




**An Overview of Temporal Bone and Fascia Influence on Anterior Neck Pattern Function and Airway Restriction**

by Ron Hruska, MPA, PT

**COLLABORATION CURES**  

October 17-19, 2019  
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The temporal bones are paired, and externally and internally rotate in a rhythmic cycle as the head, spine and entire body go through cyclic flexion and extension.

The word 'temporal' relates to worldly, secular and time. The spatial dimensions of human interferences in a complex ecosystem, relate to 'temporal'.

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**TEMPORAL ROTATION**

**EXTERNAL ROTATION**

- ❖ Flexion
- ❖ Anterior Rotation of Temporal and Sphenoid
- ❖ Inhalation

**INTERNAL ROTATION**

- ❖ Extension
- ❖ Posterior Rotation of Temporal and Sphenoid
- ❖ Exhalation

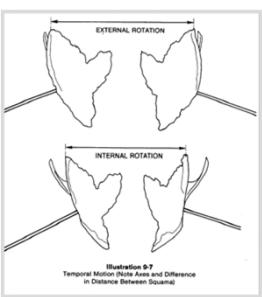


Illustration 9-7  
Temporal Motion: Right Axis and Difference in Distance Between Squamae

Upledger JE, Vredevoogd JD. Craniosacral Therapy. Eastland Press, Seattle 1983.

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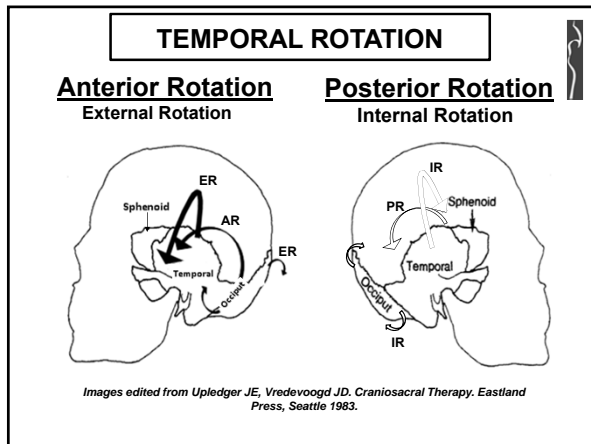
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**When one of the temporal bones is unable to cycle from one phase of flexion, or extension through its reciprocal movement, a restricted movement pattern usually develops.**

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**The most common position of temporal restriction is internal rotation, which can occur on one or both sides of the sphenoid.**

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**TEMPORAL INTERNAL ROTATION**

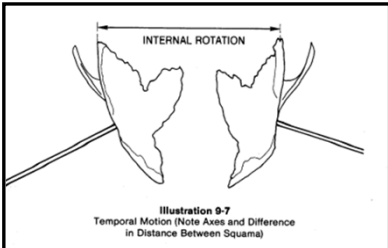


Illustration 9-7  
Temporal Motion (Note Axes and Difference  
in Distance Between Squamae)

Upledger JE, Vredevoogd JD. *Craniosacral Therapy*. Eastland Press, Seattle 1983.

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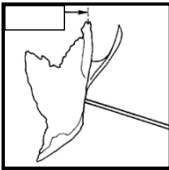
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<p><b>Left Temporal ER</b></p>  <p><b>External Rotation</b></p> <ul style="list-style-type: none"> <li>• Flexion</li> <li>• Anterior Rotation of Temporal &amp; Sphenoid</li> <li>• Inhalation</li> <li>• TMJ capsule moves posteromedial</li> </ul>	<p><b>Right Temporal IR</b></p>  <p><b>Internal Rotation</b></p> <ul style="list-style-type: none"> <li>• Extension</li> <li>• Posterior Rotation of Temporal &amp; Sphenoid</li> <li>• Exhalation</li> <li>• TMJ capsule moves anterolateral</li> </ul>
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**Bilateral external rotation restriction of the temporal bones is rare.**

**Restricted internal rotation occurs more frequently, primarily because of forward occipital on atlas movement, i.e. class II malocclusion, myopia, apnea, overactive anterior neck muscle and anterior neck fascial restriction.**

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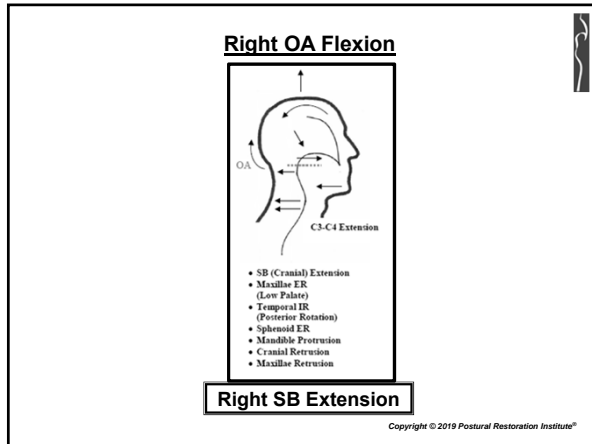
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The paired or peripheral bones internally rotate during this process of cranial extension. The posterior rotating temporal bones move the TMJ's anteriorly and assist in protraction (FHP) of the entire cranial, cervical, and upper thorax complex during this 'phase of cranial exhalation'.

