Headaches
Triggers & Treatment
The National Stroke Association reports that 97% of Americans do not know the symptoms of a stroke. In an effort to educate the public, they developed the FAST test.

A stroke is a medical emergency and should not be taken lightly or the symptoms ignored. If you experience these symptoms, please seek medical attention immediately. Rapid diagnosis and treatment is essential to obtain the best outcomes.

If you suffer any of these symptoms, or the ones listed below, get immediate medical attention!

- A sudden severe headache without apparent reason
- Sudden numbness or weakness in the face, arms, legs, or one whole side of the body
- Sudden loss or dimness of vision especially if it’s only in one eye
- Sudden loss of balance, unsteady gait, unexplained dizziness
- Sudden confusion, slurred speech, or difficulty swallowing
- Sudden loss of consciousness

What is FAST?

F = Face
A = Arms
S = Speech
T = Time

What is the FAST test similar to the STR Test?

F = Face: Ask the person to smile. Does one side of the mouth or face droop?
A = Arms: Ask the person to raise both arms. Does one arm drift downward or can't be raised?
S = Speech: Ask the person to repeat a sentence. Can they repeat it correctly? Do they slur the words?
T = Time: If the person exhibits any problems with these, it’s time to call for emergency help.

What is a transient ischemic attack (TIA)?

A transient ischemic attack (TIA) is an event, sometimes called a mini-stroke, or stroke symptoms that always last less than 24 hours before disappearing. While TIAs generally do not cause permanent brain damage, they are a serious warning sign of stroke and should not be ignored!

More than one-third of all people who have experienced a TIA will go on to have an actual stroke. In fact:

- 5% of people will have a stroke within two days of their TIA
- 11% of people will have a stroke within 90 days of their TIA
- 14% of people will have a stroke within one year of their TIA
- 20% of people will have a stroke within 2 years of their TIA

What are the symptoms of a TIA?

The symptoms of a TIA and stroke are basically the same. Someone having a TIA or stroke may experience one or more of the following symptoms:

- Sudden numbness or weakness of the face, arm, leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination

If you have any of these symptoms or see them in someone else, even for a short time, call 911 or get to the hospital fast. Treatment can be more helpful if given quickly. Stroke is an Emergency! Every minute counts!

What causes a TIA?

Blood vessels carry blood throughout the body. When a blood vessel in the brain becomes blocked for a short period of time, the blood flow to that area of the brain slows or stops. This lack of blood (and oxygen) often leads to temporary symptoms such as slurred speech or blurry vision.

TIAs are usually caused by one of three things:

- Low blood flow at a narrow part of a major artery carrying blood to the brain, such as the carotid artery.
- A blood clot in another part of the body (such as the heart) breaks off, travels to the brain, and blocks a blood vessel in the brain.
- Narrowing of the smaller blood vessel in the brain, blocking blood flow for a short period of time; usually caused by plaque (a fatty substance) build up.
### Headaches

#### Headache Statistics
- 45 Million people experience constant headaches
- 25 Million people experience debilitating headaches
- 1 Million people experience cluster headaches
- 80 Million doctor office visits due to headaches
- 157 Million workdays are lost due to headaches
- $500 Million over-the-counter remedies
- $6 - 8 Billion in lost work, healthcare and medication
- 1 in 7 people miss one day of work per month
- 1/3 of brain tumors are accompanied by headaches
- 55% are frustrated with their doctor
- 70% to 80% have hereditary influences
- 65% of female suffer headaches during menstruation
- 75% to 80% of females are headache free during pregnancy
- During treatment with birth control pills:
  - 50% of females report an increase
  - 40% show no change
  - 10% are improved

#### Anticoagulants
- Heparin Injection
- Coumadin (Warfarin) Tablets
- Persantine (Dipyridamole) Tablets
- Ticlid (Ticlopidine) Tablets
- Miradon (Anisindione) Tablets

#### Common Medical Tests for Headaches
- Blood
- EEG
- EKG

#### Headache Types
- Organic
- Tension-Type (muscle contraction)
- Vascular (migraine and cluster)
- Analgesic Rebound
- Hangover

#### Headache Triggers
- Stress
- Allergies
- Hormones
- Depression
- Dehydration
- Constipation

#### Drug Treatments
- Pain relieving measures
- Abortive
- Prophylactic

#### How Headache Medications are Administered
- Oral
- Intranasal
- Rectal
- Sublingual
- Intermuscular
- Intervenous

#### Ways to Determine Headache Patterns & Triggers
- Forms – intake, questionnaires, pain scale
- Diaries – food, medication, headache patterns

