not on right, your head is not on right" Richard Koss, DO
- Always be mindful of sacral Somatic Dysfunction in your History and Physical Examination for HA (fell on tail bone...)

OTHER THOUGHTS ON DURA

- These attachments outside of the head, help explain why the trauma to the head may lead to pain elsewhere in the body
  - Neck pain
  - Back pain
  - Sacral/pelvic pain
  - And ultimately further impaired functioning

EXTRADURAL DURAL MEMBRANES (CORE LINK)



Case 1

- 22 YO WM presents with 2 year h/o getting hit over the head with a 50 foot long pole that fell directly onto his head while pitching in College.
- Severe CHI symptoms of memory loss, poor cognition, slow speech, chronic unremitting 9/10 "blinding HA's", all scans normal
- Needed to quit school, lost scholarship, dreams of major league baseball gone
- Depressed, Severe Anxiety, at home with parents, very limited life, stays in a dark room laying around mostly.

Case #1 continued

- Osteopathic Assessment reveals severe SBS compression underlying a Right SBR, sacral shear, abdominal diaphragm/linea alba MFS, compressed C-spine and Hyoid elevated/tender on the right side. Nutritional supplements: Lion's mane, Bocoba, Phos Serine Complex, Citocholine etc...
- First OMT visit- focused on sacral and cranial aspects using intraoral SBS decompression/C-O Decompression/VST- tremendous "immediate relief", like a "big aha moment"
- Second session- HA's greatly reduced to only 2 since prior visit. Brain starting to feel less foggy. OMT to diaphragm and sacral/cranial balancing along with hyoid release and C-O Decompression/VST- "feel balanced and light"

Case #1 continued

- Follow-up a week later. No HA, (ANX/DPN less), Brain clearer then it has been in years
- OMT 2 weeks later- No HA's, No ANX, DPN has lifted, Starting to exercise for the first time in years, looking into going back to college
- 6 weeks later- Back at College

Case #2

- 19 YO WM- professional Race car driver

Case #3

- 22 YO WM presents with 5 year H/O HA ever since a deer ran into tent directly into head--> immediate HA's, neck pain--> completely neg films
- Inspected, Detected and Rejected
- Lays around parent's home all day, severe DPN, ANX, 10/10 HA's, blunted flat affect for 'years', cannot exercise at all (Used to high performance athelete
- Thinks that he needs to go the a CCI center for TX, read about it on line and is sure that he has all of the SX of it.
- Osteopathic HX very revealing for trauma induced CHI (Pt never hear of it)

Case #3 continued

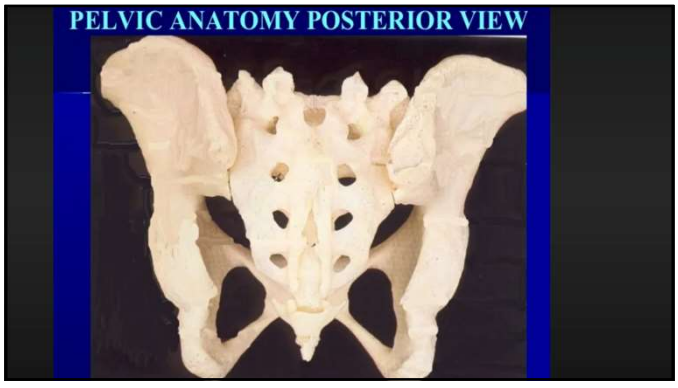
- CCI- not noted on PE, but Severe SBS compression with worst Right SBR I have ever seen, linea alba tight, ABD diaphragm spasm, NO breath movement- ribs stuck, sacrum locked up-no motion, Hyoid high on right and tender, sub-occiput
- First OMT session- focused on getting the cranial and sacral areas moving--> immediate relief, incredulous
- Reassessment--> "I'm no better at all", "I do not think this is helping at all"

Case #3 continued

- 2nd OMT--> (Similar to previous cases) "I cannot believe it, I feel so much better, HA is gone, I can breath for the first time in years"
- 3rd OMT visit- "No better", can clearly see he is breathing better, doing breathing exercises intermittantly, "felt so good" went out drinking with friends one night. Stressed importance of compliance with TX plan
- **Teaching point:** NO ALCOHOL for CHI patients!!!
- 4th OMT- "No better", went on a 2 week bender with ETOH and friends, admits HA and brain a "a little improved"

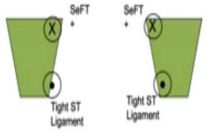
Case #3 continued

- The patient unable to travel 4 hours round trip to see us anymore
- Asks for 'local' referral, only an hour away
- Referring Doctor contacts us to tell us that he was actually 80% after seeing us and getting little if any strides with new team
- **Teachable moment-** stay in your integrity with pt- be willing to say goodbye, trust your hands and senses about the pt, be willing to plant the seeds of health: "What are you going to do when you are better?"