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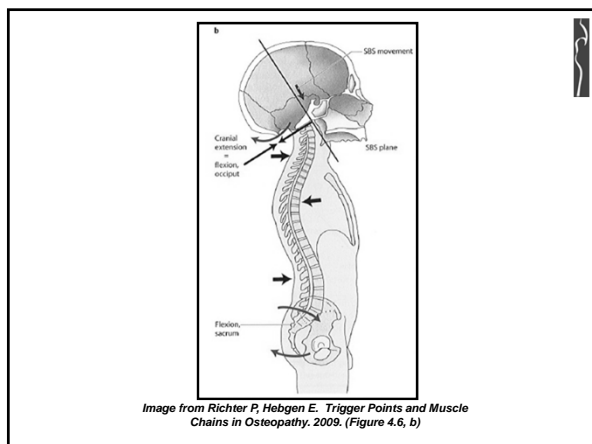
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The most common clinical problems involving temporal bone dysfunction and restriction relate to hearing, balance, pain and vagotonia. In addition, because the motor nerves to the eye pass between the layers of the tentorium cerebelli, the tension of these membranes and surrounding fascia is influenced by temporal movement, or lack of.

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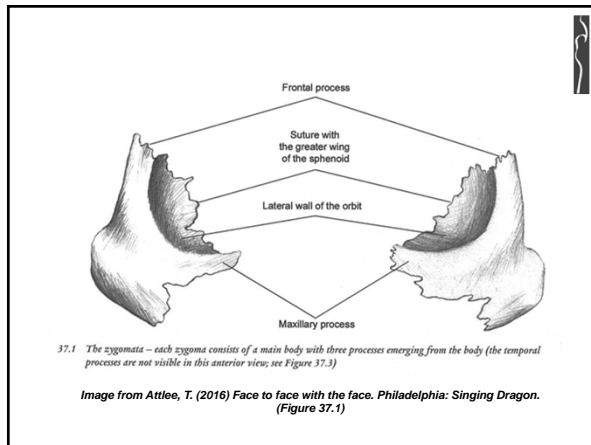
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Temporal bone reciprocal rotational movement, provided by alternating occipital atlanto and temporal mandibular joint compression and decompression, is permitted when soft tissue restriction and patterned muscle integration is normalized and balanced.

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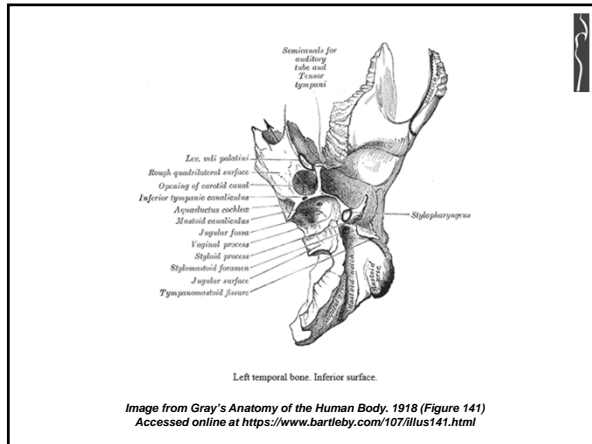
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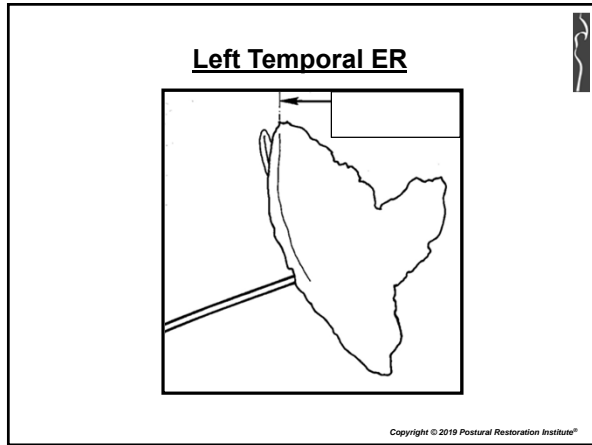
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**Fixed internal rotation of one or both temporal bones maintains partial or complete closure of the eustachian tube, accompanied by high pitch noises.**