#### Diet and Headaches
- Nuts, peanut butter
- Foods containing nitrites - cured meats
- Foods containing phenylethylamine - chocolate, alcohol
- Foods containing tyramine - ripened cheeses and anything fermented, pickled or marinated
- Foods containing monosodium glutamate (MSG)
- Sour cream
- Bananas
- Citrus fruits
- Chicken livers, pate'
- Sourdough bread, breads and crackers
- Figs, raisins, papayas, avocados, red plums
- Broad beans, lima beans, fava beans, snow peas
- Excessive amounts of tea, coffee, or cola beverages
## Contributing Pain Factors

<table>
<thead>
<tr>
<th>Biomechanical Dysfunction</th>
<th>Postural Distortion</th>
<th>Ischemia</th>
<th>Trigger Point</th>
<th>Nerve Compression / Entrapment</th>
<th>Nutrition</th>
<th>Emotional State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imbalance in the musculoskeletal system resulting in improper movement patterns.</td>
<td>Imbalance in the muscular tonus system resulting in movement of the body off the coronal and mid-sagittal planes.</td>
<td>Lack of blood – localized tenderness.</td>
<td>A hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena. Types of myofascial trigger points include: active, associated, attachment, central, key, latent, primary, and satellite.</td>
<td>Compression = Pressure on a nerve by an osseous or cartilaginous structure. Entrapment = Pressure on a nerve by soft tissues.</td>
<td>Water</td>
<td>Fresh Fruits and Vegetables</td>
</tr>
</tbody>
</table>

## Laws

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>A uniform or constant fact or principle.</td>
<td>Rudolph Arndt, German Psychiatrist, 1835-1900</td>
<td>If muscle ends are brought closer together then the pull of tonus is increased, thereby shortening the muscle, which may even cause hypertrophy. If muscle ends are separated beyond normal, then tonus is lessened or lost, thereby “weakening” the muscle.</td>
<td>John Hilton, English Surgeon, 1804-1878</td>
<td>When an impulse has passed once through a certain set of neurons to the exclusion of others, it will tend to take the same course on future occasions, and each time it traverses this path the resistance will be less.</td>
<td>Sir Isaac Newton, Principia Mathematica, 1687</td>
<td>Julius Wolff, German physician</td>
</tr>
<tr>
<td>Weak stimuli excite physiological activity, moderately strong ones favor it, strong ones retard it and very strong ones arrest it.</td>
<td>**</td>
<td></td>
<td>A nerve trunk that supplies a joint also supplies the muscles of the joint and the skin over the insertions of such muscles.</td>
<td>To every action there is always an opposed equal reaction, or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.</td>
<td>Every change in the form and the foundation of a bone, or in its function alone, is followed by certain definite changes in its internal architecture and secondary alterations in its external conformation (form follows function).</td>
<td></td>
</tr>
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</table>

## Stages of Rehabilitation

**Proper rehabilitation of injured soft tissues**
- It is important to understand that when rehabilitating injured soft tissues, certain steps should be followed and a proper order established to insure the fastest possible recovery without injury.
  - Care for acute injury and control swelling.
    - Rest the injury
    - Ice the injury
    - Compress the injury with an ace bandage
    - Elevate the injury above your heart
  - Eliminate spasms and hyper-contraction in the tissues (neuromuscular therapy)
  - Restore proper biomechanics (gait repatterning and movement exercises)
  - Restore flexibility to the tissues (stretching)
  - Rebuild the strength of the injured tissues (weight training)
  - Rebuild endurance (aerobic exercises)
### History & Assessment:

#### History / Intake
- Work ergonomics or ADLs
  - Neck - computer screen off to the side, holds telephone with shoulder
  - Spine - Slumped posture, improper lifting, high heels, wallet, obesity
- Upper - Slumped posture, holds telephone with shoulder, ADL, typing, ergonomics
- Lower - high heels, arches, walking/running surface
- Hormonal – headaches, back pain during menstrual, Thyroid and fatigue
- Pharmaceutical (Analgesic rebound headaches)
- Nutritional – Blood sugar levels
- Emotional well-being = Home, work, relationships, health, hereditary

### Postural Analysis – Static:
- Arches
- Leg lengths
- Innominate bones / Pelvis obliquity (tilt), ASIS, PSIS, In flare,
- A/C Joints
- Internal/external rotation of arms
- Forward head/neck tilt