UNILATERAL SACRAL FLEXION CONSIDERATIONS

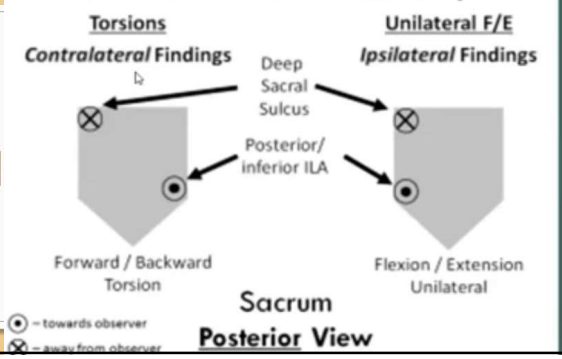
- Either Right or Left
- Deep sacral sulcus ipsilateral to posterior/inferior ILA
- (+) SeFT ipsilateral to the deep sacral sulcus
- L_5 rotated ipsilateral to deep sacral sulcus
- Sacrotuberous ligament increased tension ipsilateral to the post/inferior ILA
- (-) Sphinx test: findings get better
- (-) Lumbar Spring Test – springs nicely
- L/S Inhalation Respiratory Test : findings get more asymmetric



$L_5 R_R$ Right

$L_5 R_L$ Left

SI – Torsions vs. Unilateral F/E



Osteopathic Treatment Modalities Reviewed

- Direct- Muscle Energy, HVLA, Myofascial Release (MFR)
- Indirect- Strain-Counterstrain, Myofascial Release (MFR), BLT (Balanced Ligamentous Tension), Osteopathy in the Cranial Field

Muscle Energy Technique (MET) Treatment Sequence:

1. Make an accurate structural diagnosis.
2. Position the bone, joint, or body part by engaging the "feather edge" of the restrictive barrier in all available planes.
3. Instruct the patient to contract against your unyielding counterforce. Explain the direction of effort (away from restrictive barrier), the intensity of the contraction (ounces to pounds, more muscle mass requires more force) and the duration of the contraction (5 seconds) clearly to your patient.
4. Instruct the patient to slowly and completely cease the contraction. The Student Doctor relaxes simultaneously.
5. Pause 3 seconds to insure full relaxation by the patient
6. Reposition the body part to the new restrictive barrier, "feather edge", by "taking up the slack" in all available planes of motion..
7. Repeat steps 1-6 until maximum therapeutic response is achieved, usually 3-5 times (typically peaks at 3).
8. Apply a final stretch in the direction of the restrictive barrier and then passively return the patient to a stable neutral position.
9. Reevaluate the original structural diagnosis and response to treatment.

Osteopathic treatment descriptions/definitions:

1) SCS-strain counterstrain: a passive indirect technique in which tissue is positioned at a point of balance, or ease, away from the restricted barrier.

*History: developed by Larry Jones, D.O, who discovered multiple tenderpoints on the body, found treatment positions to relieve TPs.
-the tenderpoints are located in the myofascial, tendons, ligaments, and belly of the muscles. They can be tense and somewhat edematous areas of tissue the size of fingertip
--one or more TPs may be associated with SD (Jones thought that a CS point was a manifestation of a SD)
--located in specific areas of body
--located in muscles, tendons, ligaments, fascia
-the TPs do not radiate or refer pain elsewhere(as with Janet Travell's triggerpoint model)
*treatment modality uses the concept that by placing the body into position of maximum comfort, this can relieve and "shut-off' the tender point
*Based on the idea: rapid shortening, then lengthening of the antagonistic to the muscle strained.
-produces an inappropriate reflex, like a muscle strain even though there is no strain(called a strain reflex)
-the rapid shortening then lengthening of the antagonist m. produces an inappropriate reflex.
-TX: involves shortening the muscle (with the TP) being treated to decrease proprioceptive firing