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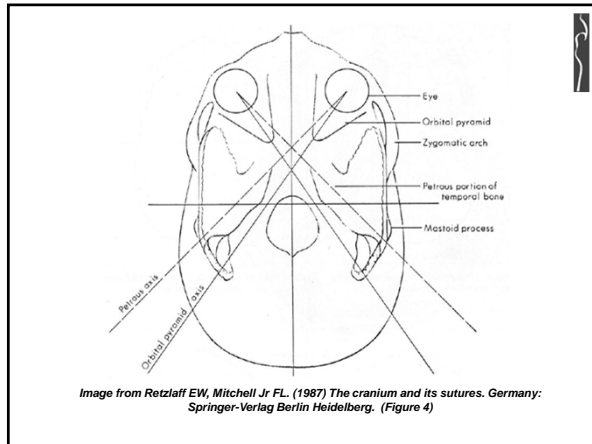
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The hyoid bone may also be pulled up superiorly and back on the side of the internally rotated temporal bone, because of slack in the stylohyoid ligament and muscle secondary to forward head positioning.

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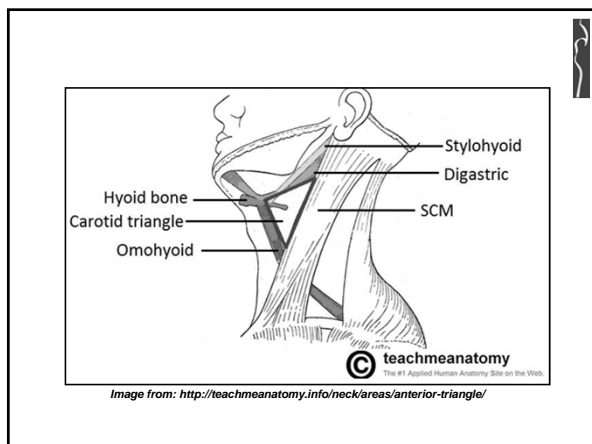
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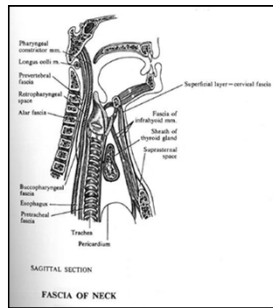
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Over time, the first two ribs rotate up and the shortening of the infrahyoid fascia, subclavius and platysma muscle pulls the hyoid back and down.



Used with permission: Review of gross anatomy 6th Edition, Pansky B.

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Therefore, temporal bone external rotation immobility reduces proper swallowing, vocal cord resonance, and airway function.

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In addition to temporal bone internal rotation related influence, impingement on neurologic physiology, and internal cranial diminished 'space', the ligaments, muscle and fascia around and below the glenoid fossa of the TMJ become tight and restricted in flexibility.

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**Anterior temporalis tension, which is often associated with clenching, grinding and bruxing, is high because of the subconscious desire to externally and anteriorly rotate the temporal bone through mandibular elevation.**



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**Spasm of the temporalis muscle will provide a powerful downward and anterior force on the squama when posterior teeth occlude. This force is generated to release or re-tense the internally rotated temporal bone through external rotation effort.**

**Humans clench to re-tense the temporal bone soft tissue and to reduce the tension created on the tentorium cerebelli by the restricted temporal bone.**



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**Balancing the movement of the temporal bones requires ongoing re-tension of the soft tissue at the hyoid (stylohyoid and styloglossus muscles), occipital-atlanto joints and TMJ's around the external ear canal, through unrestricted alternating lateralized movement of the head, neck, and arms.**



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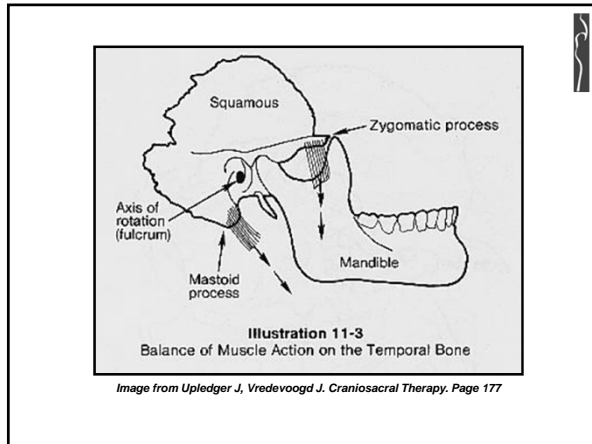
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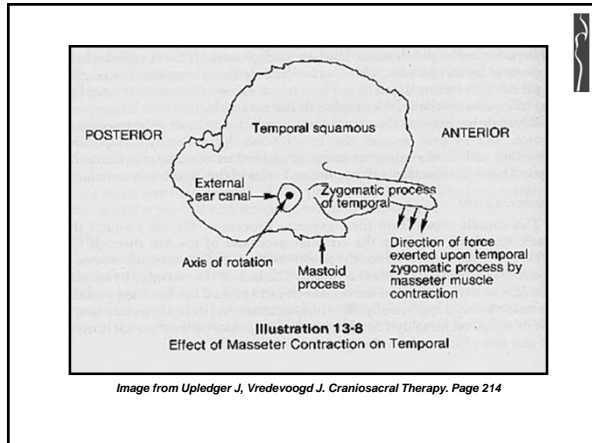
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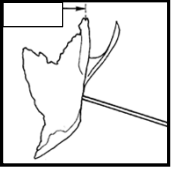
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### Most Common Pattern of Temporal Bone Position