### Gait – Dynamic:
- Heel strike, mid stance, toe off
- Arches
- Leg lengths
- Innominate bones, S/I Movement
- Normal cross/crawl
- Ease of movement

### Orthopedic Assessment:
- process of elimination
- ROM - Joint vs MM
- Structure – Bone Disc
- Functional
- Muscular
- Neural
- Visceral

### Palpation Exam:
- Muscle test
- Bone landmarks
- Precise vs general

### Ischemic Pain vs TrP:
- Ischemia = Localized tenderness W/O Referral
- MM constantly contracted 30% or more of max contractual force
- Precursor to TrP

### Myofascial TrPs:
#### Definition:
- Hyperirritable
- Referral
- Palpable nodule in a taut band
- Sensitive to palpation

#### Central & Attachment:
- Central – Dysfunctional end plate located near the center of muscle fibers
  You will feel (depending on body) a palpable nodule because the centralsarcomeres slide in constant fully shortened.
- Attachment – Musculotendinous junction and/or the osseous attachment
  No palpable nodule

### Active vs Latent:
- Active – Phenomena is recognized by client
- Latent – non recognized

### Primary vs Satellite (Key):
- Primary – caused by acute or chronic overload ie posture, repetitive strain
  NOT BY ANOTHER TrP
- Key – a primary TrP that actives satellite Trps
  Satellite – is a caused by Key TrP and is inactivated /resolved or disappears when Key TrP is inactivated /eliminated.

### Referral types or Phenomena people may describe:
- Pain most common
- Thermal sensations (hot or cold)
- Phenomena that mimics what patients describe as a “Pinched nerve”
- Burning
- Tingling
- Numbness
- Unusual terms (fatigued, asleep, action, pressure, etc)

73% refer away from TrP
27% radiate regionally around TrP

### Compression VS Entrapment:
- Nerve affected by 2 types of tissue
- Clarify for discussion
- Compression = Osseous, IVD (Intervertebral Disk)
- Entrapment = MM, Tendons, Lig, Fascia

### Communication:
- Appropriate pressure
- Local tenderness vs Referral (ischemic vs TrP)

### General Directions

- Active vs Latent
- Hold / Release time 8- 12
- Description of release - easing, you let go, dissipating, melting, etc
- Feeling the release
  - Client or Therapist

### Draping:
- Full sheet draping
- Towels
- Gown & Shorts
- Advise & consent
  - Moving sheet or towel
  - Opening gown
  - Lowering shorts

### Techniques:
- Fingers / Thumbs / depending on region possibly Forearm & Elbows
- Gliding
  - Specific VS General

### Compression:
- Static
- Flat
- Pincer = C-Clamp

### Friction:
- With Fiber
- X-Fiber
- Multi Directional or combo of With & X

### Pressure:
- Establish appropriate amount of pressure range
- Mild to moderate discomfort
- Determined by patient
- Scale 1-10 (4, 5, 6, ?7)
- Word scale (More, less)
- Tonality of pain level
- Body language
- With T-bar vs. hand or thumb (Flat hand, thumb, t-bar)

### Lube:
- To lube or not to lube that is the question
- What type
- How much
- Area specific
- Sheet / Tissue / Gown

### Pressure Bar:
- How to hold
- Where/When to use
- Sheet / Tissue / Gown
- Palpate with treating hand
The Autonomic Nervous System

<table>
<thead>
<tr>
<th>Sympathetic Division</th>
<th>Parasympathetic Division</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General:</strong></td>
<td></td>
</tr>
<tr>
<td>• Spends body resources</td>
<td>• Conserves body resources</td>
</tr>
<tr>
<td>• Functions during arousal</td>
<td>• Generally represents a body calmness</td>
</tr>
<tr>
<td>• Prepares body for “fight or flight”</td>
<td>• Generally antagonistic to sympathetic system</td>
</tr>
<tr>
<td><strong>Effects of Sympathetic Activity:</strong></td>
<td><strong>Effects of Parasympathetic Activity:</strong></td>
</tr>
<tr>
<td>• Increases heart rate</td>
<td>• Decreases heart rate</td>
</tr>
<tr>
<td>• Increases respiratory rate</td>
<td>• Decreases respiratory rate</td>
</tr>
<tr>
<td>• Increases blood pressure</td>
<td>• Decreases blood pressure</td>
</tr>
<tr>
<td>• Causes bronchiolar dilation</td>
<td>• Causes pupillary constriction</td>
</tr>
<tr>
<td>• Causes pupillary dilation</td>
<td>• Causes bronchiolar constriction</td>
</tr>
<tr>
<td>• Increases perspiration</td>
<td>• Increases gastrointestinal motility</td>
</tr>
<tr>
<td>• Causes vasoconstriction</td>
<td></td>
</tr>
<tr>
<td>• Stimulates adrenal glands to release epinephrine and norepinephrine</td>
<td></td>
</tr>
<tr>
<td>• <strong>Decreases</strong> gastrointestinal motility</td>
<td></td>
</tr>
</tbody>
</table>

