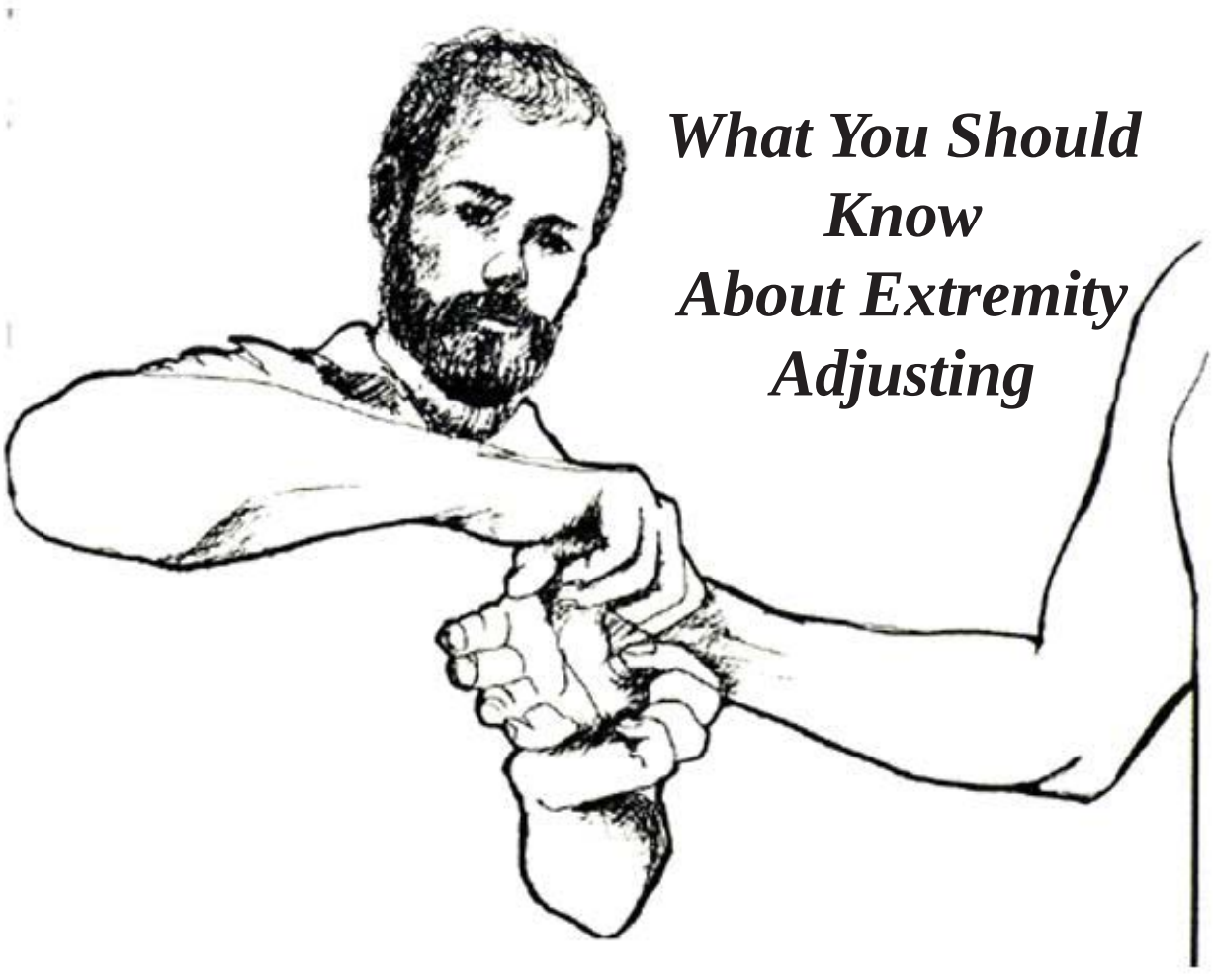
Advanced
Principles of TMJ, Rib & Shoulder Girdle Adjusting



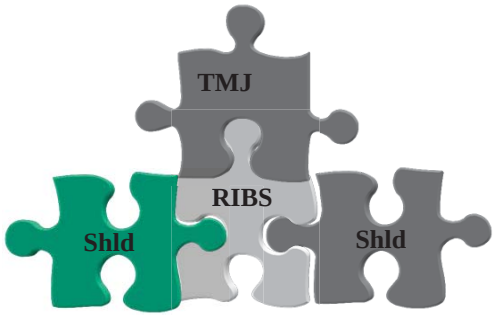
What You Should Know About Extremity Adjusting

I wrote this to simplify how to quickly evaluate and treat in an effective manor the TMJ, ribs and shoulder girdle with adjustments by qualified professionals.
Following these protocols has proven to be a safe and effective way of treating many dysfunctions that are typically difficult for most practitioners.
These adjustments are best learned in a hands on seminar where set up, contacts and line of correction can be checked by an instructor.

Introduction

- The TMJ, Ribs and Shoulder Girdle represents a compilation of diagnostics, joint mechanics and techniques for the treatment of subluxations in these areas.
- You will learn key insights and skills for conditions you probably did not understand before.
- This is an area of knowledge that can change your life and add joy to your patients life.

- Fixing the underlying problems whether acute or chronic is essential for stability of the spine, axial skeleton and extremities.
- The relationship of the T.M.J., ribs and shoulder girdle to cervical spine stability as well as upper extremity stability is what this information is about.



ACKNOWLEDGEMENTS

When talk and action blend together as one, results are the by-product. It is the search for results that led me to Doctors like Raymond C. Massner, Holmer Adams, and August Schultz, who shared their knowledge of extremity adjusting and athletic injuries.

The best way to learn is to experience things for yourself. Rugby sounded like a good way to experience things; little did I know that this gentlemen's sport would inflict upon my body nearly the entire repertoire of extremity subluxations.

Frequent visits to Dr. Massner and Dr. Adams for correction of injuries kept me playing rugby and kept me amazed at how a painful and disabling injury could be corrected so easily with such miraculous results.

Through their vision I have come to understand how important extremity adjustments are to maintain spinal adjustments.

Thank you!!! Dr.'s Massner, Adams, and Shultz.

Thank you, Alison Hearon for your love and help while preparing this book.

Agenda

- The Laws of Healing
- T.M.J. What is the Syndrome?
- Superior Lateral T.M.J.
- Anterior Inferior T.M.J.
- RIBS - The Seven Areas of Subluxations.
- S/C - Sternoclavicular Subluxations.
- A/C – Acromioclavicular Subluxations.
- Scapular Adhesions & Subluxations.

LAWS OF HEALING

- PIEZOELECTRIC EFFECT.
- WOLFF'S LAW.
- DAVIS LAW.
- SHERRINGTON'S LAW.
- IF IT'S FIXATED MOBILIZE IT.
- IF IT'S HYPERMOBILE STABILIZE IT.
- ENERGY GOES WHERE ENERGY FLOWS.
- ENERGY STOPS WHERE ENERGY FLOPS.
- MECHANORECEPTOR RESPONSE.

Piezoelectricity From Wikipedia

•Piezoelectricity is the ability of some materials (notably crystals and certain ceramics, including bone) to generate an electric potential in response to applied mechanical stress. This may take the form of a separation of electrical charge across the crystal lattice. If the material is not short-circuited, the applied charge induces a voltage across the material. The word is derived from the Greek *piezo* or *piezein*, which means to squeeze or press.

•The piezoelectric effect is reversible in that materials exhibiting the *direct piezoelectric effect* (the production of an electric potential when stress is applied) also exhibit the *reverse piezoelectric effect* (the production of stress and/or strain when an electric field is applied). For example, lead zirconate titanate crystals will exhibit a maximum shape change of about 0.1% of the original dimension.

•The effect finds useful applications such as the production and detection of sound, generation of high voltages, electronic frequency generation, microbalances, and ultra fine focusing of optical assemblies. It is also the basis of a number of scientific instrumental techniques with atomic resolution and everyday uses such as acting as the ignition source for cigarette lighters and push-start propane barbeques.

Wolff's law From Wikipedia

•Wolff's law is a theory developed by the German Anatomist/Surgeon Julius Wolff (1836-1902) in the 19th century that states that bone in a healthy person or animal will adapt to the loads it is placed under. If loading on a particular bone increases, the bone will remodel itself over time to become stronger to resist that sort of loading. [1]

The external cortical portion of the bone becomes thicker as a result. The converse is true as well: if the loading on a bone decreases, the bone will become weaker due to turnover, it is less metabolically costly to maintain and there is no stimulus for continued remodeling that is required to maintain bone mass.

Davis' Law From Wikipedia

•Davis' Law is used in anatomy to describe how soft tissue models along imposed demands. It is the corollary to Wolff's law. It is used in part to describe muscle-length relationships and to predict rehabilitation and postural distortion treatments as far as muscle length is concerned.
•This is not necessarily describing myohypertrophy (muscle growth) —— the shortening of muscle in response to resistance —— but it explains also how a muscle will lengthen in response to stretching.

•Because most major muscles have an opposite, the protagonistic and antagonistic muscles (and their related synergistic and groups of muscles) will end up reciprocating each other's length. A strong and inflexible gastro soleus complex (calf) will therefore result in a weak and flexible tibialis anterior (shin muscle).

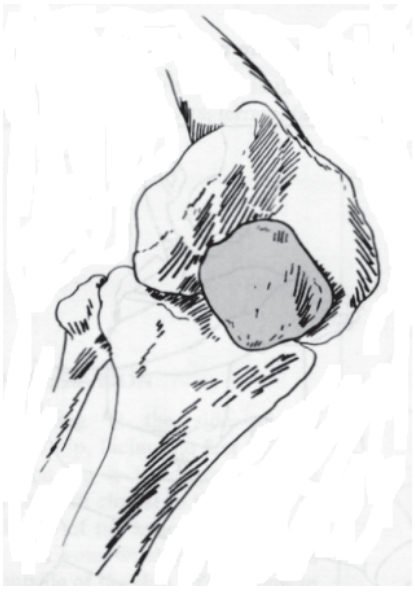
• References: Nutt, John Joseph, *Diseases and deformities of the foot.* New York: E. B. Treat & Co.; 1915, pp. 157-158. (Out of copyright. Available as a pdf in total via Google books).

•Spencer AM, *Practical podiatric orthopedic procedures.* Cleveland: Ohio College of Podiatric Medicine; 1978.

•Tippett, Steven R. and Michael L. Voight, *Functional Progression for Sport Rehabilitation.* Champaigne IL: Human Kinetics; 1995, ISBN 0-873-22660-7, p. 4.

IN REVIEW THESE LAWS STATE THESE 3 THINGS.

The ability of material to generate an electric potential in response to applied mechanical stress

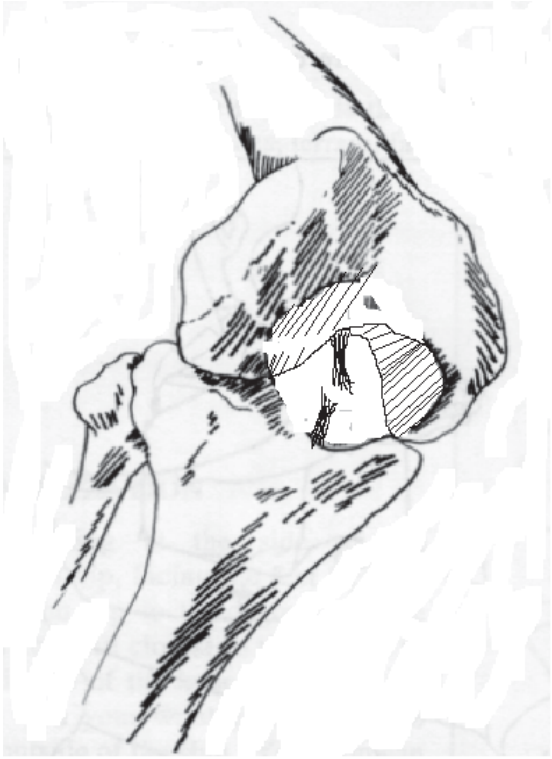


Bone will adapt to the loads it is placed under.

Soft tissue models along imposed demands.

THERFORE TISSUE HEALS AND ADAPTS THROUGH POLARITY GENERATED BY LOAD AND MOTION.

The ligament poles sense their direction and align the fibers to reconnect one fragile fiber at a time until the whole ligament is complete.
This process can take up to three months to complete the healing.



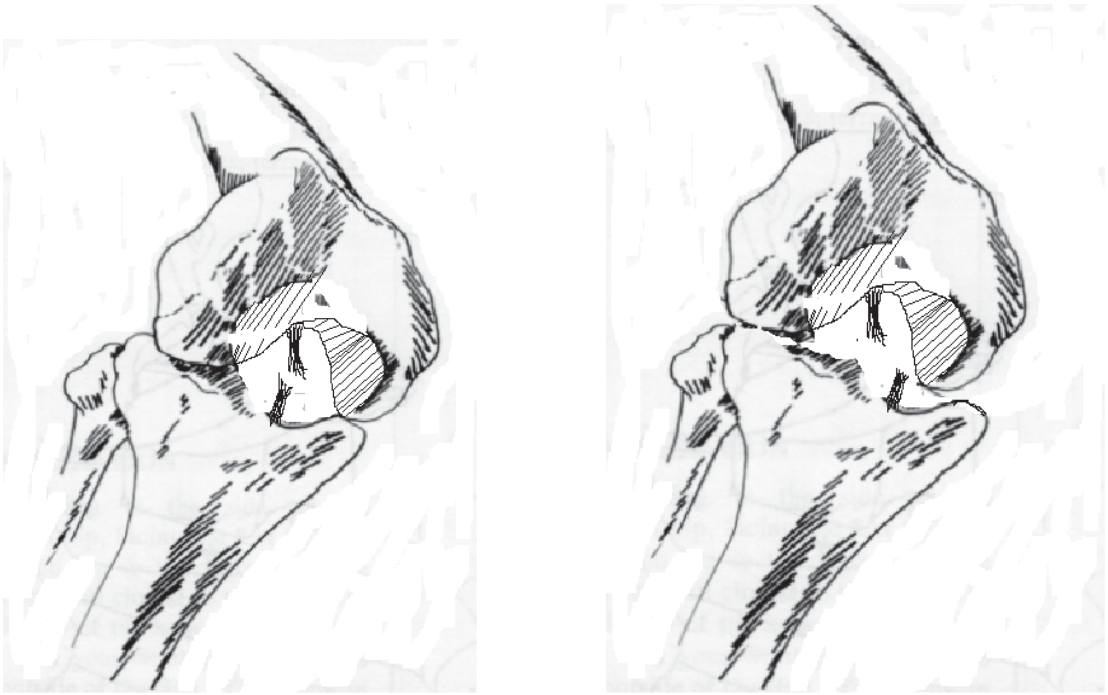
THE NUMBER ONE PROBLEM THAT GETS IN THE WAY OF THIS HEALING IS;

DOCTORS

Doctors are taught to perform objective tests on patients each visit (like an anterior drawer test) to justify their procedures and treatment plan. They follow the SOAP format – Subjective, Objective, Assessment, Plan.

Doctors tear these fragile fibers unwittingly and therefore believe they don’t heal.

Anterior drawers test tears fragile new fibers.



PROPER PROTOCOL FOR LIGAMENTS

This is the application of the laws of healing.

Adjust the joint to restore normal relationship so the tissues heal in the normal tight position instead of stretched and elongated ligament position.

Stabilize the joint with taping, supports or bracing to prevent it from moving out of its normal physiologic envelope.

Allow motion through the non-painful range of motion which stimulates the polarity for the tissues to heal in the correct direction.

SHERRINGTON'S LAW

Sherrington's law of reciprocal innervation states that muscle inhibition usually generates hyper tonicity/tightness in antagonist muscles, and that the relationship between weak and tight muscles is reciprocal, with inhibition producing the same influence on their antagonist muscles as tightness.

Dynamic Chiropractic – March 26, 2010, Vol. 28, Issue 07
Muscle Imbalance: The Goodheart and Janda Models
By Scott Cuthbert, BA, DC, BCAO

Sherrington advises that "Knowledge of reflex inhibition equally with that of reflex excitation is essential for the study of nervous co-ordination." This means that abnormal muscle inhibition is as neurologically important as over-facilitation in patients with pain and dysfunction.

Dynamic Chiropractic – March 26, 2010, Vol. 28, Issue 07
Muscle Imbalance: The Goodheart and Janda Models
By Scott Cuthbert, BA, DC, BCAO

George J. Goodheart Jr., DC (1918-2008) and Vladimir Janda, MD (1923-2002) influenced generations of practitioners spanning many disciplines. One difference between Goodheart's approach (a chiropractor) and Janda's (a physical therapist) is that muscle inhibitions are identified and treated first with chiropractic manipulative therapy (CMT).

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IF IT'S FIXATED MOBILIZE IT.

- A fixated joint has limited motion and does not glide through it's normal physiologic envelope.
- This may be due to joint adhesions or mechanoreceptor inhibition of adjacent muscles.
- Adjustments (manipulation) frequently will restore motion and mobility.

IF IT'S HYPERMOBILE STABILIZE IT

- A hypermobile joint has excess motion outside of it's normal physiologic envelope.
- This may be due to trauma or long term stretching of the ligaments in the joint that have healed in a pathological position.
- Stabilizing the joint with taping, supports or bracing within its normal motion is essential.

ENERGY GOES WHERE ENERGY FLOWS

- Where there is stress/friction over time there is a build up of tissue. (e.g. Calluses, increased bone mass or growth, increased muscle mass).
- If you show me a way to irritate the periosteum, I'll show you a way to grow bone. (Russel Erhardt)

ENERGY STOPS WHERE ENERGY FLOPS.

- Where there is no stress/friction over time there is a lack of build up of tissue, (eg. Baby skin, decreased bone mass and muscle mass, fat deposits).
- Take a look at yourself and check out where the fat is. How much do you exercise that area? Energy is stopping and flopping there.

TYPICAL MECHANORECEPTORS IN A JOINT

(3, pp. 799-802; 4, pp. 225-235)

At the heart of this book is one consistent underlying principle of testing and retesting which depends on sensory input from mechanoreceptors. Most of us learned about them, but few of us learned to apply this knowledge in a practical way. In an effort to simplify how they work and in what tissues they are located, I have prepared a special drawing.

You can observe just how this looks in an illustration on the adjacent page. Mechanoreceptors when activated under extreme conditions *inhibit* adjacent muscular activity. I wish to emphasize the phrase "UNDER EXTREME CONDITIONS", i.e. of strain, especially sprain, and the word "INHIBIT" adjacent muscular activity. The typical muscle adjacent to a strain or sprain will lessen in strength from a grade 5 to a grade 3 or less.

Let's move along in a certain order here because I think that it helps the understanding of what mechanoreceptors do all through the body in every synovial joint as they inhibit adjacent muscular activity when taken beyond the normal physiological envelope of function.