<p><b>Left Temporal ER</b></p>  <p><b>External Rotation</b></p> <ul style="list-style-type: none"> <li>• Flexion</li> <li>• Anterior Rotation of Temporal &amp; Sphenoid</li> <li>• Inhalation</li> <li>• TMJ capsule moves posteromedial</li> </ul>	<p><b>Right Temporal IR</b></p>  <p><b>Internal Rotation</b></p> <ul style="list-style-type: none"> <li>• Extension</li> <li>• Posterior Rotation of Temporal &amp; Sphenoid</li> <li>• Exhalation</li> <li>• TMJ capsule moves anterolateral</li> </ul>
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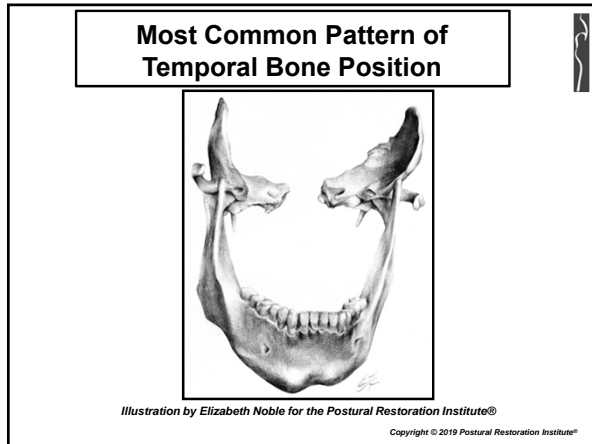
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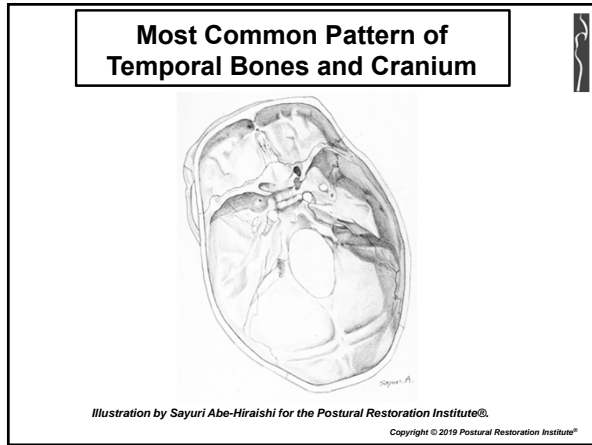
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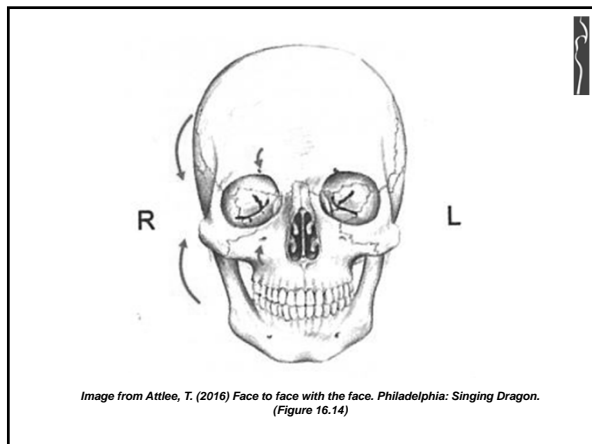
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**RE-TENSING TEMPORAL REST  
TECHNIQUES**



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**Anterior Interior Chain (Left)  
Manual Technique** 

**Sibson (Right) Manual Technique** 

**Flexion Movement Fronto-Occipital  
Hold Manual Technique** 

**Frontal Occipital (Right)  
Manual Technique**

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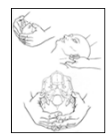
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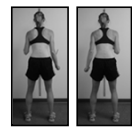
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**Alternating Rotation of the  
Temporals** 