Cervical Range-Of-Motion (ROM)

For muscles producing movements reference:

• Flexion / Extension

• Rotation

• Lateral Flexion
Vertebrobasilar Circulation Assessment

• Vascular insufficiency may be aggravated by a positional change in the cervical spine.
• Assessment of vertebrobasilar circulation must be done prior to manual therapy of the cervical region.
• It should be noted that vascular accidents might still occur with no evidence of vascular insufficiency, deficit, and negative provocative procedures.
• Assessment of vertebrobasilar circulation by provocative or functional testing.
• Allow a 10-second interval between tests to ensure that there are no latent symptoms.

Clinical Signs and Symptoms of Cerebrovascular Episodes

Vertigo, dizziness, giddiness, light-headedness
Drop attacks, loss of consciousness
Diplopia (double vision)
Dysarthria (disturbance of articulation or spacticity of muscles)
Dysphagia (difficulty in swallowing)
Ataxia (inability to coordinate the muscles in voluntary movement) of gait
Nausea, vomiting
Numbness on one side of the face
Nystagmus (drowsiness)

Barre-Lieou Sign

Procedure: • With patient seated.
  • Instruct them to rotate their head to one side and then the other.
Rationale: • Rotating the head causes compression of the vertebral artery opposite the side of head rotation.
  • This tests patency of vertebral artery on same side of head rotation.
  • Signs of a positive test are: Vertigo, dizziness, visual blurring, nausea, faintness, and nystagmus (drowsiness).
  • This is indicative of buckling vertebral artery syndrome.

Maligne’s Test

Procedure: • Patient in the seated position.
  • Patient to extend and rotate their head and hold position for 15 to 40 sec.
  • Repeat the test with the head rotated to the opposite side.
Rationale: • This places a motion induced compression on the vertebral artery on opposite side of head rotation.
  • Signs of a positive test are: Vertigo, dizziness, visual blurring, nausea, faintness, and nystagmus (drowsiness).
  • This test is indicative of vertebral, basilar, or carotid artery stenosis (narrowing).
Advantages of Postural Analysis

Advantages of Postural Photos

• Document posture before and after a series of treatments.
• Educate patients about their postural distortions showing the cause of the pain, muscle weakness, etc.
• Show patients, physicians and insurance companies treatment progress.
• Present your patients with clear solutions.
• Record and document positive postural changes.
• Customize treatment plans and educate your patients with Trigger Point and Muscle Movement Charts.

Dominant Eye Test

The dominant eye is the eye that looks directly at an object and increases accuracy of the postural analyst. The non-dominant eye looks at the same object at a slight angle. This small difference provides depth perception. Being right or left handed will not necessarily determine if you are right or left eye dominant.

1. Extend both arms in front of your face with the palms of the hands facing away from you. Bring both hands together so that the space between the thumb and index finger of each hand forms one small circle approximately 1 inch in diameter.
2. With both eyes open look through the circle formed by your hands at an object located across the room.
3. Make the circle between the hands as small as possible so you can still see the object.
4. Close your left-eye and if the object is still seen through the circle, you are right-eyed dominant. If the object is no longer seen through the circle, you are left-eyed dominant.
5. Now open the left-eye and close your right-eye. If the object is still seen through the circle, you are left-eyed dominant. If the object is no longer seen through the circle, you are right-eyed dominant.
6. Using a camera or your dominant eye move your body from right to left until the plumb line is in alignment with the center line of the Postural Analysis Grid Chart™.
**Postural Analysis Checklist:**

- Plumb line should not touch the floor.
- Postural Analysis Grid Chart™ should be level and aligned with the plumb line.
- Client should be wearing clothing that allows for visual observation of body contours.
- Client should be standing in bare feet.
- Client will stand between Postural Analysis Grid Chart™ and the plumb line, but not be touching the plumb line or chart.