Pain

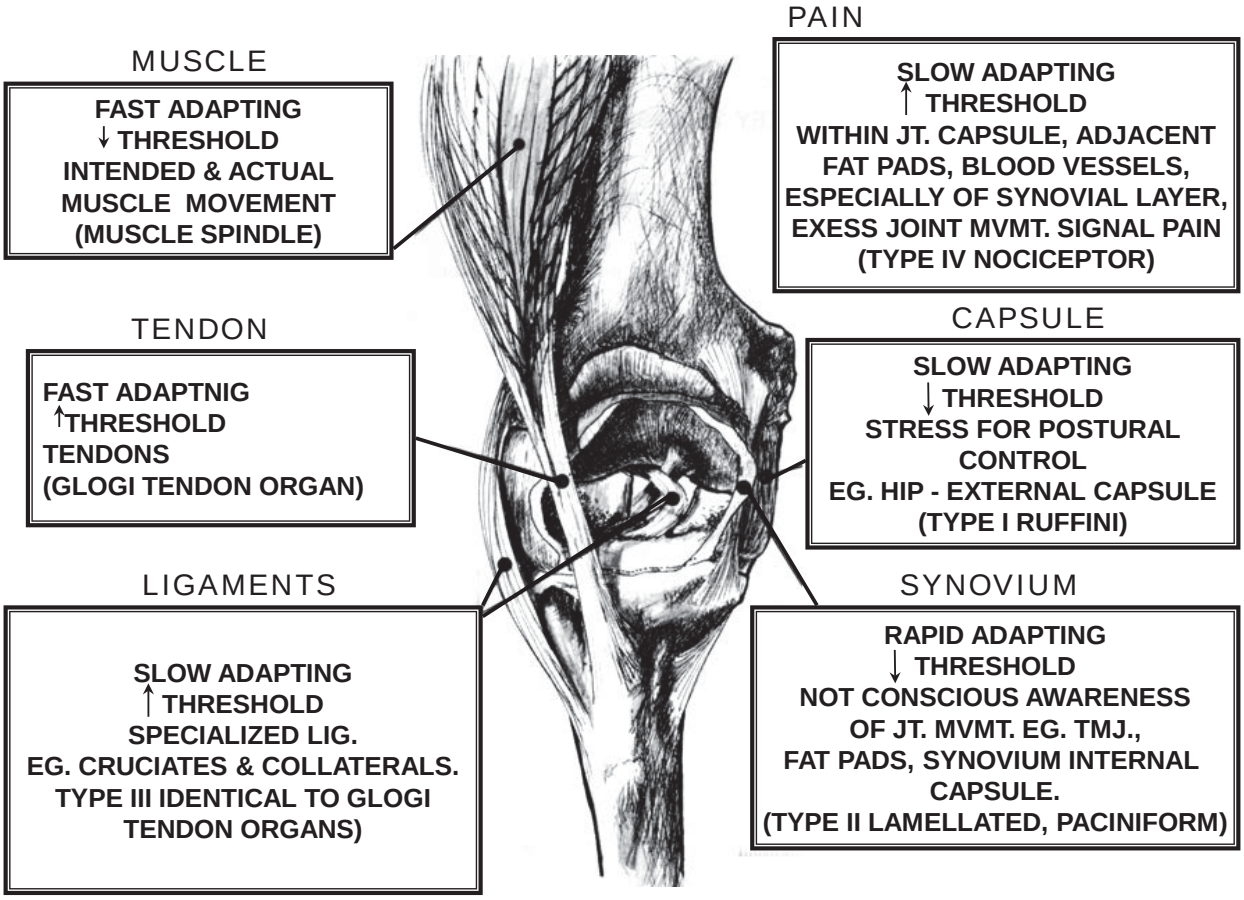
First, let's go to the pain receptors. You'll see that they are very slow adapting but high threshold mechanoreceptors. Slow adapting is defined as being very slow to reduce and stop the signaling of pain and high threshold is defined as taking a strong force to make it respond or activate and reach threshold level of activation of the mechanoreceptor. It is located within the joint capsules, the adjacent fat pads, the blood vessels (especially of the synovial layer) and has to do with excess joint movement and the signaling of joint pain. It is called the Type 4 nociceptor. A side story that you can probably relate to is, when you were a child, you put your finger on the hot burner or over a hot flame, when your mother or father told you not to do it. You probably noticed that when you did this the first time, you had your finger on there a short while before the pain started. This is because a nociceptor is the smallest diameter nerve fiber in the body, somewhere around only five microns. As a result it is also the slowest transmitting nerve fiber. So, when you put your finger on the burner, by the time you felt the pain the tissues were already burned and the pain stayed for a considerable time. Another example may be when you had injured yourself at some time. You recall seeing the injury happen, seeing the joint move or feeling it go in an odd direction but not feeling the pain right away. The pain didn't come on until later. An injured joint will persistantly cause disturbed sensory feedback from the joint to the central nervous system and existing motor programs have to be modified in accordance with the new sensory situation. Pain is a physiologic restrictive barrier to motion.

Capsule

The next mechanoreceptor in the capsule is a slow adapting and low threshold receptor. It is both static and dymanic and has to do with stress for postural control. It is located in areas like the hip, in its external capsule. It is good that this particular mechanoreceptor is very slow adapting with a very low threshold because it is the only receptor that gives us conscious proprioception of our joints. Since it is very strong, we don't want it to inhibit muscles and alter the motor programing until it reaches the point of where it is about to be damaged. This is called the Type 1 Ruffini.

Synovium

The next mechanoreceptor is very different from the previous two. It is very rapid adapting but low threshold. Rapid adapting means it is very quick to respond once the stimulus is given and quickly fades. Low threshold means that it takes very little stimulus to make it respond. So it is a very highly sensitive, alert type of mechanoreceptor but it doesn't have to do with the conscious awareness of joint movement as such. It is located in places like the T.M.J., the fat pads of the joints, synovium and internal capsule. It is called the Type 2 lamellated and paciniform receptor. Being highly sensitive to the internal capsule and the synovium, it combined with your nociceptor or pain receptor, creates what people feel when there is weather change or a barometric drop in pressure. During good weather you have a normal internal pressure to the synovial cavity. When the barometer drops, that pressure pushes out from the inside into the synovium and capsule and stimulates these mechanoreceptors and also, at the same time, the pain receptors. That's why many peoples' joints ache when a storm front is coming in.



Ligaments

Moving along now to the ligaments we see that the mechanoreceptor there is a very slow adapting and high threshold mechanoreceptor that's involved in specialized ligaments. These ligaments being the cruciate ligaments and collaterals. Note that this particular mechanoreceptor is a Type 3 and it is identical to the golgi tendon organs. I think that it is appropriate to take a look at the golgi tendon organ on this next illustration. It is important to note that these Type 3 receptors are not found in the spine. These are responsible for long term inhibition of muscles.

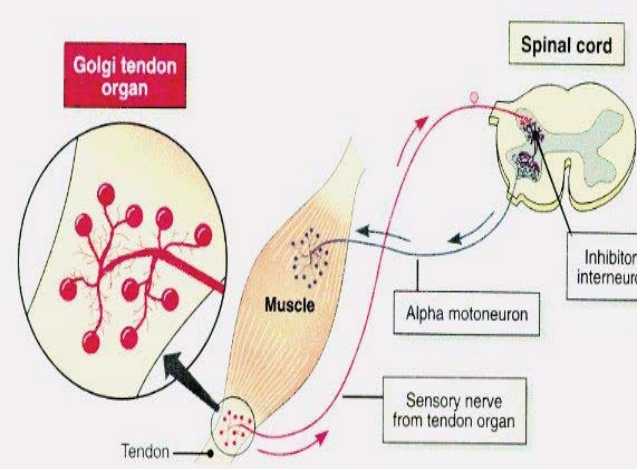
Golgi Tendon Organ

Golgi tendon organs are chiefly found near the junctions of tendons or muscles and the endings are highly active when tendons are stretched either actively or passively and initiate a myotactic reflex (muscle contraction reflex) which inhibits the development of excessive tensions during muscular contraction. Evidence indicates that as tension develops in the tendon the sensory endings may be deformed by the surrounding collagen fibers which become more parallel and closer together and initiate the response.

Golgi Tendon Organs

Mechanoreceptor circuit

- Reflex circuit that inhibits adjacent muscle activity
- Misalignment irritates soft tissue
- Afferent signal determines efferent response.

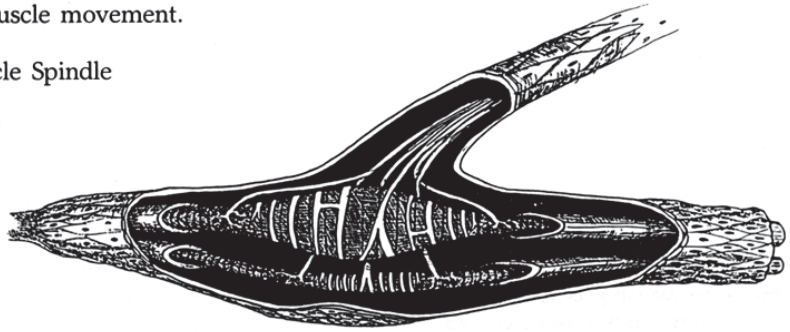


Taken from Global Extremity Assessment; John Downes, D.C., CCEP

Muscle Spindle

This particular mechanoreceptor is very interesting. It is very fast adapting with a low threshold; meaning, it is quick to respond and doesn't take a lot of force to do so. It has to do with intended and actual muscle movement.

Muscle Spindle



The activities of a spindle appear to provide information on the length of the extra fusal muscle, it's velocity of contraction and changes in velocity. The fusimotor fiber can adjust the length of the intrafusal fiber and therefore the activity of its sensory fibers by causing the polar regions to contract. This means that it recruits adjacent muscle fibers to create the strength necessary to handle the stress. This is called autogenic excitation.

The spindle probably monitors the extent of muscle contraction allowing comparisons to be made between intended and actual movements, this means between intrafusal and extrafusal muscle fibers. The muscle spindle is reliant on the golgi tendon organ for its inhibitory response.

In review now let's go back to the major heading of ''Typical Mechanoreceptors in a Joint'' under which it states, ''mechanoreceptors when activated under extreme conditions inhibit adjacent muscular activity''. I want to reemphasize ''INHIBIT''. This particular activity is a function of mechanoreceptors. They do allow other functions to occur under normal stresses. Therefore, an understanding of why the muscles do become weak and why they increase in strength so dramatically when an adjustment is given, is of great importance. Adjustments relieve the stretch in the joint. Pain (type IV nociceptor), ligament (type III) and golgi tendon organ are the long term inhibitors in a joint.

LAWS OF EXTREMITY ADJUSTING

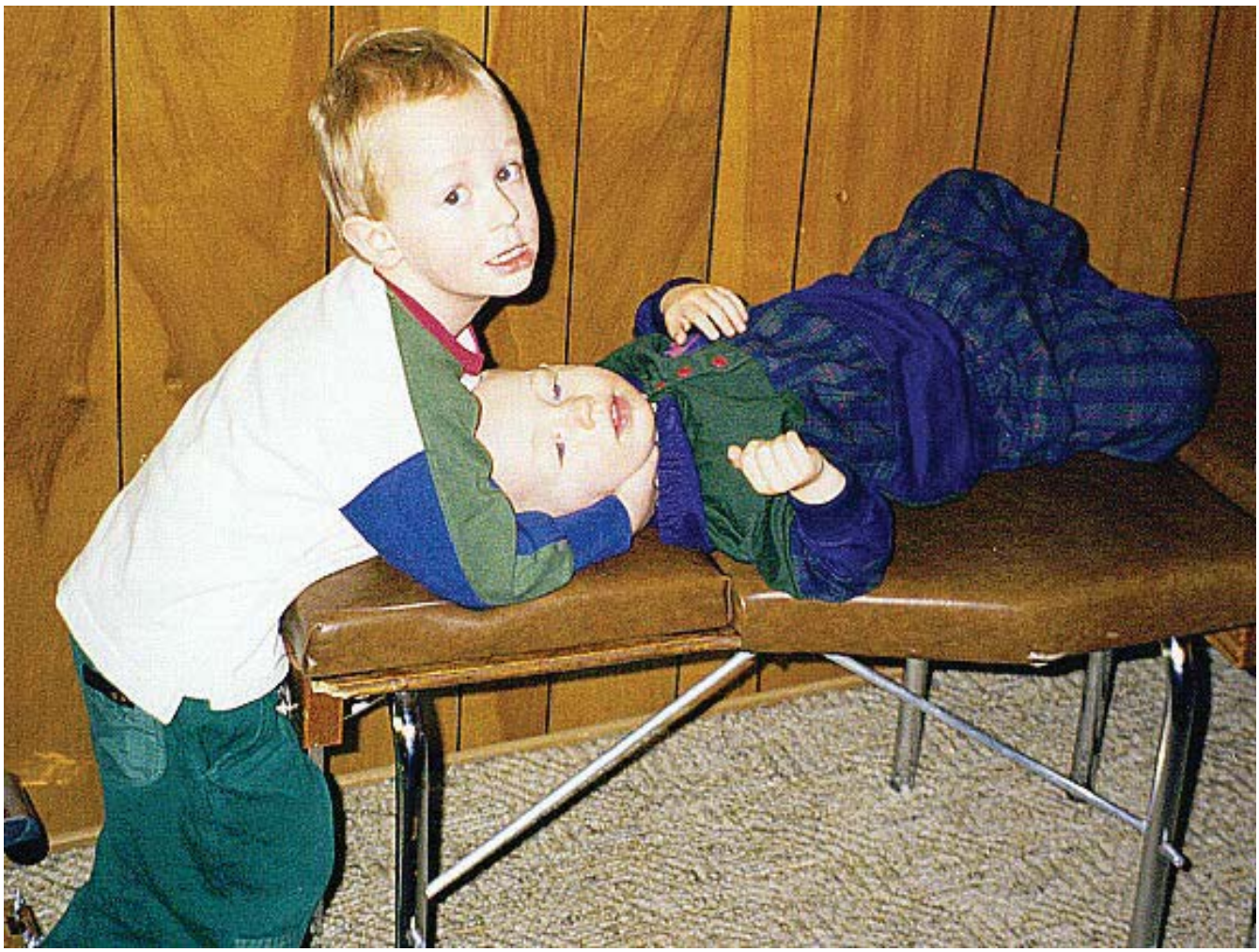
1. SEGMENTS MISALIGN TO THE PROXIMAL SEGMENT

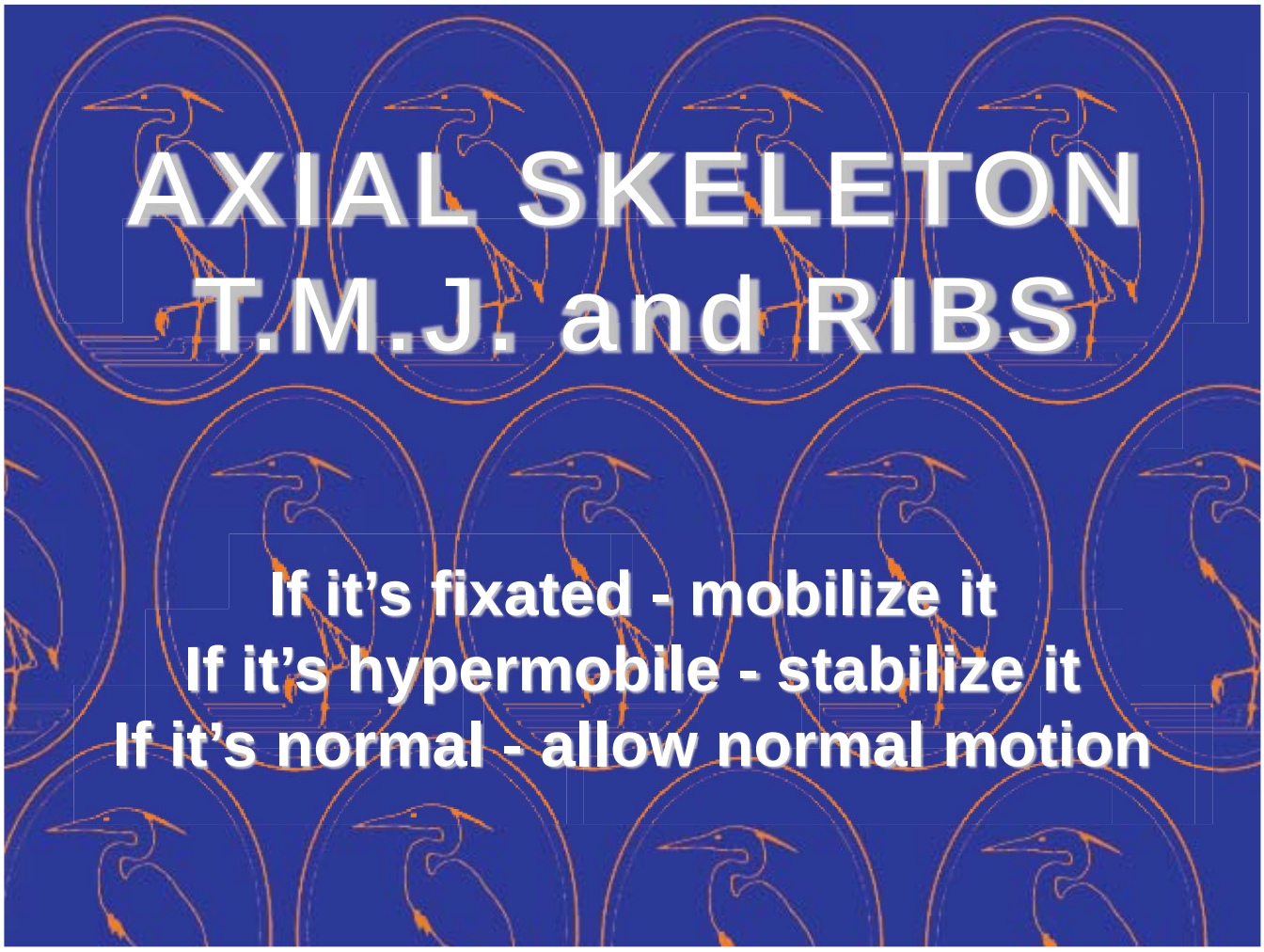
2. THE PROXIMAL SEGMENT IS THE BASE FOR THE DISTAL SEGMENT'S ALIGNMENT

3. SEGMENTS ARE ADJUSTED AT THEIR PROXIMAL END (Exception - a/c [acromio clavicuar] articulation)

4. IN THE CASES OF MULTIPLE MISALIGNMENTS IN THE SAME EXTREMITY PROGRESSIVELY ADJUST FROM PROXIMAL MISALIGNMENT TO DISTAL MISALIGNMENT

These laws were formulated to have a standard base from which you can approach extremity adjusting. They were designed to eliminate the confusion of the novice as to which segment to adjust when approaching a new spontaneous extremity problem that is not covered in this book.





Whiplash May Produce Delayed Jaw Pain

Science Daily — One in three people exposed to whiplash trauma is at risk of developing delayed TMJ symptoms that may require treatment, according to research published in the August 2007 issue of The Journal of the American Dental Association.

Researchers at Urea University, Sweden, studied short- and long-term temporomandibular joint (TMJ) pain and dysfunction in 60 patients in hospital emergency rooms directly after they were involved in a rear-end car collision and evaluated them again one year later.

According to the study, the incidence of new symptoms of TMJ pain, dysfunction or both between the initial examination and follow-up was five times higher in subjects than in uninjured control subjects. In the year between the two examinations, 7 percent of control subjects developed symptoms in the TMJ versus 34 percent of study subjects.

Continued

According to the American Dental Association, the TM joint is one of the most complex joints in the body. Located on each side of the head, these joints work together and can make many different movements, including a combination of rotating and translocational (gliding) action, used when chewing and speaking. Any problem that prevents this system of muscles, ligaments, discs and bones from working together properly may result in a painful TMJ disorder.

When the patients reported having symptoms in the TMJ either before or after their accidents or both, the authors evaluated symptoms, including clicking, locking and TMJ pain. They also asked patients to rate their pain intensity and report the degree to which symptoms interfered with their daily lives, including sleep disturbances, use of pain relievers and the need to take sick leave.

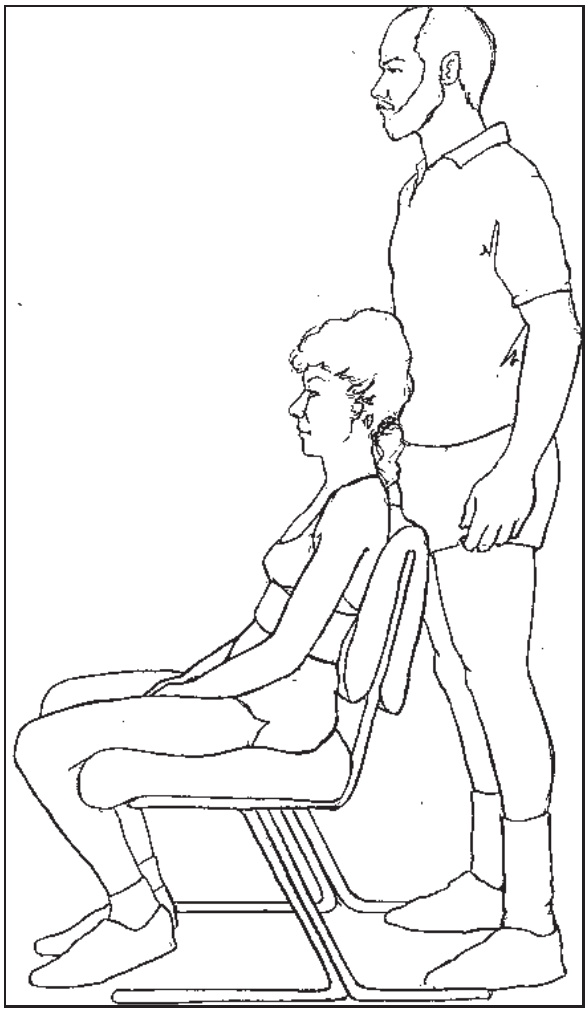
"One in three people who are exposed to whiplash trauma, which induces neck symptoms, is at risk of developing delayed TMJ pain and dysfunction during the year after the accident," the researchers concluded.

Note: This story has been adapted from a news release issued by American Dental Association.

T.M.J.