**Synchronous Rotation of the  
Temporals** 

**Standing Resisted Alternating  
Tricep Pull Downs** 

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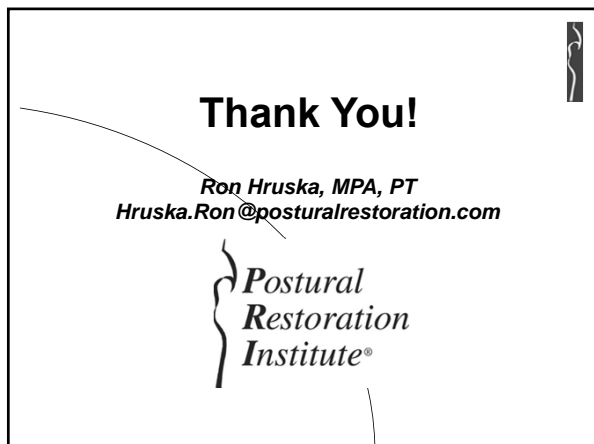
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## Anterior Interior Chain (Left) Manual Technique

### Goal:

To increase chest excursion on anterior right and posterior left, and to release malpositioned cervical spine.

### Position:

Patient positioned supine with knees supported in a 90-90 position.  
Operator at the head of patient. Operator's left hand on patient's left body of sternum.  
Tip of operator's left third finger should be slightly below and around xiphoid process.  
Operator's right hand is underneath the patient's central right back with the most lordotic apexed vertebrate between third and fourth fingers.

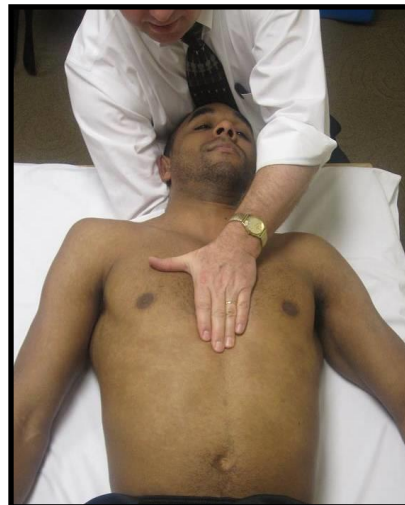
### Inhalation:

Upon "air in" pull, guide and rotate more with your right hand (back hand) and forearm.  
"Push", guide, rotate and hold the upper left chest with your left hand as you slightly pull the entire chest with your right hand.

### Exhalation:

Upon "air out" guide left ribs down, pull right thoracic up and hold at "pause" phase of diaphragmatic breathing.

*\*To assist the patient's ability to accept manual guidance upon exhalation, consider having the patient exhale through a straw.*





## Sibson (Right) Manual Technique

### Goal:

To release temporal styloid, mastoid and zygoma soft tissue.

### Position:

Patient positioned supine with knees supported in 90-90 position. Operator at the head of patient. Operator's left hand on patient's right chest with the left thumb next to right clavicle. Operator's right hand secured around anterior lateral right neck.

### Inhalation:

Upon "air in" guide airflow into the right chest with left hand by slightly lifting palm and rotating hand up and toward brachium. Right hand secures neck.

### Exhalation:

Upon "air out" secure neck with right hand and depress or guide the right chest down with left hand. *Reverse hand position for Sibson (Left).*



*Sibson's fascia: Thoracic inlet measures 4 by 2 inches, attaches C7-T1 around first rib to manubrium, also attaches to cupula of lung. Comprised of fascia from the scalenes and the longus colli muscles. Thoracic duct travels up through and down through this diaphragm before entering into the venous circulation (left internal jugular and subclavian or brachiocephalic veins).*





## FLEXION MOVEMENT FRONTO-OCCIPITAL HOLD

### Objectives:

- To assess the amount of inherent cranial motion during flexion (and therefore during external rotation).
- To directly correct an extension lesion.
- To indirectly correct a flexion lesion.
- To assess the amount of motion of any particular cranial bone, within the context of the cranial motion as a whole, during the expansion phase of the cranial mechanism.