**Anterior and Posterior views:**

- Client’s heels are equally spaced from plumb line and chart.

**Lateral view:**

- Plumb line is immediately anterior to lateral malleolus.
- Patient should place hair behind their ears.

- Stand back from the plumb line. Keeping your head level and using your dominate eye (see dominant eye test) or if using a camera move from side to side (right to left) until the plumb line is lined up with the center line of the grid chart.

- Take photo of client and/or make notes for objective findings.

**Additional Objective Findings for Considerations:**

- Orthopedic Assessments
- Anatomical Deviations
- Range Of Motion (ROM)
- Innominate Bone Positioning
- Gate / Dynamic Posture
- Nutrition
- Medial Arch of the Foot
- Mental State
Postural Analysis

Standing

Supine and Prone

Name: ____________________________
Date: ____________________________
Notes:

_________________________________

_________________________________

_________________________________

_________________________________
Postural Analysis

**Anterior View:**
- Client is positioned so that their heels are equally spaced from the plumb line (centerline) and the posture chart.
- Client must not be touching the plumb line or the posture chart.
- Review section labeled “Postural Analysis Checklist”.

Below is a list of landmarks that reflect ideal skeletal alignment with the midsagittal plane and/or plumb line.

<table>
<thead>
<tr>
<th>Surface Anatomy</th>
<th>Anatomical Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midway through the nose</td>
<td>Midline of internasal suture</td>
</tr>
<tr>
<td>Midway through mandible</td>
<td>Midline of symphysis menti</td>
</tr>
<tr>
<td>Midway through the jugular (suprasternal) notch</td>
<td>Midline of the manubrium of the sternum</td>
</tr>
<tr>
<td>Umbilicus - if in proper position (usually is off center)</td>
<td>Midline of vertebral bodies</td>
</tr>
</tbody>
</table>

Key structures that should be on the transverse horizontal plane:
- Acromioclavicular Joints
- Anterior Superior Iliac Spines

**Lateral View:**
- Client is positioned so that the plumb line is immediately anterior to the lateral malleolus.
- Have client place hair behind their ears.
- Client must not be touching the plumb line or the posture chart.
- Review section labeled “Postural Analysis Checklist”.

Below is a list of landmarks that reflect ideal skeletal alignment with the coronal plane and/or plumb line.

<table>
<thead>
<tr>
<th>Surface Anatomy</th>
<th>Anatomical Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly posterior to the apex of the coronal suture</td>
<td>Slightly posterior to the apex of the coronal suture</td>
</tr>
<tr>
<td>Through lobe of the ear</td>
<td>Through external auditory meatus</td>
</tr>
<tr>
<td>Slightly anterior to midline of neck process, anterior inferior aspect of C-7</td>
<td>Through bodies of the cervical vertebrae, odontoid</td>
</tr>
<tr>
<td>Through shoulder if the arm hangs in normal position</td>
<td>Slightly posterior to the midline of the head of the humerus</td>
</tr>
<tr>
<td>Slightly anterior to the elbow (if arm hangs normal)</td>
<td>Slightly anterior to midline of the distal end of the humerus</td>
</tr>
<tr>
<td>Slightly posterior to the mid-way of the trunk</td>
<td>Through bodies of lumbar vertebrae, anterior superior aspect of L-1</td>
</tr>
</tbody>
</table>

Key structures that should be assessed:
- Relationship of Posterior Superior Iliac Spine (PSIS) to Anterior Superior Iliac Spine (ASIS)

**Posterior View:**
- Client is positioned so that their heels are equally spaced from the plumb line (centerline) and the posture chart.
- Client must not be touching the plumb line or the posture chart.
- Review section labeled “Postural Analysis Checklist”.

Below is a list of landmarks that reflect ideal skeletal alignment with midsagittal plane and/or plumb line.

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Midline of the sagittal suture</td>
<td>Midline of the sagittal suture</td>
</tr>
<tr>
<td>Midway through external occipital protuberance</td>
<td>Midline of the external occipital protuberance</td>
</tr>
<tr>
<td>Midway through spinous processes</td>
<td>Midway through spinous processes</td>
</tr>
<tr>
<td>Natal cleft</td>
<td>Tipt of coccyx</td>
</tr>
<tr>
<td>Achilles tendon</td>
<td>Talar positioning</td>
</tr>
</tbody>
</table>

Key structures that should be on the transverse horizontal plane:
- Posterior Superior Iliac Spines
- Inferior Angles of Scapule
Origin
- The medial third of the superior nuchal line, external occipital protuberance, ligamentum nuchae, and spinous processes of C7 - T12 vertebrae.