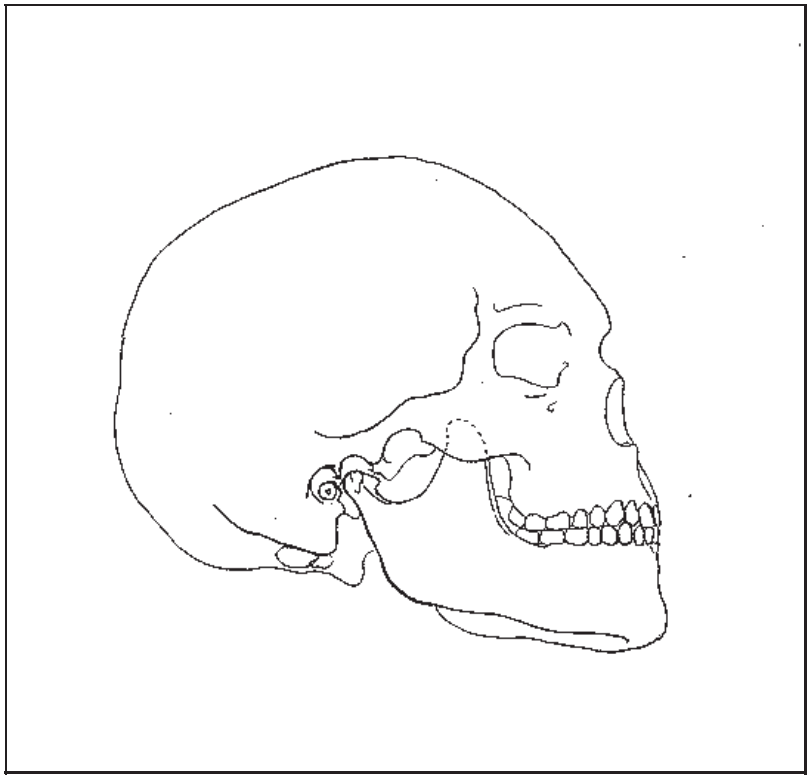
TEMPORAL MANDIBULAR JOINT

- Two separate synovial joints with discs that control mastication by hinging and gliding through three plain lines of motion when working normally. They rely on optimal teeth size, position and occlusal surface alignment.



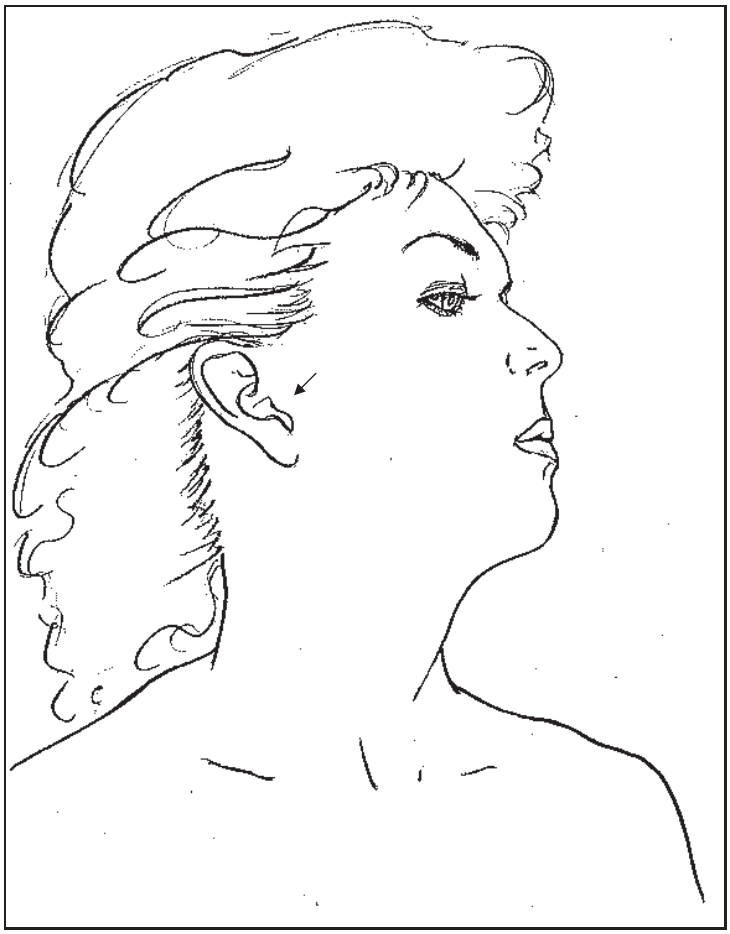
DOCTOR PATIENT POSITION

The patients EOP (external occipital protuberance) should be at the level of the navel on the doctor. This allows visualization of the mandible in relation to the tip of the nose of the patient.



LOCATION

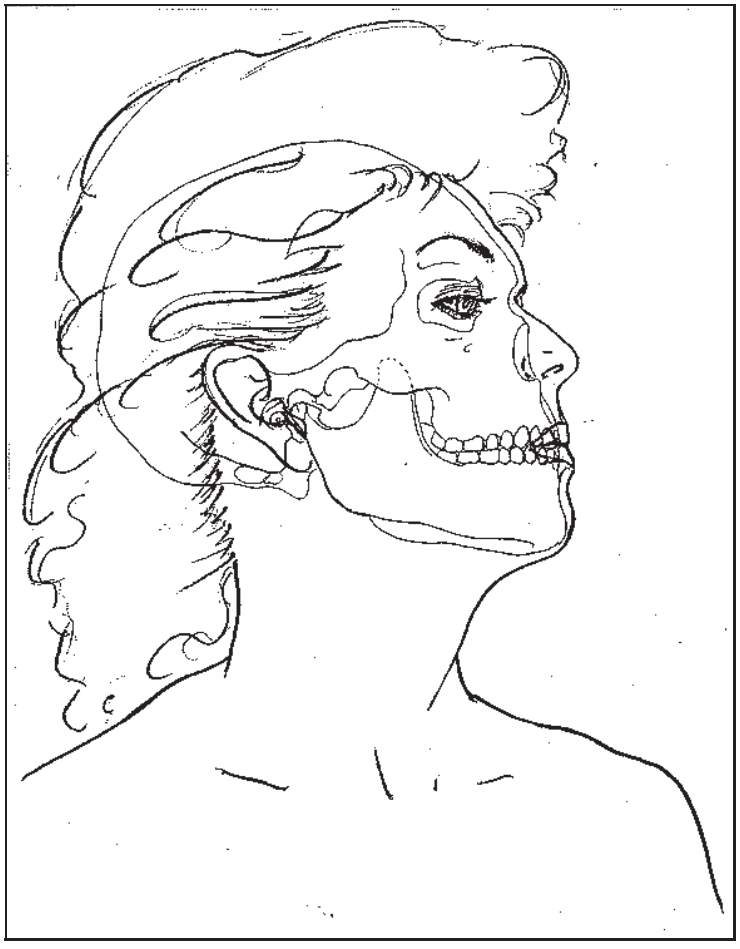
On the skull the TMJ is located in front of the external auditory meatus.



The right TM joint as seen from the outside.

Note the soft tissue flap in front of the external auditory canal called the tragus.

This is where you can feel the TM joint when opening and closing the mandible.



Both illustrations super imposed for clarity of position

If you place your finger in front of the tragus of each ear you can palpate the closed TMJ.

Now open the mouth slowly and feel the finger fall into the glenoid fossa. If you do this bilaterally they should open at the same time. If one finger falls in sooner you should note how the mentum of the mandible deviates to the left or right. The finger falling in second is usually the involved side and the side the jaw initially deviates toward.

Avoid pressing firmly into this fossa due to patient sensitivity. Ask them if there is pain and which side is it on or both.

Quintessence Int. 2011 Jan;42(1):e1-e14.

Whiplash-associated disorders and temporomandibular symptoms following motor-vehicle collisions.

Epstein JB, Klasser GD.

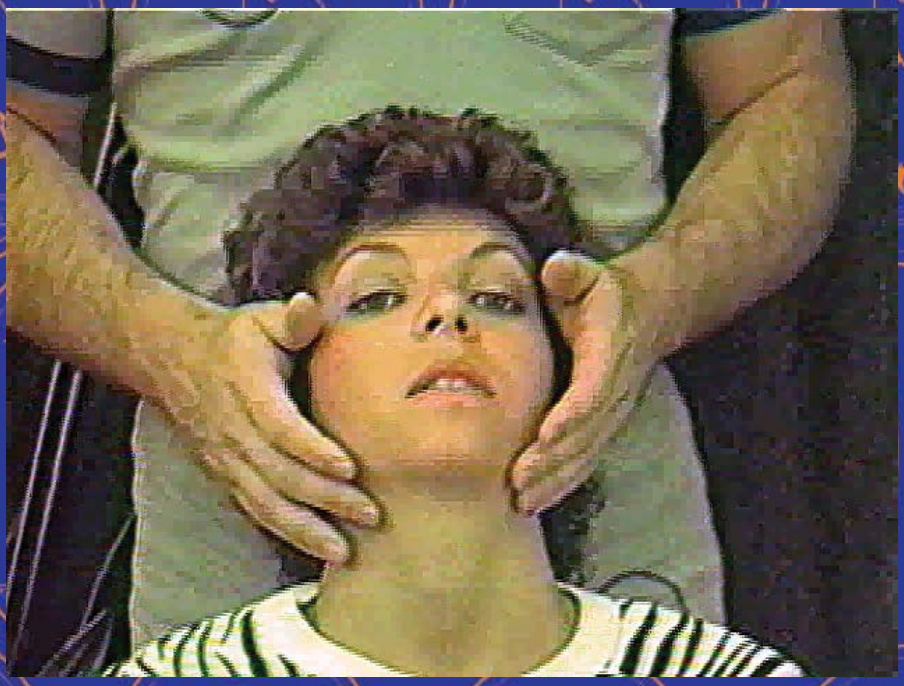
Source

Department of Oral Medicine and Diagnostic Sciences, College of Dentistry, University of Illinois at Chicago, Illinois, USA. jepstein@uic.edu

Abstract

Recent research has shown that temporomandibular symptoms may be associated with or occur independently of whiplash-associated disorders related to motor-vehicle collisions. A PubMed/Medline search was conducted using the terms "temporomandibular disorders," "orofacial pain," "temporomandibular joint," "whiplash," and "whiplash-associated disorders and motor-vehicle accidents and motor-vehicle collisions" for the years 1995 to 2009. Systematic reviews, meta-analyses, and clinical studies were included if they addressed temporomandibular disorders, whiplash epidemiology, diagnosis, and prognosis. References in the selected articles were also reviewed (including those prior to 1995) if the articles specifically addressed the topic. An evidence base was established for general outcomes using the Oxford Centre for Evidence-Based Medicine Levels of Evidence. Temporomandibular symptoms may develop following motor-vehicle collisions and be more complex, representing a component of a symptom cluster of potentially regional and widespread pain impacted by psychosocial factors. Oral health care providers must be aware of the relationship between temporomandibular symptoms,whiplash-associated disorders, and trauma and the more complex nature of the symptoms for appropriate diagnosis and management.

Left Right



TR-2

TRANSLATION

Translation strength is tested with the face looking straight ahead and pulling posterior on the anterior projected mentum.

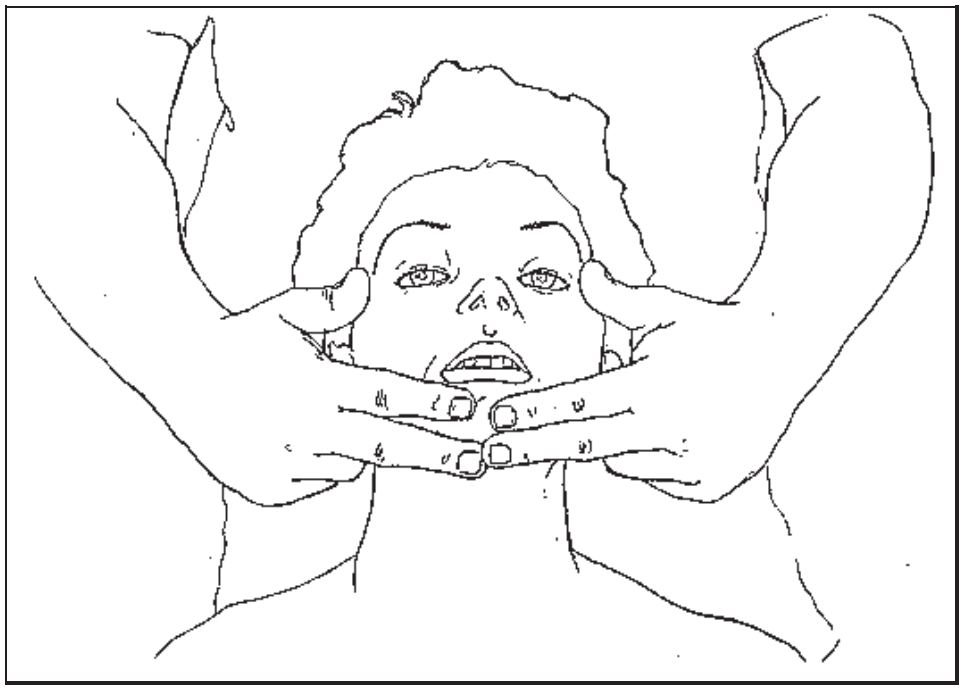
Note which side is weak because the mentum of the mandible will move toward that side when testing.

Also look for bilateral weakness of translation. This motion along with opening are frequently less exercised unless a helmet chin strap has forced these motions into use.

Therefore the TMJ is one of the most muscularly imbalanced areas in the human body.

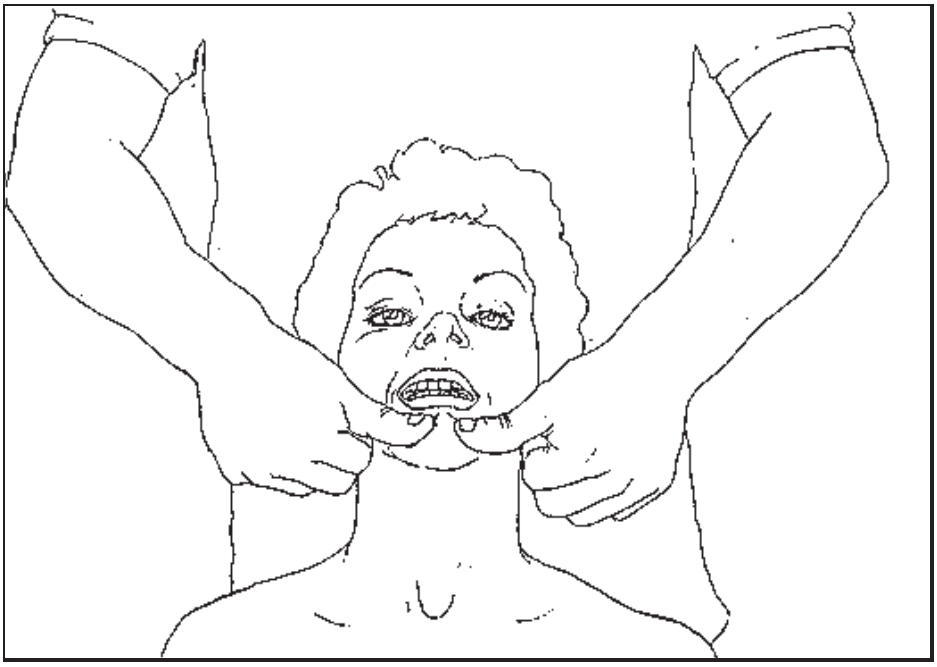
How many trainers teach you jaw exercises?

TRANSLATION

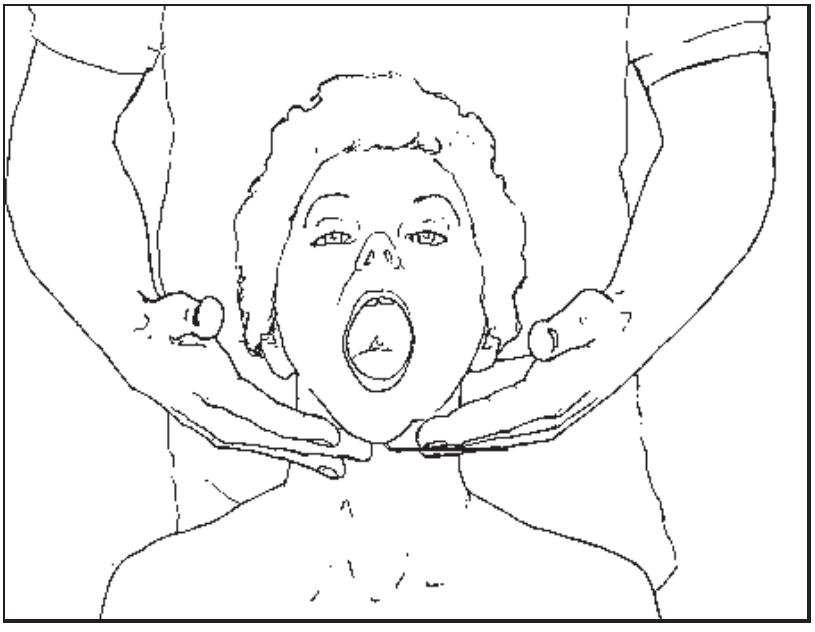


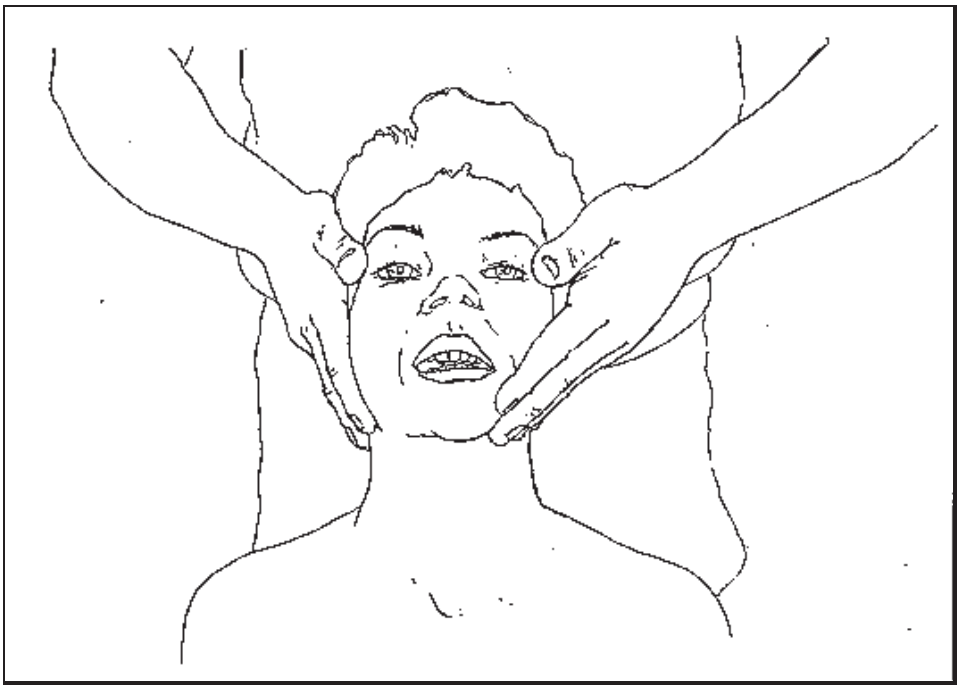
Utilization of the index and middle fingers to pull straight posterior is optimal in the adult and offers a broader surface area for comfort to the patient. It also prevents excessive pressure by the doctor during the test.

CLOSE - To perform the closing muscle test start with the patients teeth together and place you distal thumbs on the superior mentum of the mandible below the lower lip. Have the patient clench their teeth and resist your inferior pressure. This is also a good time to palpate the superficial muscles of mastication for tonicity at the sides of the mandible and skull.

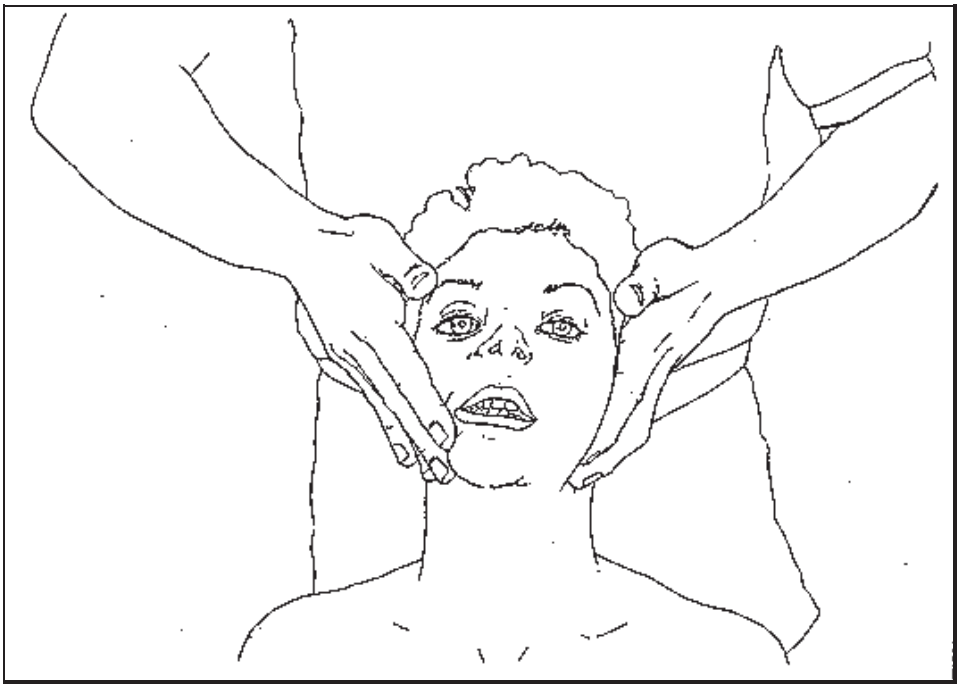


OPEN - When muscle testing the mandible it is to be remembered that this is not a contest and we are to only feel the strength of the patient to determine if the strength is consistent with other muscles. Allow the patient to open their mouth fully and then place multiple finger tips under the mentum and lift. Avoid using your palm or proximal phalanges as this may over power the patient and strain the jaw muscles.