### Movement:

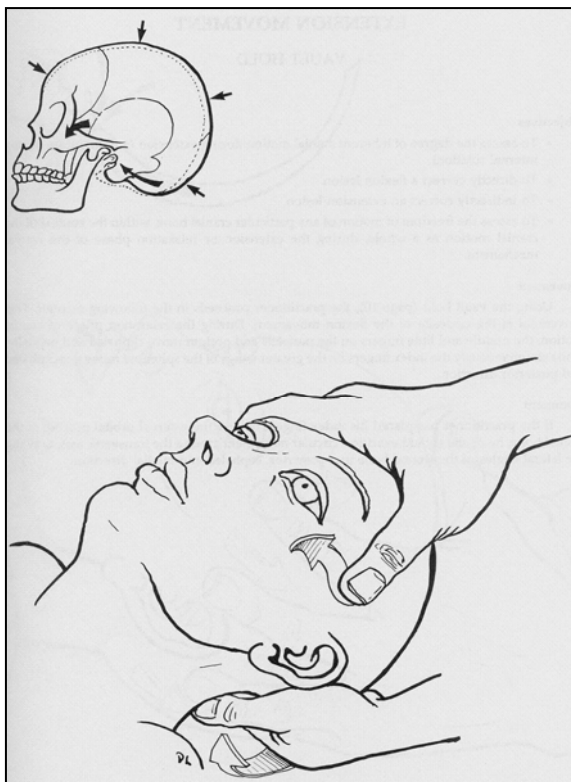
Using the fronto-occipital hold, the practitioner proceeds in the following manner. During the expansion phase of the cranial mechanism, simultaneously:

- the lower hand, under the occiput, brings it caudally and anteriorly, in a circular movement around its transverse axis;
- the upper hand, draws the greater wings of the sphenoid anteriorly and caudally, around its transverse axis.

### Comment:

When the upper hand grips the greater wings of the sphenoid, the practitioner should avoid putting any pressure on the frontal bone, which could induce a paradoxical movement.

When the upper hand has made its contacts behind the external orbital process of the frontal bone, it should execute the same movement as described above around its transverse axis. However, the palm of the hand pressing on the frontal bone should press on the upper part of the metopic suture in order to more fully appreciate the motion.



*Taken from: Atlas of manipulative techniques for the cranium and face. Gehin A. 1981.*



## FRONTAL OCCIPITAL (RIGHT)

### **Goal:**

To restore right sphenobasilar flexion and to normalize lateral expansion of cranium.

### **Position:**

Patient positioned supine with knees supported in a 90-90 position.

Operator is seated to the left of patient's head, with left hand resting on the table top holding the patient's occipitosquamo area. The left hand is cupped so as to hold the patient's occiput with the tip of the fingers on the opposite occipital angle. The angle of the occipital squamo closest to the operator rests on the thenar or hypothenar eminence. The right hand is placed over the frontal bone, with the tip of the index finger and middle finger on patient's right greater wing of sphenoid and the thumb pad on the left greater wing of the sphenoid.

### **Inhalation:**

Move left hand caudally and anteriorly with the tips of fingers moving right occipital angle forward and anteriorly more than the left, around the occiput transverse axis. Palm of left hand gently lifts left occiput up and toward the right. Right hand continues to supinate (externally rotate) and "pull" in cephalic direction, with thumb guiding left greater wing forward and laterally to the right.

*Goal: Maximize right OA extension*

### **Exhalation:**

Right hand draws the greater wings of the sphenoid anteriorly and caudally around its coronal axis, with the tip of the index finger and middle finger moving the right greater wing of sphenoid more into a caudal direction and the thumb moving the left greater wing of sphenoid more into an anterior direction, around the sphenoid transverse, coronal, and sagittal axis. Simultaneously, the left hand's tip of the fingers "lift" the opposite occipital angle as the forearm supinates, to "drop" or posteriorly rotate the left atlas into more flexion on the occiput.

*Goal: Maximize left OA flexion*



## ALTERNATING ROTATION OF THE TEMPORALS

### Objectives:

- To normalize the lateral expansion of the cranium.
- To temporarily reduce (or, less frequently, to increase) the frequency of the cranial rhythmic impulse.
- To restore the balance of the cranial mechanism when it has been disturbed for any reason, including improper treatment. This technique has a calming effect; accordingly, many practitioners conclude their treatments with it.

**Position of the patient:** Supine, comfortable and relaxed.

**Position of the practitioner:** Seated at the patient's head, forearms resting on the treatment table which has been adjusted to a convenient height.

**Points of contact:** The practitioner's hands are supine, with fingers intertwined. The hands cup the upper cervical spine and the occipital squama. Thumbs are placed parallel to the anterior border of the mastoid processes. The thenar eminences contact the corresponding mastoid portions of the temporal.