Insertion
- The lateral third of the clavicle, acromion and spine of the scapulae.

Function
- Elevates, retracts, and rotates the scapula. The superior fibers elevate, the middle fibers retract, and the inferior fibers depress the scapula. Superior and inferior fibers act together in superior rotation of the scapulae.

Structural Considerations
- Upper trapezius is stressed with forward head posture.
- Upper trapezius could be involved on high shoulder side.
- Middle trapezius involved with shoulder retraction.
- Lower trapezius could be involved on low shoulder side.

Indicators for treatment
- Headaches – trigger points in the upper and middle trapezius.
- Unequal shoulder heights.
- Pain along the vertebral border of the scapulae, at the acromioclavicular joint and base of occiput.
- Pain during movement of the scapulae.

Palpation Hints
- Treat through Kleenex, hospital gown or sheet if skin has been lubricated and your fingers are slipping.

Contraindications and Precautions
- Immediately following surgery.

Peripheral Nerve Entrapment
- Occipital nerve (dorsal ramus C3).
- Cutaneous branches of dorsal rami.

Nerve root compression possibilities
- Cervical nerve (C2 - C4)

Trigger Point
- The upper trapezius will refer along the posterior and lateral aspect of the neck, concentrating along the mastoid process and then continuing over the cranium, concentrating right behind the eye. These patterns can be deep in the head. Many times your clients will report that they have a headache that starts in their temple and then works back to their neck.
- The middle trapezius will have a trigger point that will refer right into the posterolateral aspect of the cervical region, concentrating right at the base of the occiput and then we also have a trigger point that starts in the lower trapezius, right around the inferior angle of the scapula that will refer pain all the way out laterally to the acromial process and along the upper trapezius and again into the base of the occiput.
Step 1 - Upper trapezius

Patient in the prone position.
- Shorten upper trapezius.
- No lubrication.
- Treat the superior portion of upper trapezius from across the body (compress and $).

- Treat the lateral portion of upper trapezius medial to lateral (compress and $).

Step 2 - Uncoil

- No lubrication.
- Uncoil upper trapezius.

NOTE: Thumb is stationary stabilizing the posterior fibers, while the fingers uncoil the anterior fibers.

Step 3 - Middle trapezius

Retract scapulae (place support under anterior shoulder).
- Therapist standing at level of head, facing feet.
- No lubrication.
- Treat medial to lateral (compress and $).
Origin
- Sternal head: Anterior surface of the manubrium.
- Clavicular head: Upper surface of medial 3rd of the clavicle.

Insertion
- Lateral surface of the mastoid process. Lateral half of the superior nuchal line of the occipital bone.

Function
- Singly it draws the head toward the shoulder and rotates it, pointing the chin cranially and to the opposite side. Together it flexes the head and raises the thorax when the head is fixed.

Structural Considerations
- The carotid sheath surrounds the common carotid artery, internal jugular vein and vagus nerve (CNX), and has fascial attachments to the posteromedial border of the sternocleidomastoid.
- Lying superficial to the anterolateral aspect of the sternum, the great auricular nerve, external jugular vein and the transverse cervical nerve.

Indicators for treatment
- Anterolateral cervical pain and/or forward head posture.
- Sternal head: Pain in the occiput, across the check, in the sinuses, to the throat, to the sternum, and eye and face pain diagnosed as “atypical facial neuralgia”.
- Clavicular head: Frontal headaches, earaches, and dizziness.

Palpation Hints:
- Treat through Kleenex if fingers are slipping on skin due to lubrication.

Contraindications and Precautions
- If pulse is palpated, stop immediately and reposition.
- Patient history of stroke, heart attack, phlebitis, thrombosis, etc.
- Pressure on the carotid sinus may cause syncope (fainting) and if the person happens to have a super sensitive carotid sinus it may cause cessation of the heart beat (temporarily or permanently). Located at the bifurcation of the common carotid artery at the level of C3 – C4 vertebral junction.
- See Structural Considerations

Peripheral Nerve Entrapment
- Spinal accessory nerve (CNXI)

Nerve root compression possibilities
- 2nd cervical nerve

Trigger Point
- Sternal head, trigger points will commonly refer into the forehead, the anterior cervical region, throat pain, discomfort or tightness. They may refer to the occiput, along the back of the head, or into the cheeks, they might refer distally into the sternum, even up into their eye.
Step 1 – Sternal head
- No lubrication, patient supine.
- Therapist standing or sitting at the head of table, facing feet.
- Muscle test by having the patient lift their head off the table.
- Support the patient’s head in a 45-degree cervical flexion, then add slight lateral flexion toward treating side.
- Work sternal head superior to inferior (compress and $).
  