LEFT LATERAL FLEXION - is tested with finger tips and if you use the tip of the nose as a site you can compare the lateral deviation of one side to the other. Note which side is limited compared to the other and document it in your records.



RIGHT LATERAL FLEXION - Comparing deviation to the right and muscle testing with the finger tips can give you a good idea of the restriction involved in this plane line. Usually the side with greater motion is the involved side because the opposite side disc is not impeding the condyle forward glide.

J Can Dent Assoc. 2010;76:a172.

Orofacial injuries due to trauma following motor vehicle collisions: part 2. Temporomandibular disorders.

Epstein JB, Klasser GD, Kolbinson DA, Mehta SA.

Source

University of Illinois at Chicago, Chicago, Illinois, USA. jepstein@uic.edu

Abstract

Temporomandibular disorders (TMDs) following motor vehicle collisions (MVCs) may result from direct orofacial trauma but also occur in patients with whiplash-associated disorder (WAD) without such trauma. TMDs may not be identified at the time of first assessment, but may develop weeks or more after the MVC. TMDs in WAD appear to occur predominantly in females and can be associated with regional or widespread pain. TMDs following MVCs may respond poorly to independent therapy and may be best managed using multidisciplinary approaches.

12 MAJOR SIGNS AND SYMPTOMS OF T.M.S.

You must have 3 or more signs to have T.M.S. diagnosis

1. Pain at T.M.J.
2. Crepitus in T.M.J.
3. Bruxism - grinding teeth especially at night
4. Inability to open mouth wide - 3 fingers in mouth
5. Inability to close teeth together - front, back or side
6. Headaches
7. Neck aches
8. Tinnitis - ringing of ears (with dizziness)
9. (W) (V) Pattern/Tracking deviation
10. Chronic recurring cervical subluxations
11. Muscle weakness during R.O.M.
12. Occular dysfunction

BIOMECHANICS OF BILAMINAR DISC

1. Glides forward with opening and inferior
2. Glides superior and posterior with closing

Finger in glenoid fossa - which finger falls in first

HNO. 2008 Nov;56(11):1114-21.

[Temporomandibular joint dysfunction. A consequence of whiplash-injury]. [Article in German]

Hülse M, Losert-Bruggner B.

Source

Abteilung Phoniatrie, Pädaudiologie, Neurootologie, Univ.-HNO-Klinik Mannheim, 68135 Mannheim, Deutschland. manfred.huelse@hno.ma.uni-heidelberg.de

Abstract

BACKGROUND:

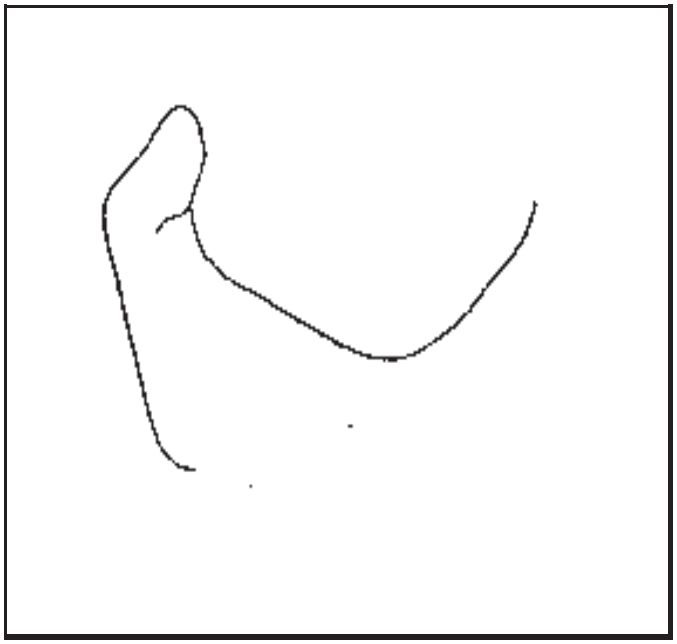
In 10-20% of patients with a simple whiplash-injury without severe structural lesions, a chronification of the complaints occurs. The question is whether some unidentified pathogenic factors exist.

QUESTION:

Investigations have demonstrated that mandibular and head-neck movements are coordinated and centrally controlled and that a craniocervical dysfunction (CCD) can lead to a temporomandibular dysfunction (TMD) by reflex action and vice versa. This study investigated whether a whiplash-injury can lead to a TMD.

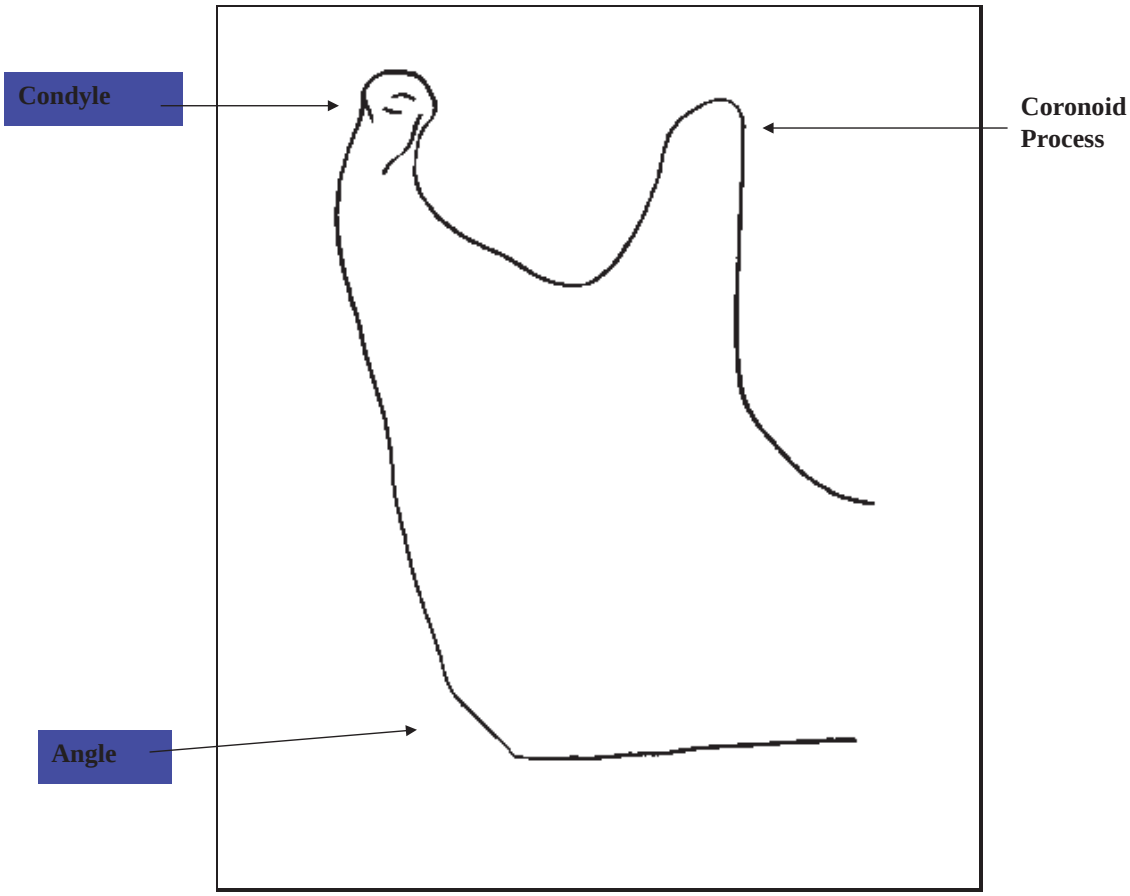
METHODS AND RESULTS:

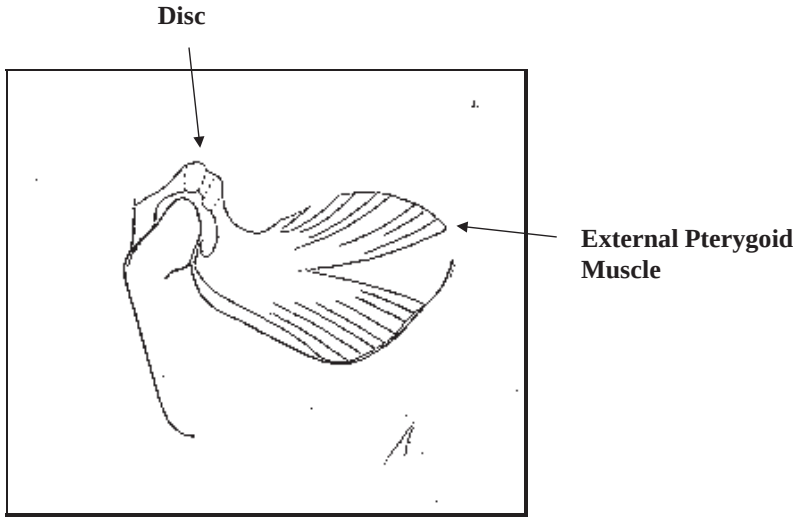
A total of 187 patients with whiplash-associated disorders (WAD) were examined for TMD. Simple tests with and without loading of the mandible were used to initially diagnose TMD and the diagnosis was confirmed electrophysiologically. TMD could be verified in all patients with WAD.

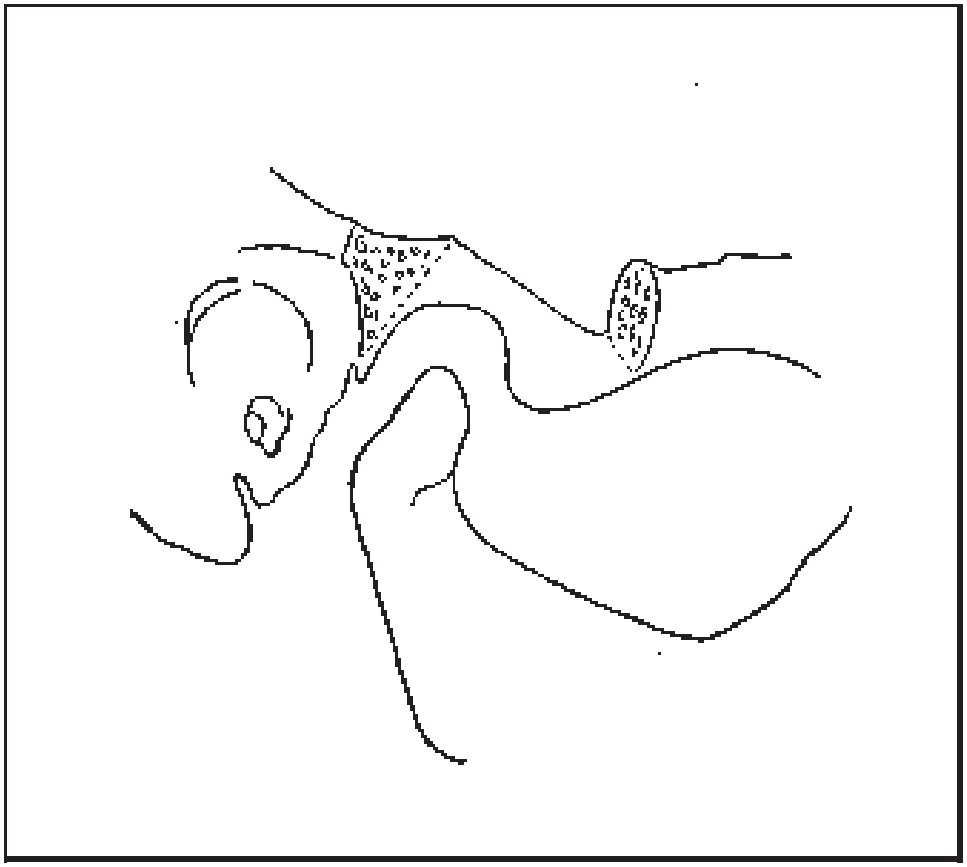


PROGRESSIVE MANDIBULAR ANATOMY

Shapes vary in individuals at the TM joint and yet share a commonality of function.


Condyle
Coronoid Process
Angle


Disc
External Pterygoid Muscle

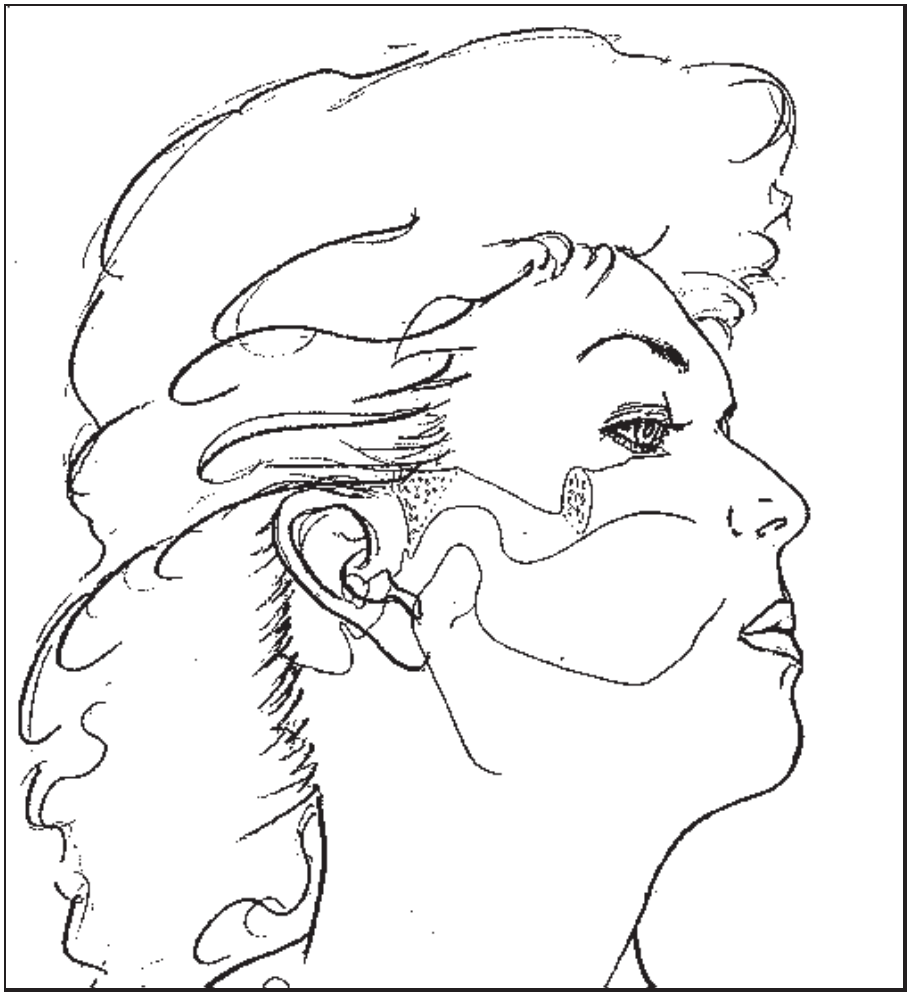


Note the equal spacing surrounding the condyle of the mandible in the glenoid fossa. This is known as;

NEUTRAL POSITION

It is neither in flexion or extension, superior or inferior, anterior or posterior.

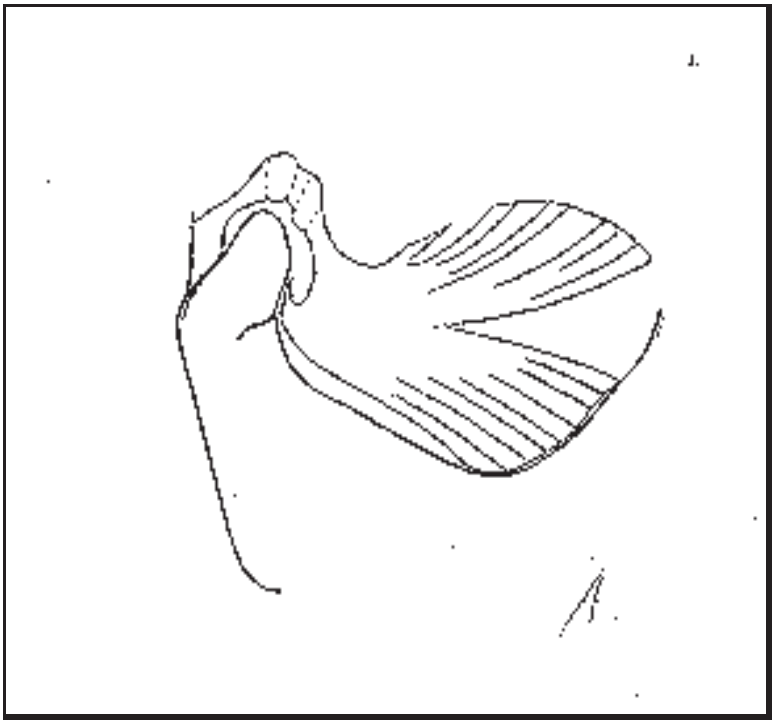
It is neutral.



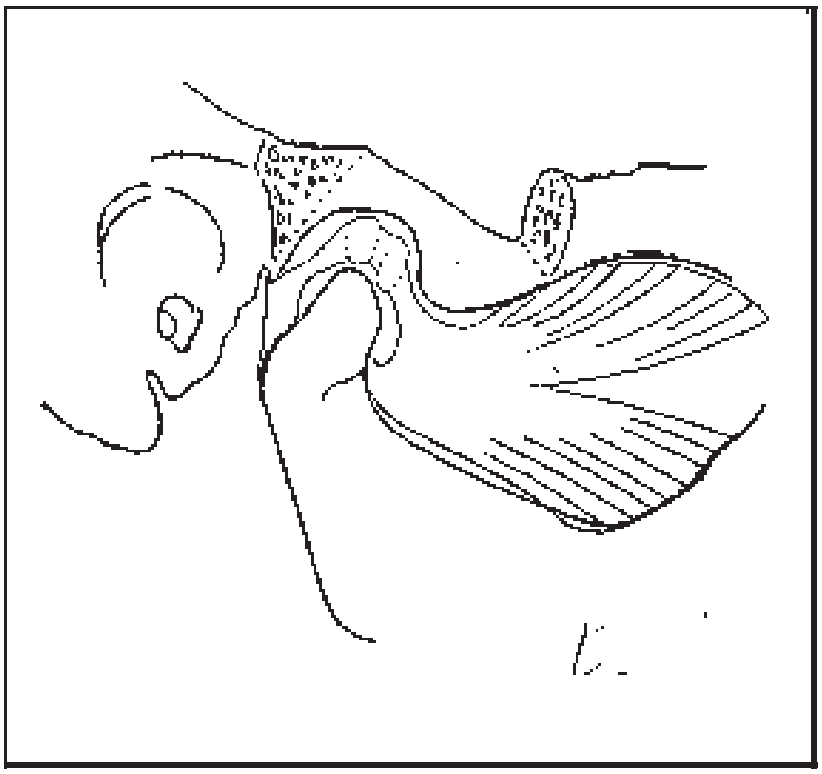
NEUTRAL POSITION - As it may appear in a relaxed jaw position.

Would teeth height and position affect the position of the condyle in its fossa?