Counterstrain Point Characteristics

- Palpated as tense, somewhat edematous areas of tissue about the size of a fingertip
- Exquisitely tender (about 4X normal) locally to an amount of pressure that normally would not elicit tenderness
- One or more associated with a specific somatic dysfunction

Basic Treatment Sequence

1. Identify a significant counterstrain point
2. Establish a tenderness scale
3. Monitor and retest throughout
4. Position to eliminate tenderness
5. Maintain position for 90 seconds
6. Slowly return patient to starting position
7. Recheck counterstrain point

3) MFR: direct or indirect fascial release technique which engages continual palpatory feedback to achieve release of myofascial tissues. DX and TX described by AT Still
-direct: stack barriers of fascial restriction. Tissue loaded with constant force until tissue release. "Stacking ROM"
-indirect: stack motions of fascial ease
*Application: treat SD in connective tissue of the body, specifically fascia, muscles, and related structures
-find restrictions/ease and stack in each motion
-apply compression (usually indirect) or traction(usually direct)
-add twisting or transverse forces
-use enhancers, like the breath
-hold for release

3) Articulatory technique:
*springing, direct
*D.O. gently and repetitively forces part of a body being treated against restrictive barrier (generally maintained by tight muscles and Connective tissues)
*Sometimes called long lever technique

4) ME technique (muscle energy): developed by Fred Mitchell,Sr., D.O
*The principle of ME is a procedure to lengthen shortened or hypertonic muscle or fascia by using pt.'s contracting force against D.O.'s resistance. Pt's muscles are actively used on request from a precisely controlled position in a specific direction and against a distinctly executed physician counterforce
-TX involves taking SD of body to the "feather's edge" of the barrier, holding and have pt. produce a force against D.O. and do this several times
*Different kinds of ME: joint mobilization, post-isometric relaxation
-used for SDs of restricted joints, fibrosis/adhesions

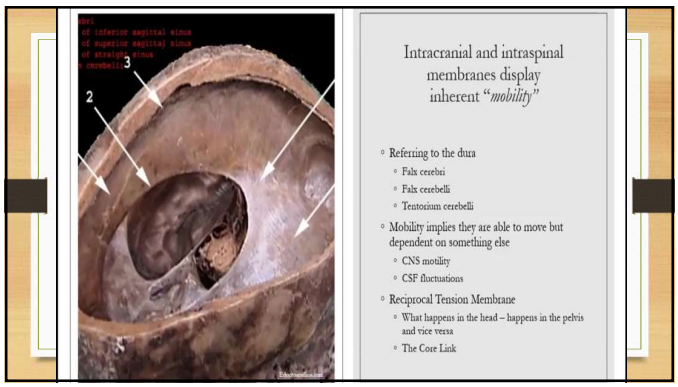
2) BLT: Balanced ligamentous tension (or LAS-ligamentous articular strains): according to Sutherland's model, the joints in the body are balanced ligamentous articular mechanisms. The ligaments provide proprioceptive information that guides the muscle response for positioning the joint and the ligaments themselves guide the motion of the articular components
-normally, ligaments of a functioning joint exist in a balanced, reciprocal tension and a disruption of that balance can cause and/or maintain SD.
-when a ligament is strained (by injury, Inflammation or mechanical forces), the distribution of tension affecting that joint becomes altered.
*BLT is a kind of Myofascial release technique that looks at balancing ligamentous attachment to an area: either indirect emphasis or direct emphasis.
-involves holding/guiding equal tension between fascial connections of ligaments.
-The technique involves: positioning the joint so that forces in the ligaments of the joint once again become balanced. The joint is moved in the direction of the strained ligaments until tension within those ligaments become equal to those which are not strained. Balanced tension is achieved by using compression and/or distraction with respiratory assistance (can also facilitate release.) Hold this balance until feel release.