  NOTE1: If pulse is palpated, stop and reposition treating hand.
  NOTE2: Turn the treating hand over to treat the lower third of the muscle. The thumb will be treating the posterior edge of the muscle.

Step 2 – Clavicular head
- No lubrication, patient is in same positions as in step 1.
- Work clavicular head superior to inferior (compress and $).
  
  NOTE1: If pulse is palpated, stop immediately and reposition treating hand.
  NOTE2: Turn the treating hand over to treat the lower third of the muscle. The thumb will be treating the posterior edge of the muscle.

Step 3 - Origin
- No lubrication.
- Using the finger or thumb, treat with superior to inferior (with fiber) and with medial to lateral (cross fiber) movements on the sternal and clavicular attachments.
  
  NOTE1: Sternal attachment – Examine superior aspect of sternal notch and superior 2 inches of anterior surface.
  NOTE2: Clavicular attachment – Examine superior and posterior aspect of clavicular attachment.

Step 4 - Insertion
- Lubrication.
- Examine the mastoid attachments with the fingers using an inferior to superior scooping movement (with fiber).
  
  NOTE: Be cautious of the styloid process when treating the anterior mastoid attachments.
Origin
- Rectus capitis posterior major: Spine of axis (C2)
- Rectus capitis posterior minor: Posterior tubercle of the atlas (C1)
- Obliquus capitis superior: Transverse process of atlas (C1)
- Obliquus capitis inferior: Spine of axis (C2)

Insertion
- Rectus capitis posterior major: Lateral part of inferior nuchal line of occipital bone
- Rectus capitis posterior minor: Occipital bone below inferior nuchal line
- Obliquus capitis superior: Occipital bone above inferior nuchal line
- Obliquus capitis inferior: Transverse process of atlas (C1)

Function
- Rectus capitis posterior major: Extension, lateral flexion and rotation of head
- Rectus capitis posterior minor: Extension and lateral flexion of head
- Obliquus capitis superior: Extension and lateral rotation of head
- Obliquus capitis inferior: Rotates atlas and skull around odontoid process of axis

Structural Considerations
- Trigger points are commonly caused by forward head posture, sustained upward head tilt, or sustained head rotation combined with tilt.
- The suboccipital muscles help provide and control movements of (nodding), rotation and side bending of the head.

Indicators for treatment
- Headaches, deep pain in the upper posterior cervical region, pain and/or restricted range of motion with lateral rotation, whiplash type injuries, occipital neuralgia, chronic intractable benign pain.
- Check if patient has been diagnosed with occipitoadontal, atlantoaxial, or C2 articular dysfunction.
- See Structural Considerations

Palpation Hints:
- During treatment the head should be in slight extension to shorten the superficial musculature.

Contraindications and Precautions
- Immediately following surgery or acute injury.

Peripheral Nerve Entrapment
- None

Nerve root compression possibilities
- C1 – C2

Innervation
- Muscular branches of posterior primary ramus of 1st cervical nerve (suboccipital)
- Muscular branches of posterior primary ramus of 1st cervical nerve (suboccipital)
- Muscular branches of posterior primary ramus of 1st cervical nerve
- Muscular branches of posterior primary rami of 1st & 2nd cervical nerve

Trigger Point
- Patterns typically refer
- Above the ear, Temporal region, Behind the eye.
Step 1 - Positioning and Muscle test
- No lubrication, patient supine.
- Therapist standing or seated at the level of shoulder facing head.
- Laterally rotate patients’ head away from treating side. Cervical spine is straight with slight extension.
- Non-treating hand supports patient’s forehead.
- Thumb of treating hand is positioned on the inferolateral border of the mastoid process.

NOTE: Mastoid process can easily be located by muscle testing the sternocleidomastoid.

Step 2 - Occipital ridge - With fiber
- Using the thumb, treat the inferior aspect of the occipital ridge with inferior to superior movements (with fiber).
- Start on the inferolateral border of the mastoid process and work medially in thumb width strips to the mid line.