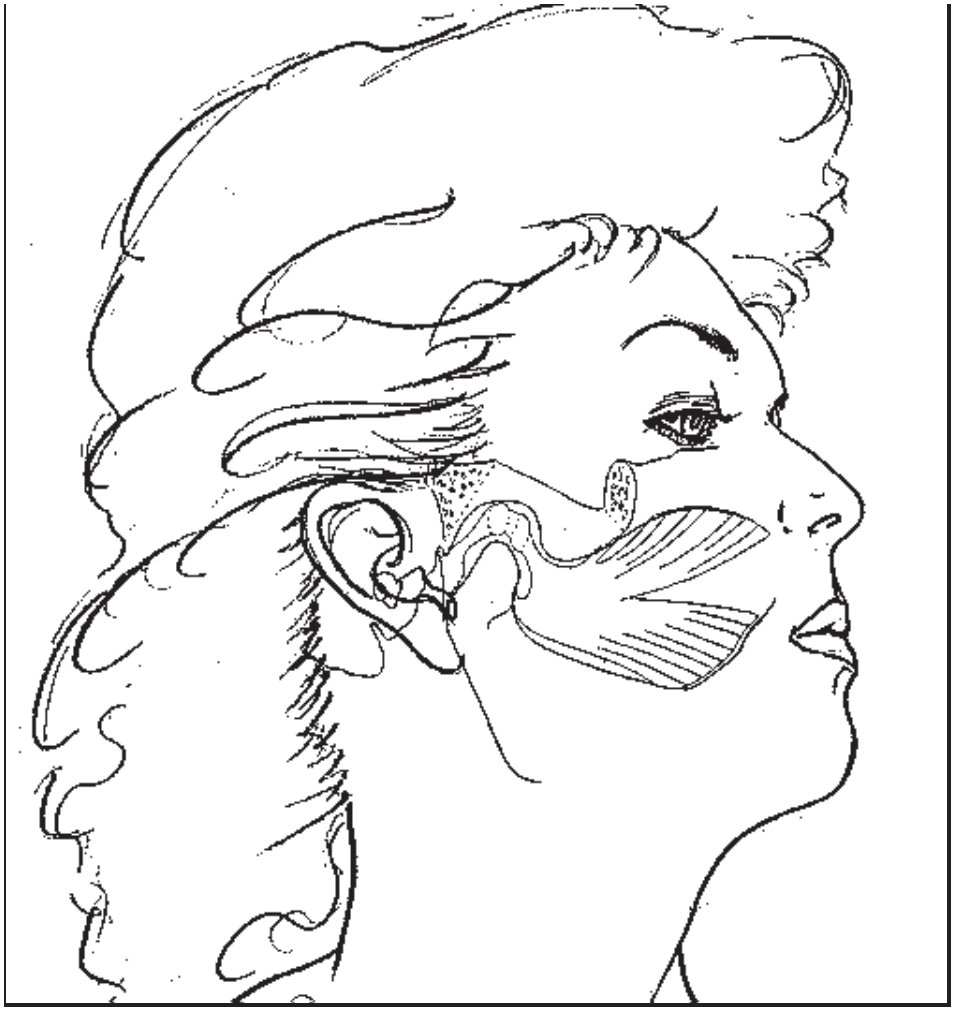
NORMAL TMJ AND ATTACHMENT SITES TO DISC



With space at a minimum between the two bones, the bilaminar disc, ligament and tendon are literally between a “rock and a hard place” with very limited space to function.



Trauma to the mandible gets translated into these confined tissues rather readily.

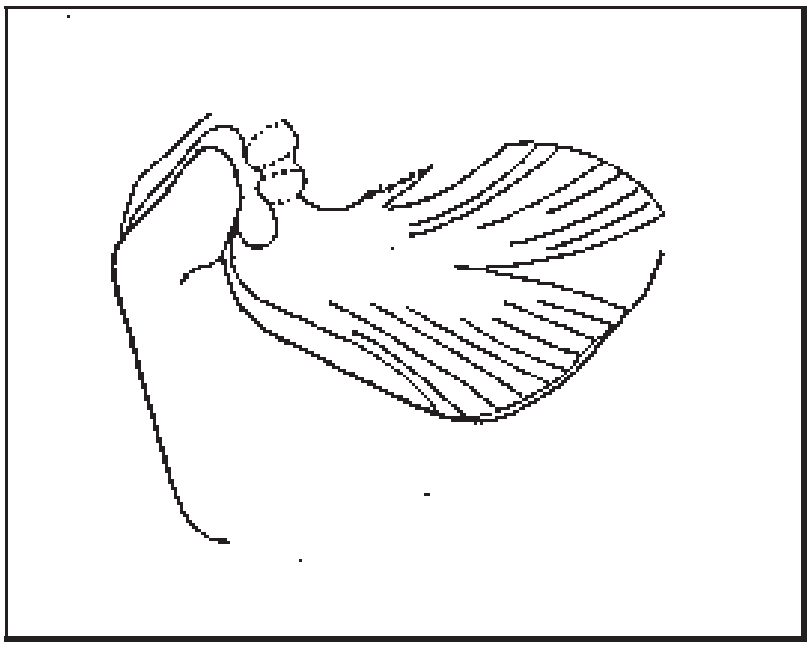


The painful proximity of the TMJ to other structures may create confusion as to it's origin.

It may be thought to be an ear infection, headache, toothache, C-1 subluxation or sinus infection.

SUPERIOR POSTERIOR LATERAL TMJ

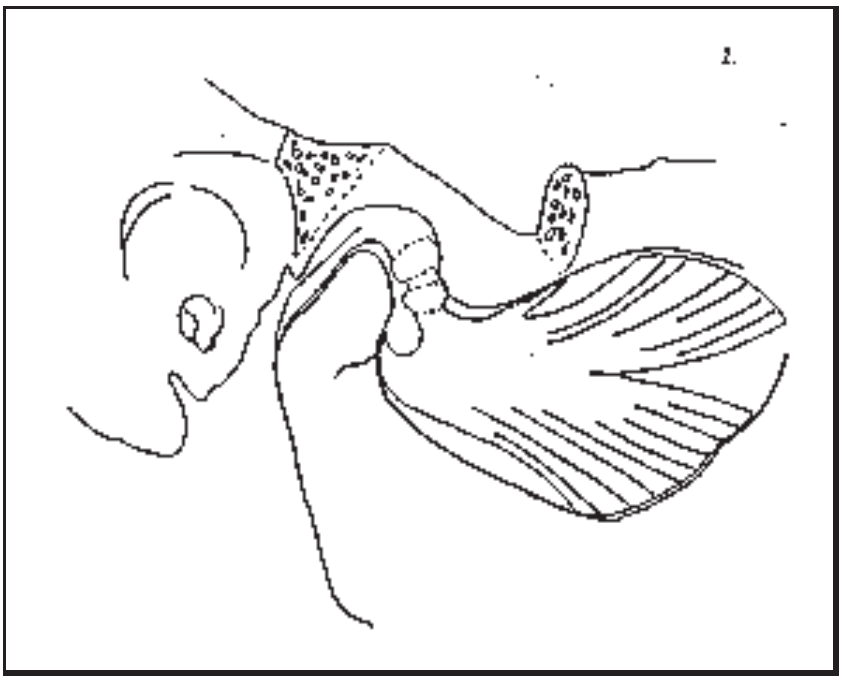
The bilaminar disc position has moved anterior and inferior allowing the condyle to occupy the space superior and posterior in the glenoid fossa.



With careful analysis and evaluation of the mechanics of the TM joint it can be easily ruled in or out as a causative factor.

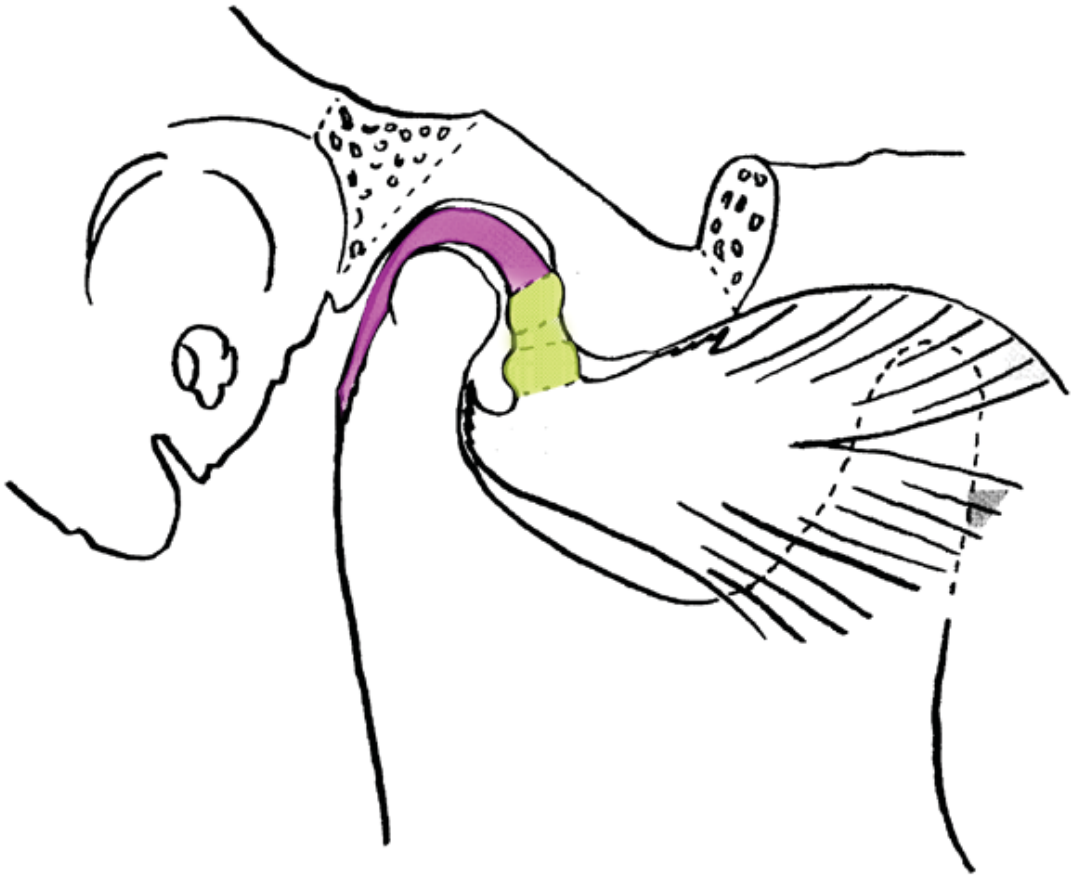
SUPERIOR POSTERIOR LATERAL TMJ

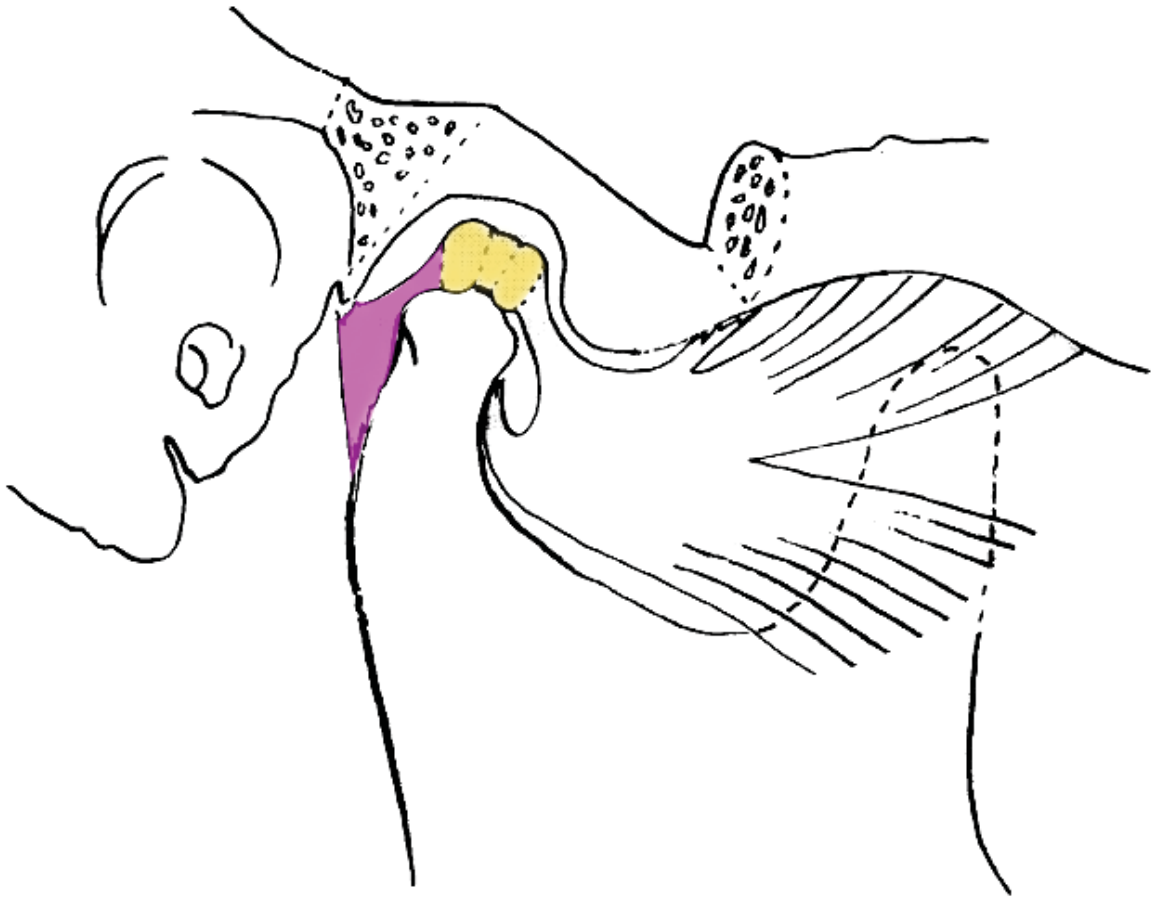
The bilaminar disc position has moved anterior and inferior allowing the condyle to occupy the space superior and posterior in the glenoid fossa.

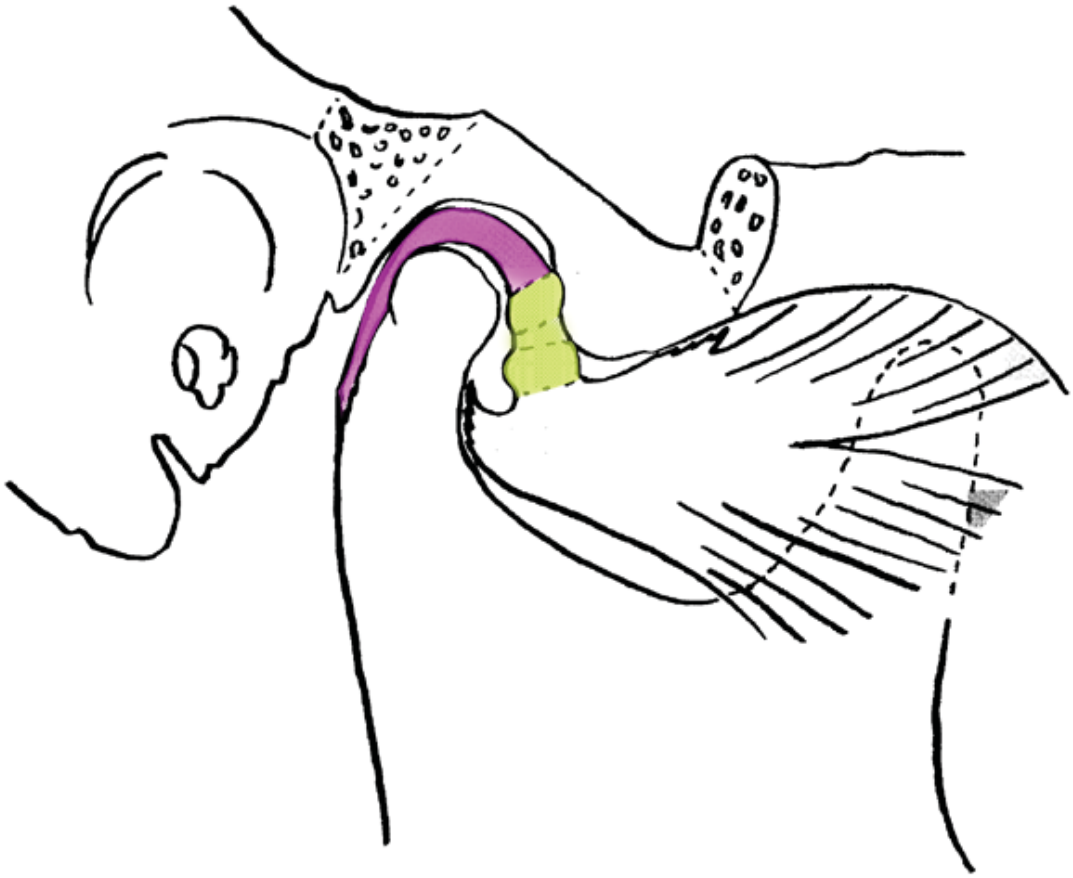


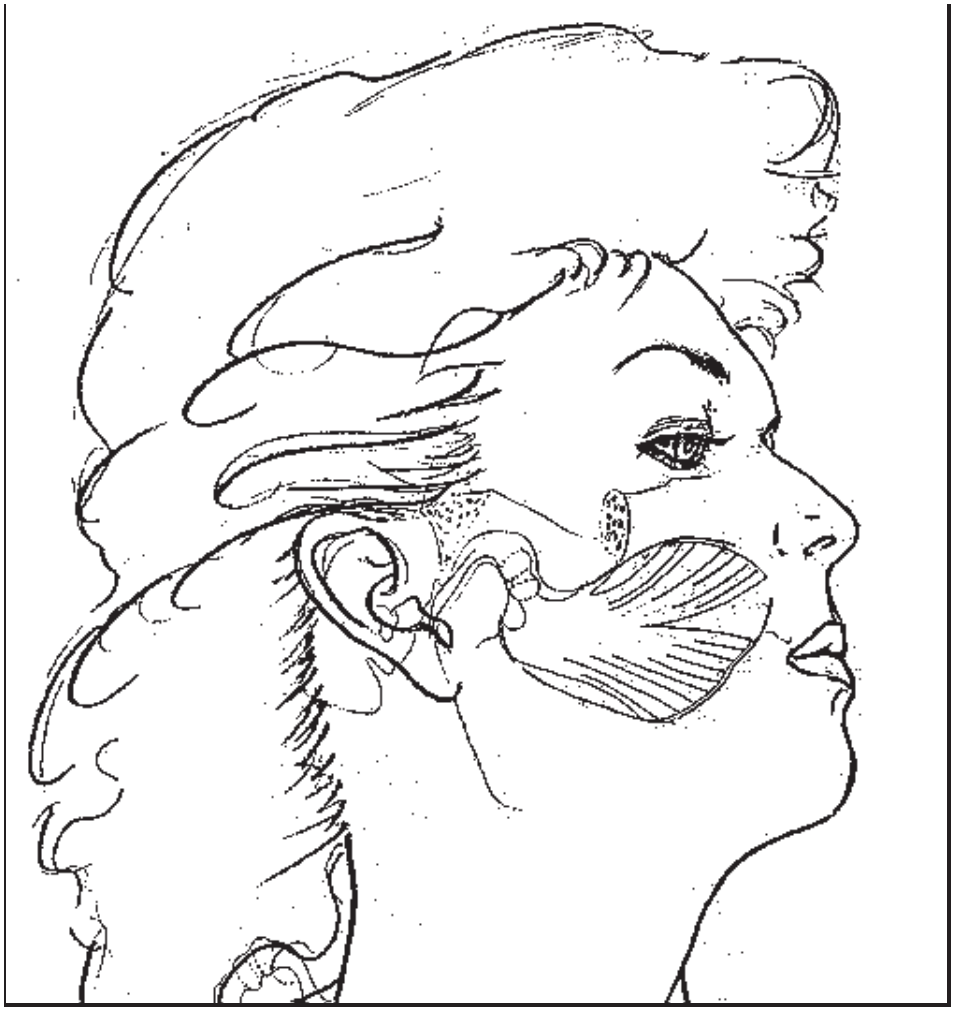
Imagine the trying to open your mouth and the right TM joint is bumping into the bilaminar disc.

How will the mentum of the mandible move if the Lt. TMJ is gliding normally?