5) OCMM: Osteopathic Cranial Manipulative Medicine
- *DX and TX using PRM (primary respiratory mechanism) and BMT (balanced membranous tension)
- *5 components of the PRM
  - -inherent motility of the brain and spinal cord
  - -rthymic fluctuations of the CSF
  - -the motion of the intracranial and intraspinal (Dural) membranes
  - -the articular mobility of the bones of the cranium
  - -the articular mobility of the sacrum between the ilia
- *TX for cranial SD
  - -BMT
  - -exaggeration: addressing SBS strain patterns
  - -directing fluid (THE TIDE), directing fluctuant fluid forces through gentle pressure on cranium and/or other structures
  - -direct/molding-applied direct forces typically to cranial vault structures
  - -Disengagement (articular/suture release)-specific decompressive forces applied to sutural restrictions (often used with fluid as noted)

"BEVELED LIKE THE GILLS OF A FISH"
DR. W.G. SUTHERLAND, DO
KIRKSVILLE, MO. CIRCA 1898

The Five (5) Component Phenomena of the *Primary Respiratory Mechanism*

1) Central nervous system exhibits (CNS) inherent "*motility* "(CNS parenchyma)
2) Cerebral spinal fluid (CSF) exhibits rhythmic "*fluctuations*"
3) Intracranial and intraspinal membranes (dura) display inherent "*mobility*"
4) Osseous cranial bones exhibit articular "*mobility*"
5) Sacrum articular "*mobility*" exists relative to ilia



Intracranial and intraspinal membranes display inherent "*mobility*"

- Referring to the dura
  - Falx cerebri
  - Falx cerebelli
  - Tentorium cerebelli
- Mobility implies they are able to move but dependent on something else
  - CNS motility
  - CSF fluctuations
- Reciprocal Tension Membrane
  - What happens in the head – happens in the pelvis and vice versa
  - The Core Link

Principles of soft tissue technique:

1. Instruct the patient to position themselves comfortably on the table (seated, prone, lateral recumbent, supine, etc.)
2. Sit /stand in a manner that maximizes your ability to contact the part of the patient to be treated and that minimizes your postural stress
3. Apply the minimum force needed to contact the tissue being treated and not cause pain
4. Apply force in the correct vector for the technique
5. Sustain or alter the force until the desired effect is achieved
6. Reduce the force to allow the process to begin anew (when appropriate)
7. Repeat the process in a rhythmic fashion until the desired effect is obtained (when appropriate)

PEARLS: 1) Pay attention to the FEEL of the tissue. That's it!

Suboccipital Release / Inhibition

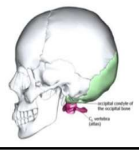
1. Patient is supine. Doctor is seated at the head of the bed/table.
2. Doctor places finger pads just inferior to the patient's superior nuchal line in the suboccipital muscles.
3. Lift weight of head onto your fingers making sure to maintain the curve of the joints of your fingers. The head should be off of your palms.
4. Using their forearms as a fulcrum the doctor adds a small amount of cephalad traction by leaning back.
5. Wait for relaxation of the suboccipital muscles and settling of the head into your palms.
6. Reassess tissue tension

Techniques

Condylar decompression

1. The patient will lie supine on the table and physician seated at head of table with forearms resting comfortably on the table. Resting the patient's head on the physician's palms with the index and middle fingers curling around the occiput to contact the patient's condylar processes, attempting to conta ct as closely to the condyles as the soft tissue and C1 will allow.
2. Apply a balanced bony matrix contact and then induce posterior-lateral intraosseous tension through approximating the physician's wrists and gently leaning back.
3. While maintaining the above tension, synchronously apply a bilateral posterior lateral forced to withdraw the condyles out from C1 until bilateral balanced tension is appreciated.
4. Maintain until the bilateral condylar region softens and a slight spreading release is perceived at the condyles as they back out from the C1 facets.
5. Then reassess your patient.





a. Supine LS Decompression
   i. For this technique, the patient will be prone and the physician will be standing at the side of the table facing the patient.
   ii. Assess the lumbosacral junction with light springing over the junction.
   iii. The cephalad arm will conform to the patient's sacrum so that the hand is centered on the sacrum while the caudad hand will cross it to contact the lumbar spine.
   iv. Once you have your hands contacting the lumbar spine and the sacrum, position the sacrum and the lumbar spine in slight traction by putting gentle pressure in opposite directions.
   v. Then add lumbosacral decompression by adding inferior traction and or superior traction at the lumbar sacral junction to decompress that joint.
   vi. Once you have created a sense of increased space at the lumbosacral junction, you may note a release or an increase of amplitude of the PRM.
   vii. Once you have appreciated this release, relax your hands and allow tensions to return to neutral and reassess your patient.