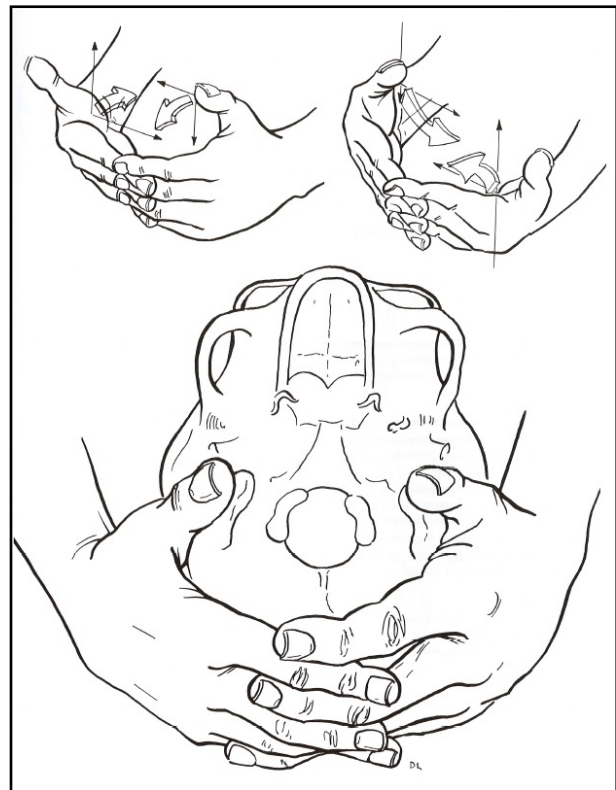
**Movement:** The alternating movement is induced solely by the index or middle fingers, which are crossed at the second metacarpal joint. The other fingers simply follow the movement.

The practitioner alternately rolls one index finger on top of the other (or a middle finger on top of the other) at the second joint, which acts as a pivot. The passive thumbs move in an arc, taking the temporals with them.

**Mode of operation:** If stimulation is the objective, the frequency (or amplitude) of the movement is very gradually increased.

If relaxation is the objective, the course of each phase is gradually reduced until movement is almost imperceptible. This is continued until a release is obtained. This approach is the most widely used at the conclusion of a cranial treatment.

**Comment:** This technique is very easily performed. Nonetheless, the left-right balance of the hands is sometimes difficult for the poorly coordinated practitioner. It is very important that a symmetrical balance of temporal motion be restored at the conclusion of this technique.



*Taken from: Atlas of manipulative techniques for the cranium and face. Gehin A. 1981.*



## SYNCHRONOUS ROTATION OF THE TEMPORALS

### Objectives:

To provide a physiological stimulation of the cranial mechanism by increasing both its amplitude and rhythm.

### Position of the patient:

Supine, comfortable and relaxed.

### Position of the practitioner:

Seated at the patient's head, forearms resting on the treatment table which has been adjusted to a convenient height.

### Points of contact:

The practitioner's hands are supine, fingers interlaced, cupping the occipital squama. The practitioner places the thumbs parallel to the anterior border of the mastoid processes, the thenar eminences touching the corresponding mastoid portions.

### Movement:

Movement is generated by the deep flexor muscles of the fingers.

During the expansion phase of cranial motion, the tips of the practitioner's thumbs exert, on the top of the mastoid processes, a gentle pressure which is progressive and constant, moving medially and posteriorly.

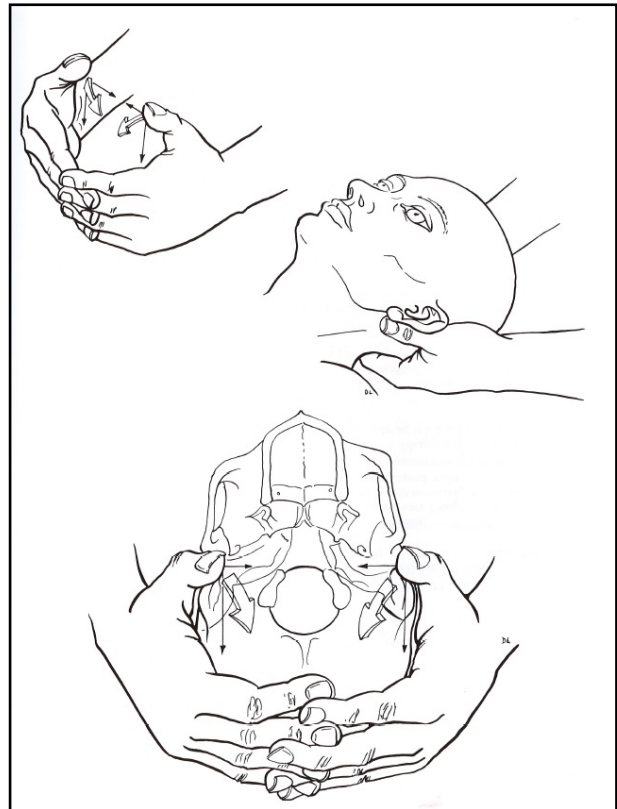
During the relaxation phase, the practitioner progressively relaxes the pressure. He or she can, nevertheless, increase the amplitude of this phase by exerting pressure with the thenar eminences on the mastoid portions, medially and posteriorly.

The amplitude of the movement is then increased in both phases of cranial motion.

If desired, an increase in the frequency of cranial motion can easily be obtained by gradually increasing the rate of the maneuver.