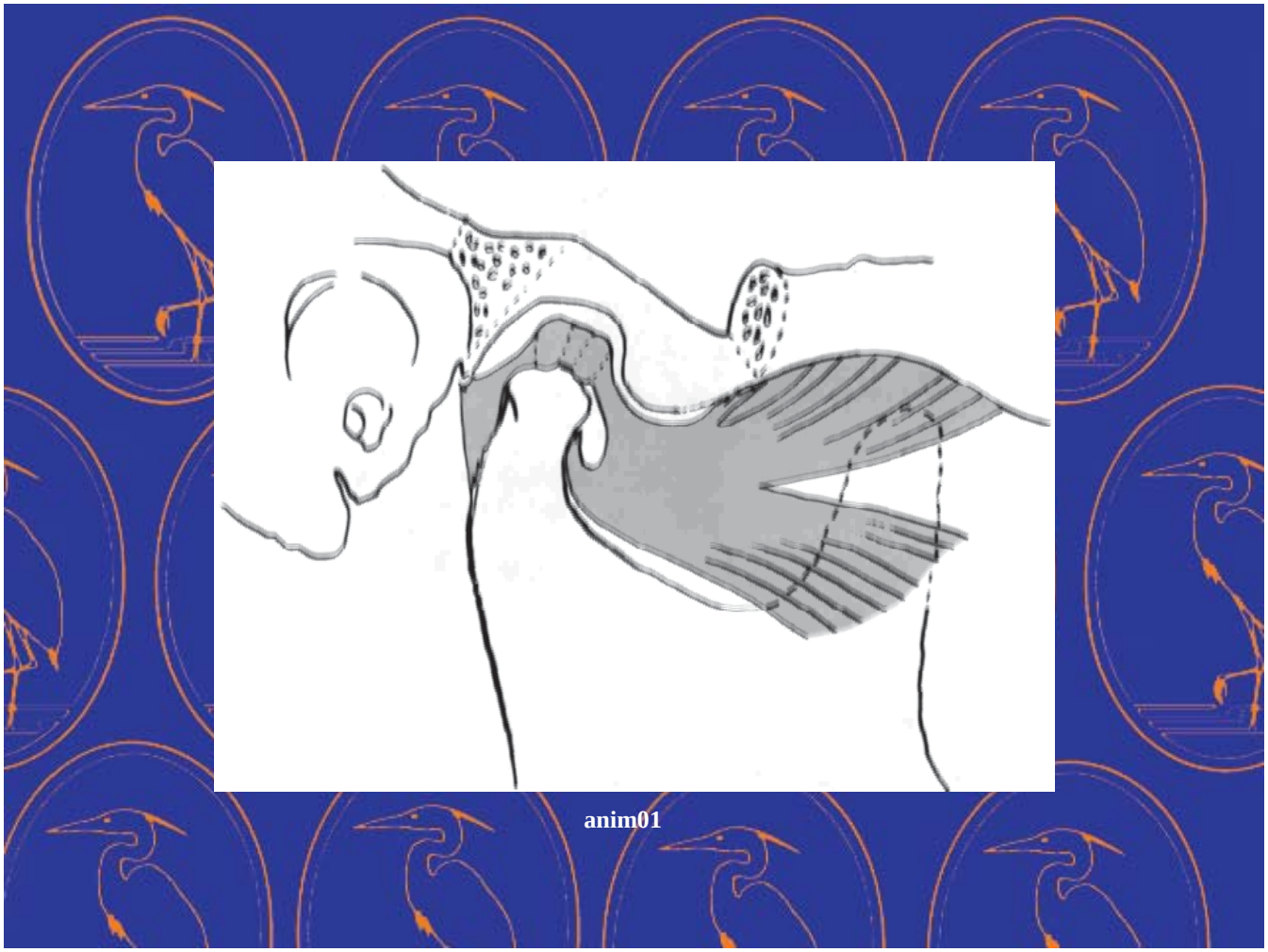






A blockade that will typically create a sudden shift and click of the disc as the condyle attempts to move forward against the malpositioned disc occurs.

ANTERIOR DISC DISPLACEMENT WITH REDUCTION
NOTICE THE POSTERIOR NECK ATTACHMENT



ANTERIOR DISC WITHOUT REDUCTION
NOTICE THE LACK OF POSTERIOR NECK ATTACHMENT

T.M.J. - Sup. Lat. = Condyle moves up and laterally in the glenoid fossa because the disc moves forward, down, and medially.

IND. - Prominence of condyle with tenderness on either side at glenoid fossa, with crepitus upon jaw movement. Upon opening the mouth, the jaw will deviate to the side of involvement, frequently seen after seeing their dentist or orthodontist or receiving a blow to the jaw. A bilateral involvement restricts jaw opening.

P.P. - Supine or sitting.

D.P. - Behind patient.

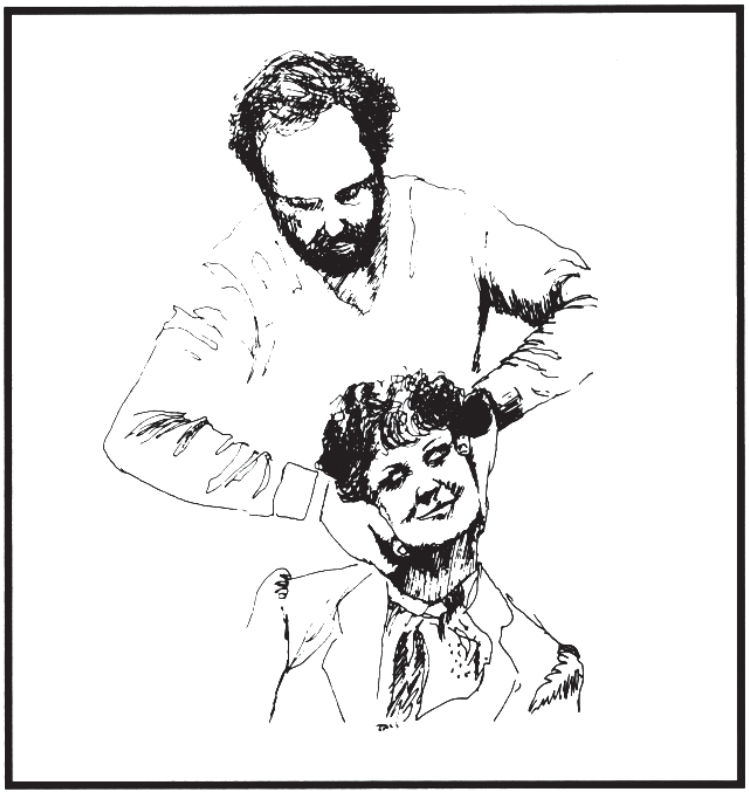
S.C.P. - Condyle of mandible.

S.H. - Supporting opposite condyle.

C.P. - Thenar eminence of hand on same side as lesion.

L.O.C. - S.I., R-L or L-R.

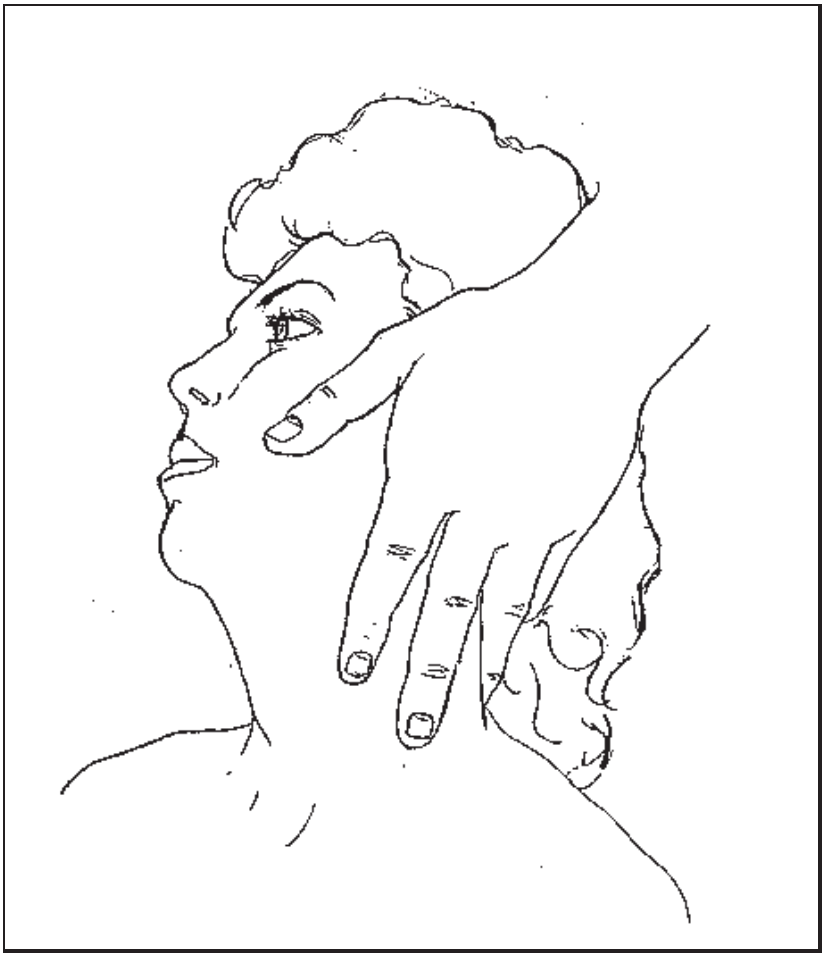
Jaw initially deviates toward side of involvement due to condyle bumping against anterior disc until jaw opens far enough to allow the condyle to drop inferiorly.



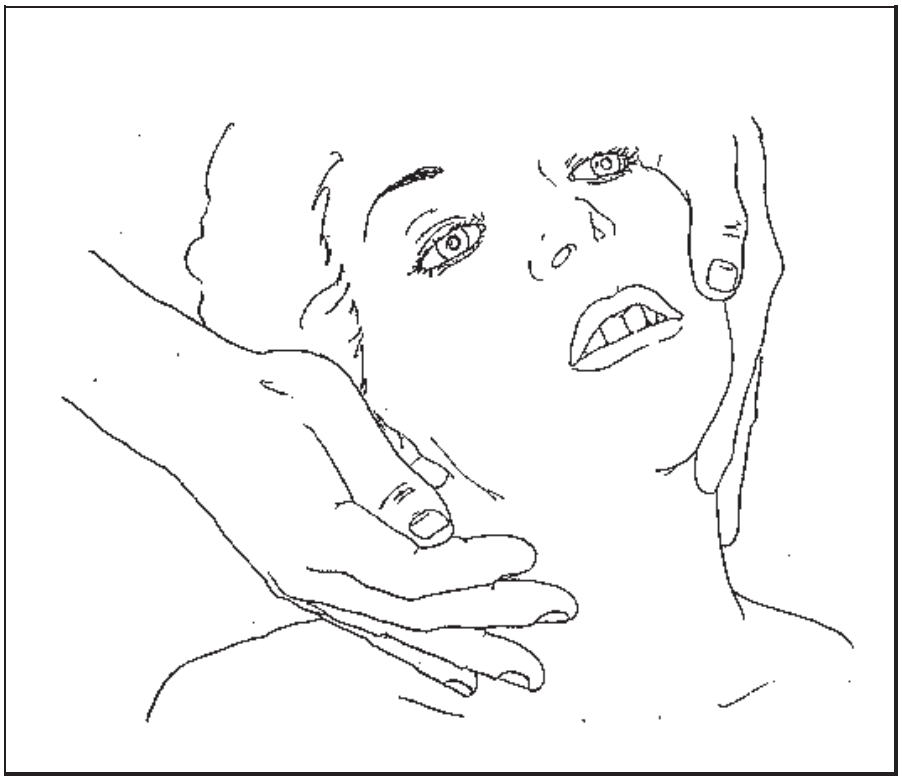
(Anterior disc displacement)

Click1

Stabilization hand on opposite side of involvement supporting jaw and cervical spine without compressing ear canal.

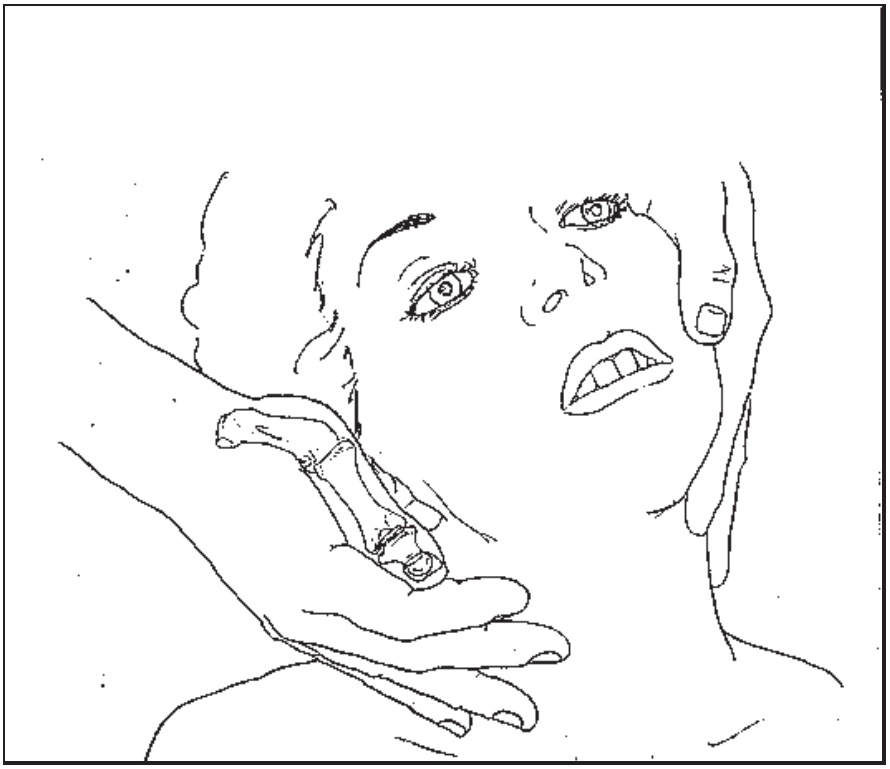


Contact hand with thenar pad flexed utilizing the proximal phalanx base of the thumb as the contact onto the condyle.



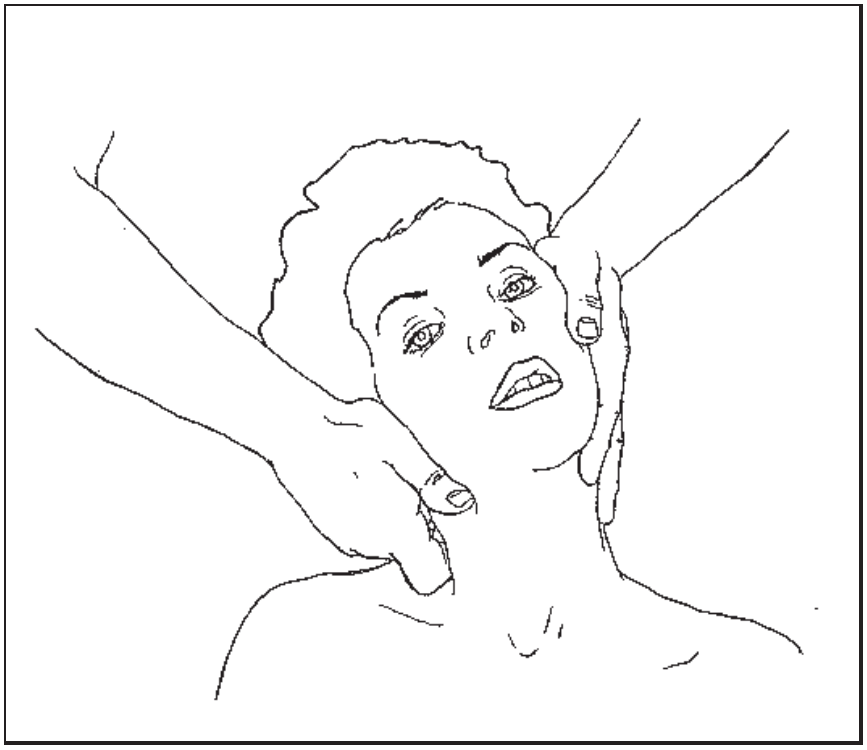
The proximal phalanx of the thumb for contact is clearly identified here

Can you touch that landmark on your thumb?



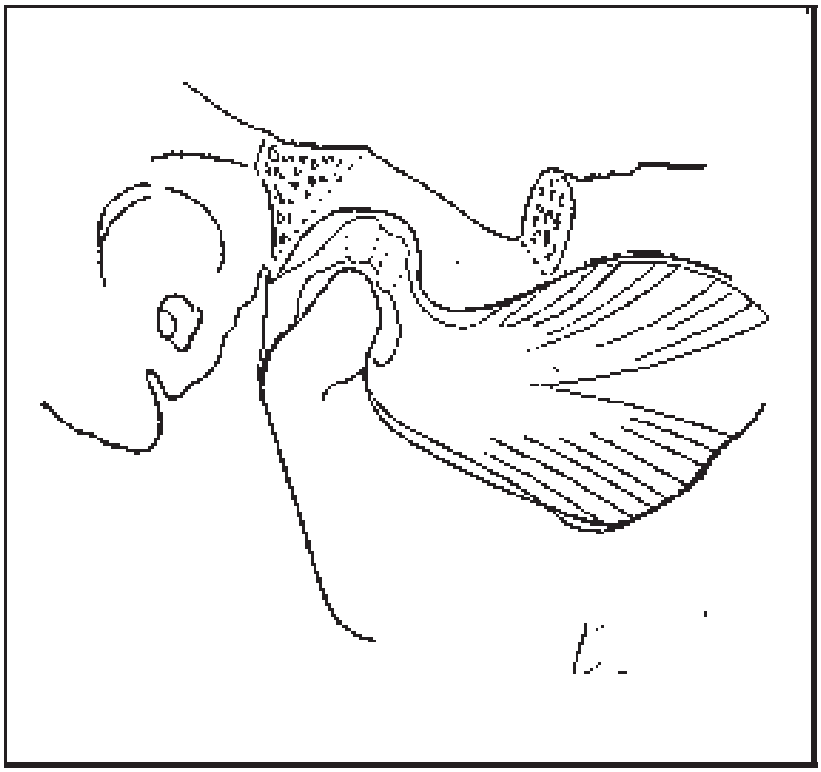
The right contact hand glides gently up to the zygomatic bone, then tissue pull is applied inferior onto the condyle with three to five pounds of pressure.

Tilt the head toward the side of involvement



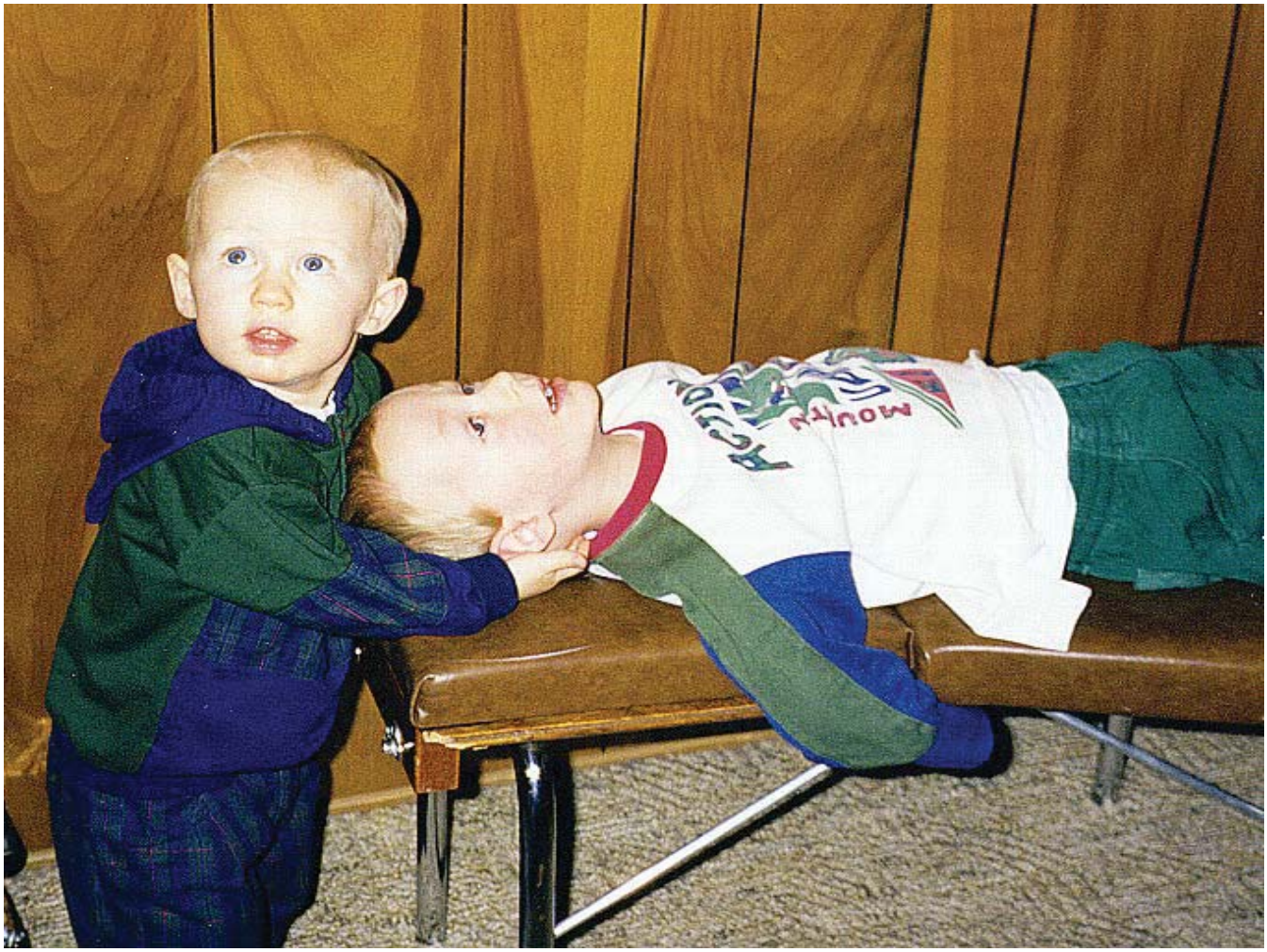
Gently turn the head away from the side of involvement to mild tension and notice if the forearm lines up directionally between the nipple and the shoulder on the opposite side. This is the correct line of drive down the side of the mandible.