NOTE: During Step 2 & 3 the following attachments are treated: sternocleidomastoid, splenius capitis, longissimus capitis, upper trapezius, semispinalis capitis, obliquus capitis superior, superior ½ of rectus capitis posterior major and rectus capitis posterior minor.

Step 3 - Occipital ridge - Cross fiber
- Now treat the same area as in Step 2 using medial to lateral movements (cross fiber).
- Start on the inferolateral border of the mastoid process and work medially in thumb width strips to the mid line.

Step 4 - C1-C2
- Palpate spinous process of C2 with finger tip. Place pad of thumb immediately lateral to finger tip / C2 spinous process
- Move thumb immediately superior to the C2 spinous process. Isolating the: obliquus capitis inferior and the inferior ½ of rectus capitis posterior major.
- Maintaining thumb location, treat with superior and inferior then medial and lateral movements.
Galea or Epicranial Aponeurosis

Frontalis

Occipitalis

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Step 1 – Grasp hair
- No lubrication, patient supine.
- The palm of the treating hand must stay in contact with the patient’s scalp, while the hair protrudes between the fingers of the treating hand.
- Keeping the palm against the scalp, clench the fingers of the treating hand into a fist.
- If sensitivity is present, hold for approximately 8 to 12 seconds for release, then reposition treating hand to adjacent area. If no sensitivity is present proceed to Step 2.

Step 2 – Traction
- While maintaining the fist clenched position from Step 1, traction the patient's hair away from the scalp.
- If sensitivity is present, hold for approximately 8 to 12 seconds for release, then reposition treating hand to adjacent area. If no sensitivity is present proceed to Step 3.

Step 3 – Traction clockwise
- While maintaining the clenched position from Step 1 and the traction from Step 2, turn treating hand clockwise.
- If sensitivity is present, hold for approximately 8 to 12 seconds for release, then reposition treating hand to adjacent area. If no sensitivity is present proceed to Step 4.

Step 4 – Traction clockwise
- While maintaining the clenched position from Step 1 and the traction from Step 2, turn treating hand clockwise.

Bald/Short Hair Option
- Place the pads of both thumbs on the scalp approximately 1 inch apart and press the thumbs toward each other creating a “S” shape with the skin.
Muscles listed by Pain Referral Areas
Head and Neck

VERTEX PAIN
Sternocleidomastoid (sternal), Splenius capitis

BACK OF HEAD PAIN
Trapezius (TrP1), Sternocleidomastoid (sternal), Sternocleidomastoid (cavicular), Semispinalis capitis, Semispinalis cervicis, Splenius cervicis, Suboccipital group, Occipitalis, Digastric posterior belly, Temporalis (TrP4)

TEMPORAL HEADACHE
Trapezius (TrP1), Sternocleidomastoid (sternal), Temporalis (TrP1, 2, 3), Splenius cervicis, Suboccipital group, Semispinalis capitis

FRONTAL HEADACHE
Sternocleidomastoid (clavicular), Sternocleidomastoid (sternal), Semispinalis capitis, Frontalis, Zygomaticus major

EAR AND TEMPOROMANDIBULAR JOINT PAIN
Lateral pterygoid, Masseter (deep), Sternocleidomastoid (clavicular), Medial pterygoid, Suprahyoid*, Infrahoid*, Longus capitis*, Longus Colli*, Platini*, Palatoglossus*

EYE AND EYEBROW PAIN
Sternocleidomastoid (sternal), Temporalis (TrP1), Splenius cervicis, Masseter (superficial), Suboccipital group, Occipitalis, Orbicularis oculi, Trapezius (TrP1), Suprahyoid*, Infrahoid*, Longus capitis*, Longus colli*

CHEEK AND JAW PAIN
Sternocleidomastoid (sternal), Masseter (superficial), Lateral pterygoid, Trapezius (TrP1), Masseter (deep), Digastric, Medial pterygoid, Buccinator, Platysma, Orbicularis oculi, Zygomaticus major

TOOTHACHE
Temporalis (TrP1, 2, 3), Masseter (superficial), Digastric (anterior)

BACK OF NECK AND SHOULDER PAIN
Trapezius (TrP1, 2, 3) Multifidi, Levator scapulae, Splenius cervicis, Infraspinatus Longus capitis, Longus colli*, Scalenes

THROAT AND FRONT-OF-NECK PAIN
Sternocleidomastoid (sternal), Digastric, Medial pterygoid, Suprahyoid*, Infrahoid*, Longus capitis*, Longus colli*