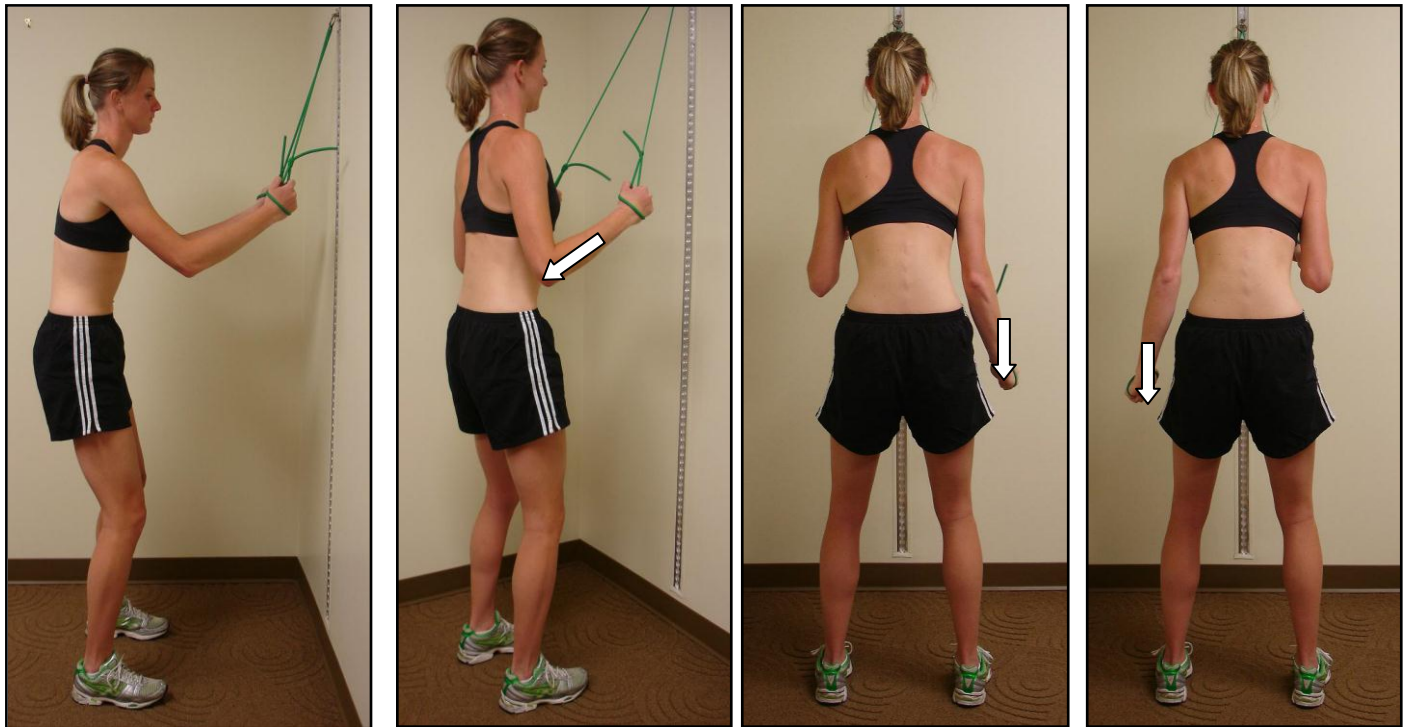
### Comment:

While utilizing the mastoid lever, the practitioner must be very careful to respect the cranial articular physiology. Acceleration of the rhythm or increasing the amplitude of the motion should only be done very gradually.



*Taken from: Atlas of manipulative techniques for the cranium and face. Gehin A. 1981.*

## Standing Resisted Alternating Tricep Pull Downs



1. Anchor a piece of tubing in the top of a door.
2. Stand facing the door, and place ends of the tubing in each hand.
3. Round your back, and tuck your bottom under you.
4. Pull your shoulder blades down and together.
5. Keeping your back rounded and shoulder blades together, pull your elbows back to your sides.
6. Straighten your right elbow against the resistance of the tubing. You should feel the muscles on the back of your right arm engage. Keep your left elbow bent at a 90-degree angle so that the muscles on the back of your left arm engage as well.
7. Hold this position while you take 4-5 deep breaths, in through your nose and out through your mouth.
8. Slowly bend your right arm and straighten your left elbow against the resistance of the tubing. You should feel the muscles on the back of your left arm engage. Keep your right elbow bent at a 90-degree angle so that the muscles on the back of your right arm engage as well.
9. Hold this position while you take 4-5 deep breaths, in through your nose and out through your mouth.
10. Relax and repeat 4 more times with both arms.

**Reference Center(s):** *Left abdominals, Left heel, Right arch*