Thrust inferior down the angle of the jaw to free the fixated anterior disc position about two to three inches in depth to the clavicle. It is important to have the fingers flexed to avoid jamming the finger tips into the clavicle and have enough space to thrust deep enough.



The ideal function of the disc is to glide forward with the condyle in the glenoid fossa acting as a protective slippery and flexible interface that reduces friction and creates smooth function.

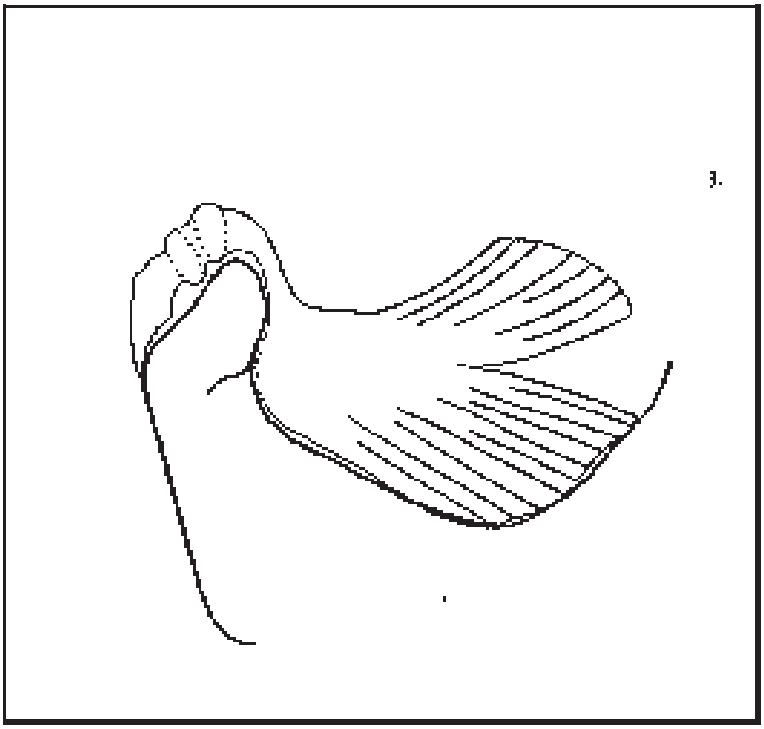
A mandible functioning like this should open straighter and smoother.



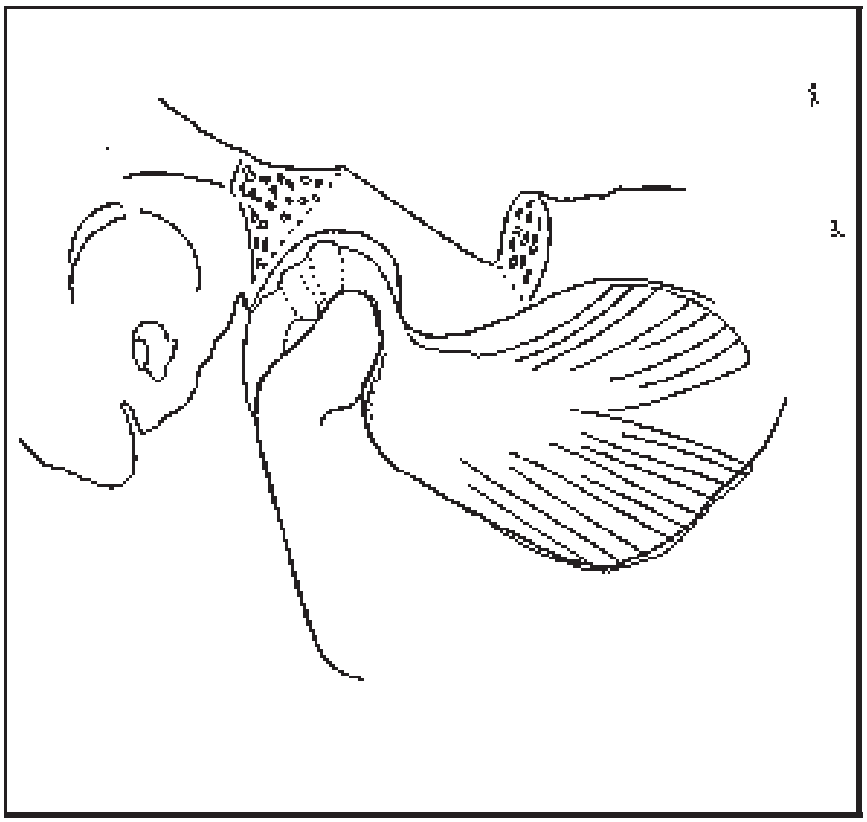
ANTERIOR INFERIOR condyle subluxation with posterior disc fixation.

The pathognomonic sign of this is an inability to close the teeth together on the side of involvement

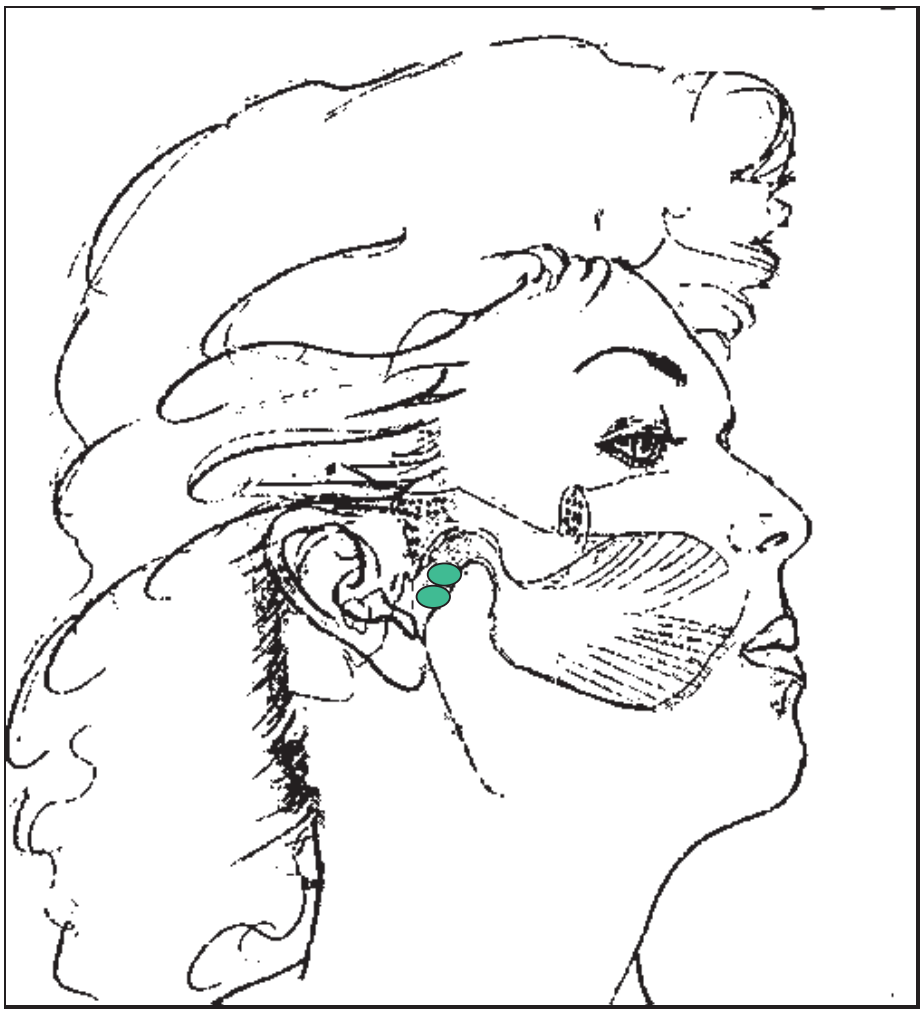
ANTERIOR INFERIOR TMJ
The disc is displaced in the posterior position moving the condyle anterior and inferior thereby limiting closing of the teeth together.

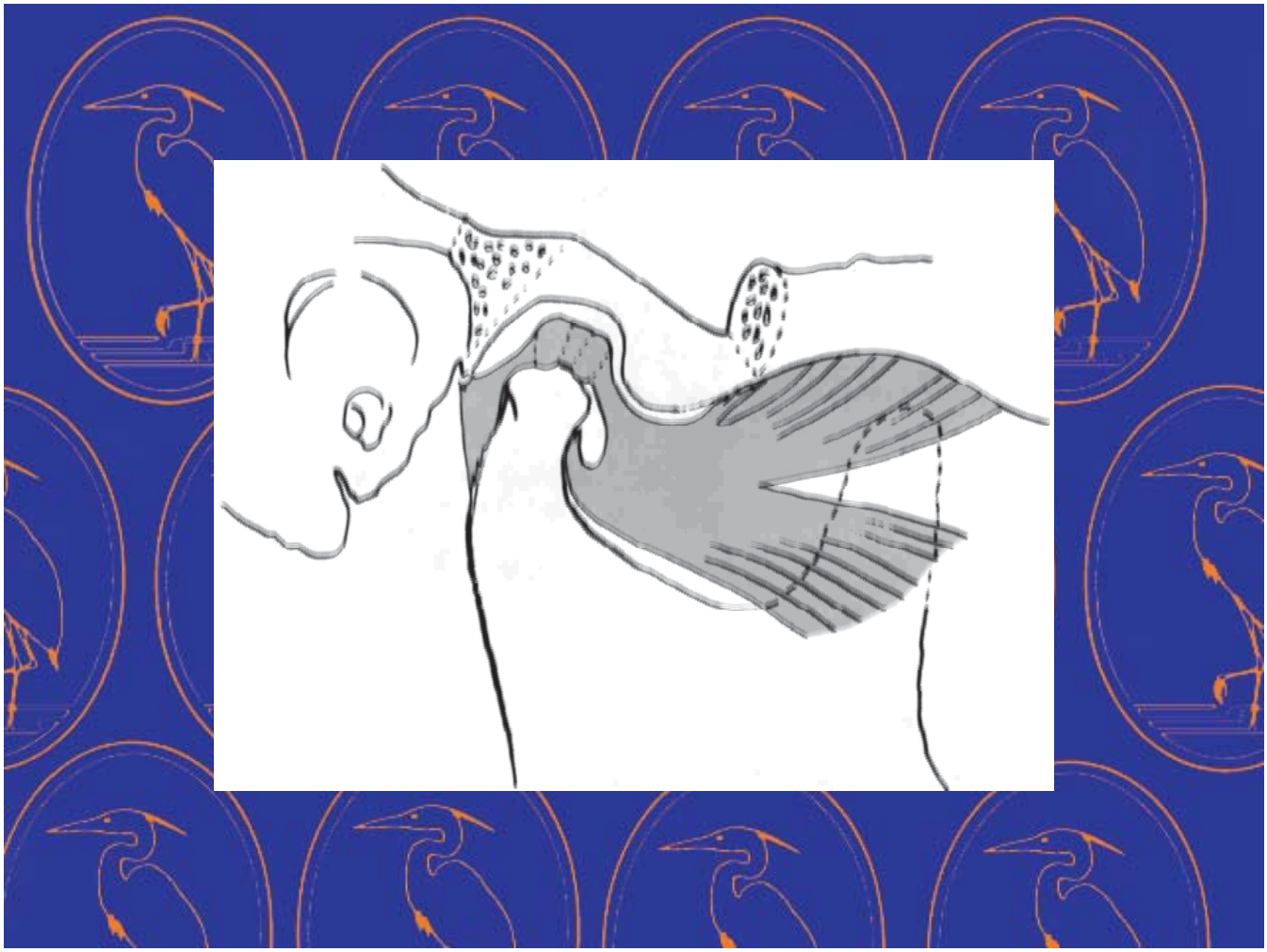


Open your mouth really wide and place your fingers deep into you glenoid fossa's and then try to close your mouth. This is what it feels like to have this condition. This person cannot chew food on the side of involvement and sometimes this can happen bilaterally. Food must be blended and sucked through a straw with these patients.



Moving the disc from the posterior position to on top of the condyle is what needs to happen.





T.M.J. - Ant. Inf. (Posterior Disc Discplacement)

IND. - Inability to close mouth entirely. The involved glenoid fossa is tender and more hollow.

P.P. - Sitting.

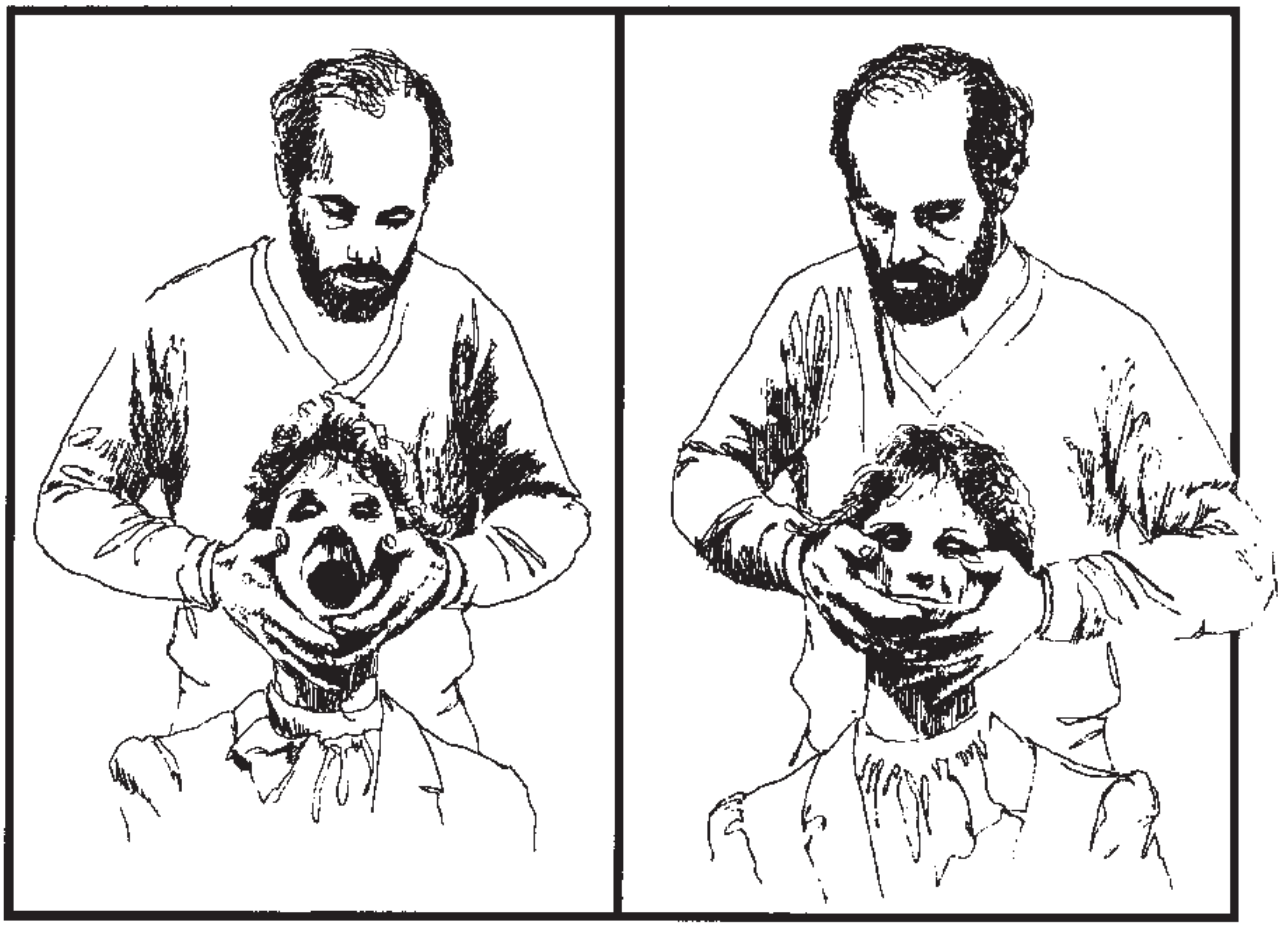
D.P. - Behind patient.

S.C.P. - Chin and ramus on involved side.

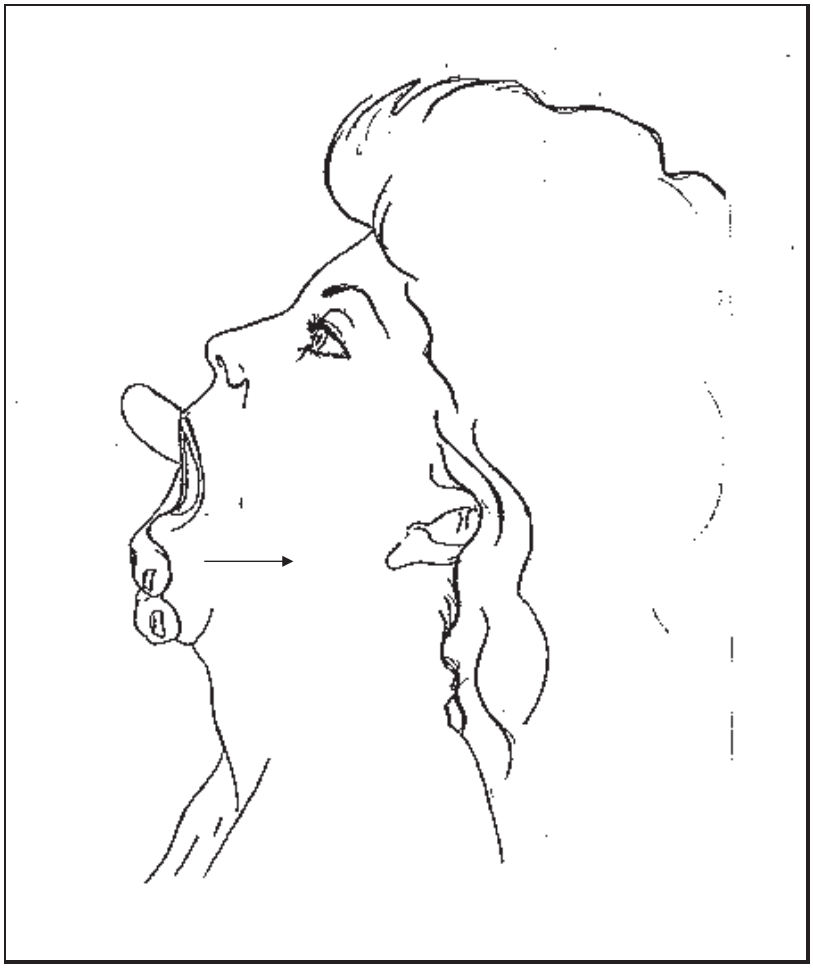
S.H. - Interlocking fingers with contact hand supporting opposite side.

C.P. - 1st and 2nd phalanx of index and middle fingers with thenar pad supporting ramus of mandible.

L.O.C. - A-P, I-S, Take contact gently and then have the patient open their mouth wide. Apply posterior firm pressure and have the patient close their mouth slowly. As the jaw releases, apply superior pressure also, until the mouth is closed.