Supine Bilateral Flexion Stretch of Cervical Spine

1. SD arms are crossed behind patient's head and neck with hands resting on anterior aspect of patient's shoulders
2. Gently lift arms to flex cervical spine and engage cervical muscle tissue tension
3. Wait for release and repeat as indicated
4. SD may use one arm to roll patient's head and neck to either side to address unilateral cervical paravertebral muscle tissue tension
5. Gently and slowly release tension and return head to table and reassess

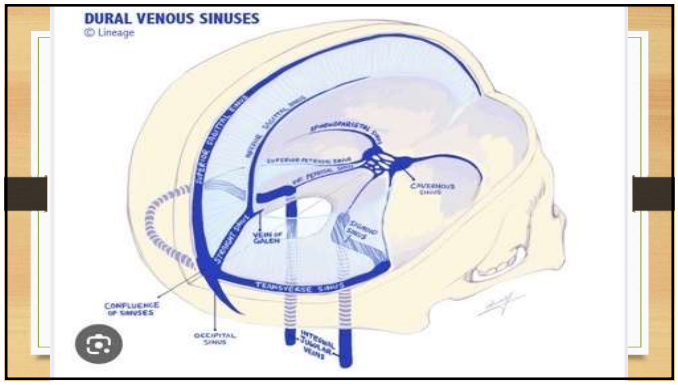
A powerful stretch: ease into it!

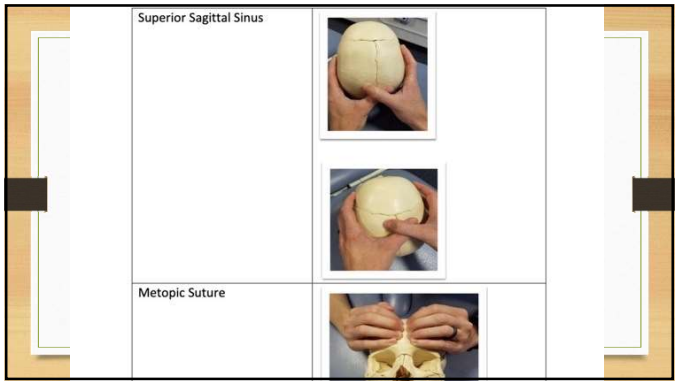
"Cervical Push-Pull" stretch

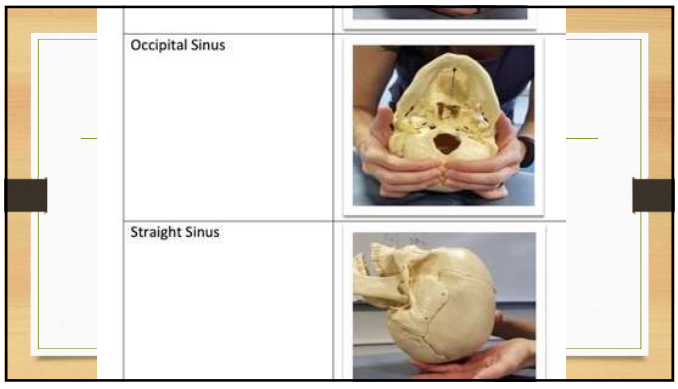
Standing on the contralateral side of a supine patient:
1. Caudal hand of SD contacts and engages contralateral cervical paravertebral muscle by lifting anteriorly while the
2. Cephalad hand rests gently on patient's forehead and rolls the patients forehead away meeting and matching the tension created by the caudal hand's kneading motion
3. Move rhythmically superior and inferior to relax tissues
4. Reassess

*Supine Unilateral Stretch of Cervical Spine

Standing at head of supine patient:
1. SD ipsilateral hand gently engages cervical tissues by pushing patient's shoulder caudally.
2. SD cephalad hand gently engages cervical tissues by lifting head and neck anteriorly and to side opposite of the stabilized shoulder balancing tensions and waiting for release.
3. May relax tension and repeat as necessary.
4. Reassess
5. Variation is to use contralateral hand to stabilize shoulder and engage cervical tissues while using cephalad hand to gently engage cervical tissues by lifting head and neck anteriorly and to side opposite of the stabilized shoulder balancing tensions and waiting for release.


DURAL VENOUS SINUSES
© Lineage
CAVERNOUS SINUS
VEIN OF GALEN
CONFLUENCE OF SINUSES
OCCIPITAL SINUS


Superior Sagittal Sinus
Metopic Suture


Occipital Sinus
Straight Sinus