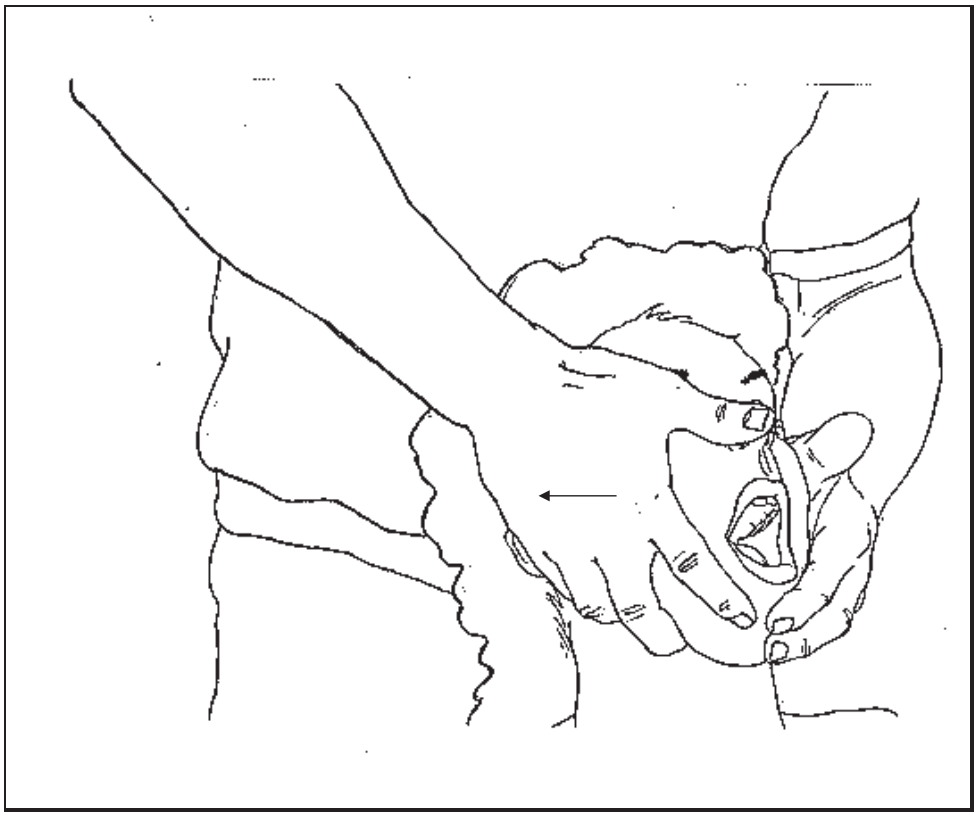
TMJ02A



Anterior inferior TMJ

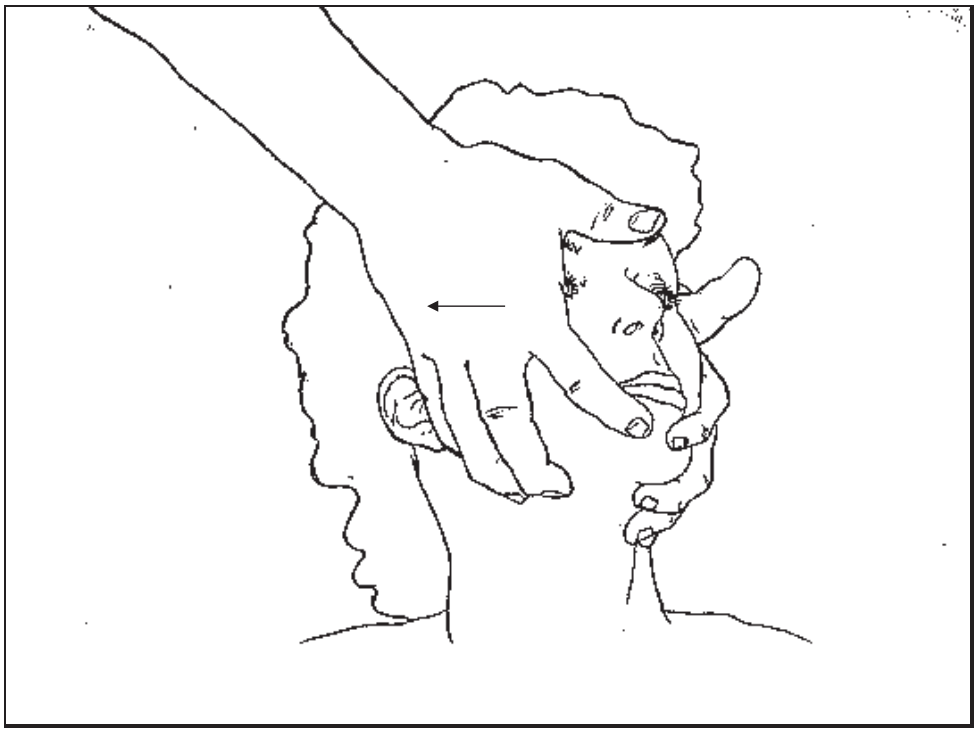
The disc is posterior.

Have the patient open their mouth wide, then place your fingers on the mentum of the jaw as shown.



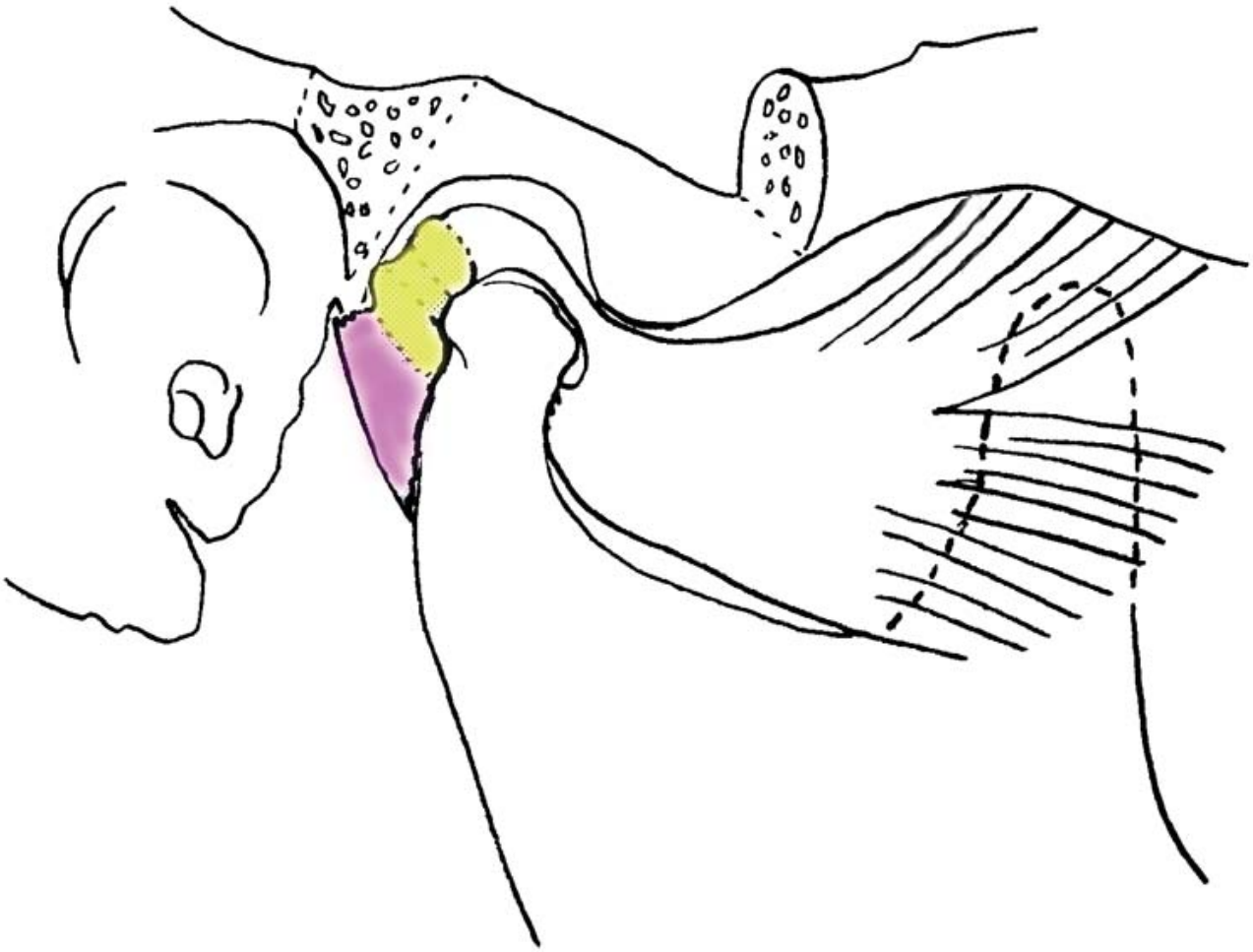
Anterior inferior TMJ

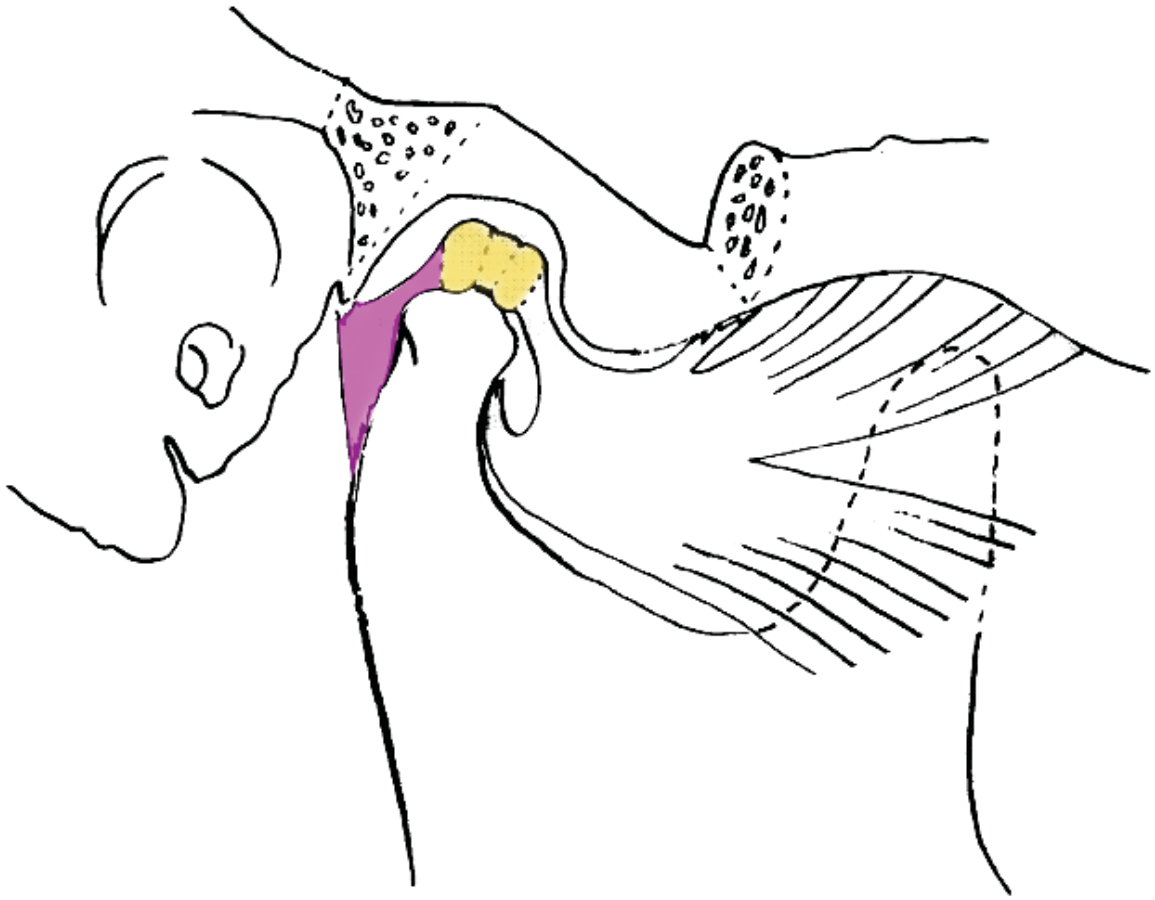
Pull gently posterior on mentum and instruct the patient to let the jaw relax to the closed position.

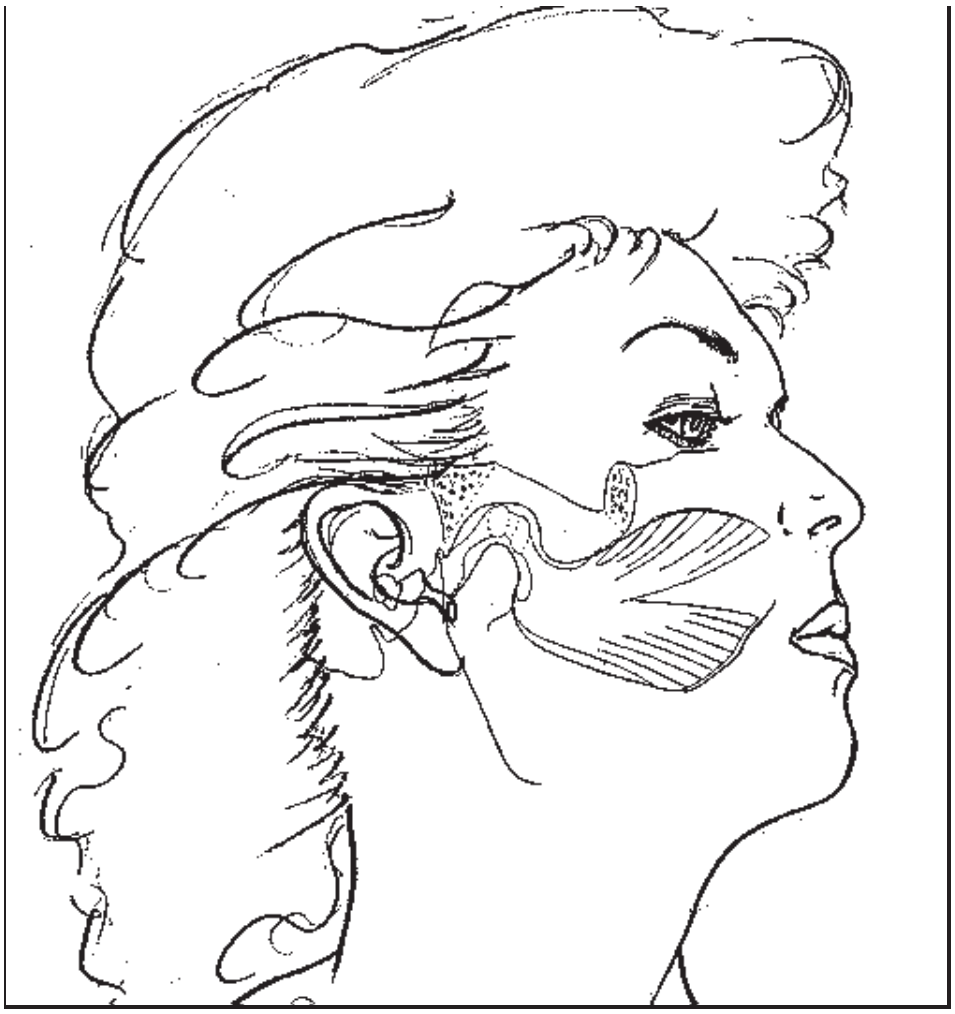


Anterior inferior TMJ

As the jaw closes it frequently has a resistance like it is going over a ridge and then upon clearing it, closes easy.







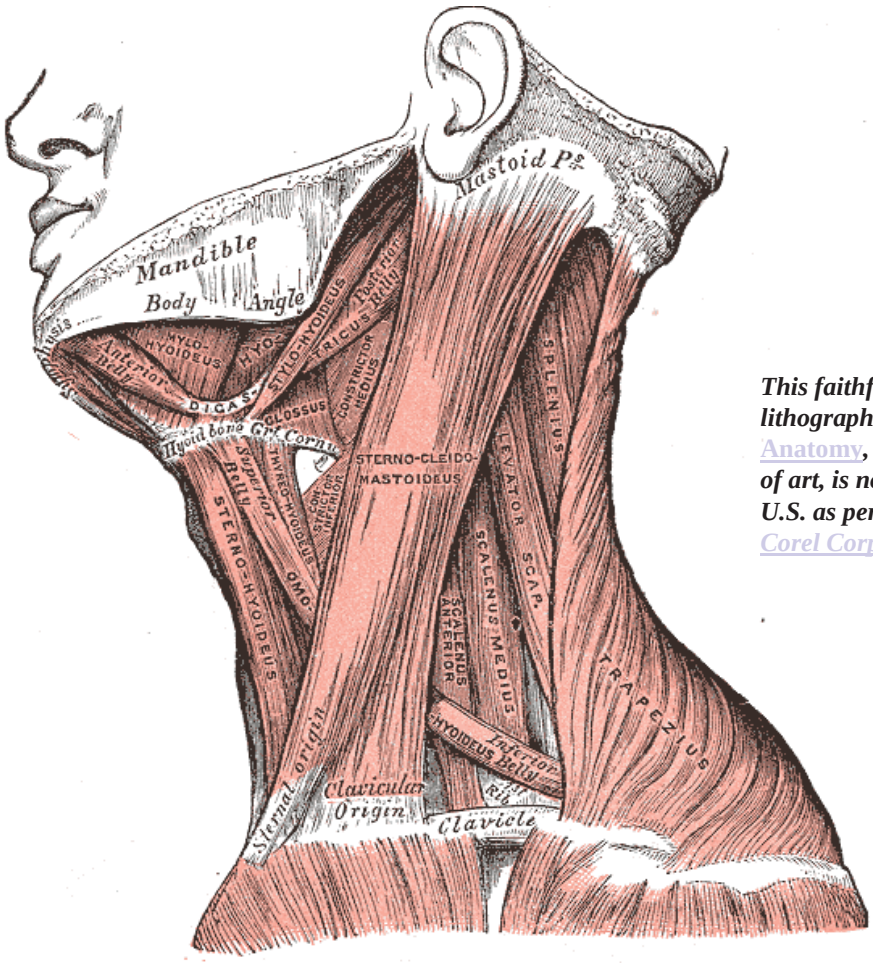
The TMJ restored to normal position and function

RECTUS CAPITUS POSTERIOR MINOR
THE DURAL CONNECTION

Connective tissue bridges were noted at the atlanto-occipital junction between the rectus capitis posterior minor muscle and the dorsal spinal dura

The dura-muscular, dura-ligamentous connections in the upper cervical spine and occipital areas may provide anatomic and physiologic answers to the cause of the cervicogenic headache. This proposal would further explain manipulation's efficacy in the treatment of cervicogenic headache [1].

^ **Gary D. Hack, Peter Ratiu, John P. Kerr, Gwendolyn F. Dunn, Mi Young Toh. "Visualization of the Muscle-Dural Bridge in the Visible Human Female Data Set". *The Visible Human Project, National Library of Medicine*. http://www.nlm.nih.gov/research/visible/vhp_conf/hack2/hack2.htm.**



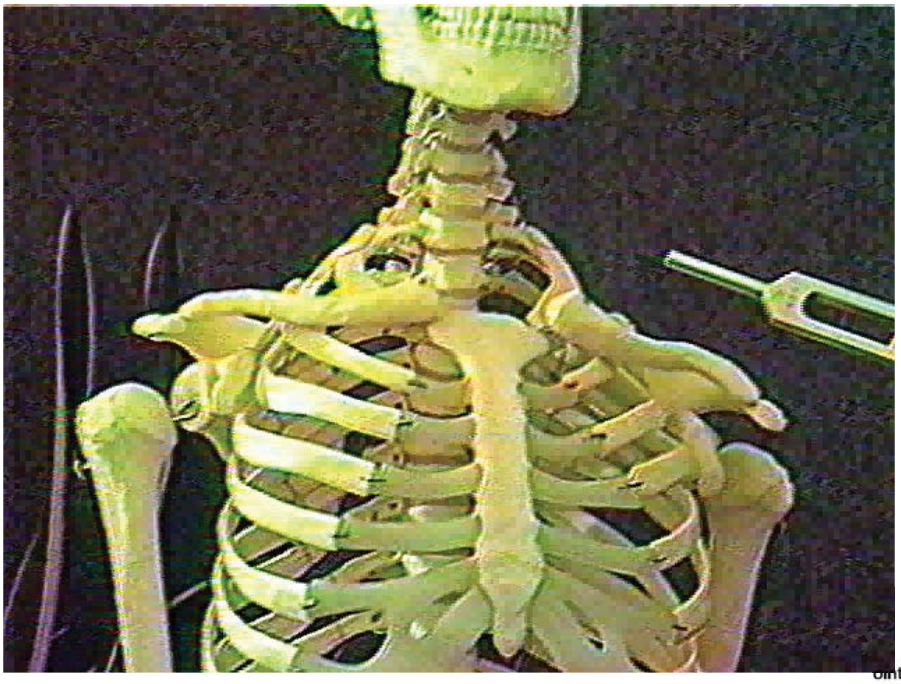
This faithful reproduction of a lithograph plate from Gray's Anatomy, a two-dimensional work of art, is not copyrightable in the U.S. as per Bridgeman Art Library v. Corel Corp.;

Foods to avoid are tough to chew e.g.. beef jerky or taffy.
Icing the area with a Dixie cup ice massage for five minutes, three times a day is an excellent idea.
Protocol for patients with dentures is as follows: if patient does not respond within three visits.

1. **Schedule an appointment with their denturist immediately following your office visit.**
2. **Take dentures out and adjust their T.M.J..**
3. **Send them to the denturist for fitting and alignment without dentures in!**
4. **With new dentures the patients T.M.J. has a better chance of responding.**

Exercises for the first two weeks should be in the directions of weakness.

THE NERVE OF RIBS



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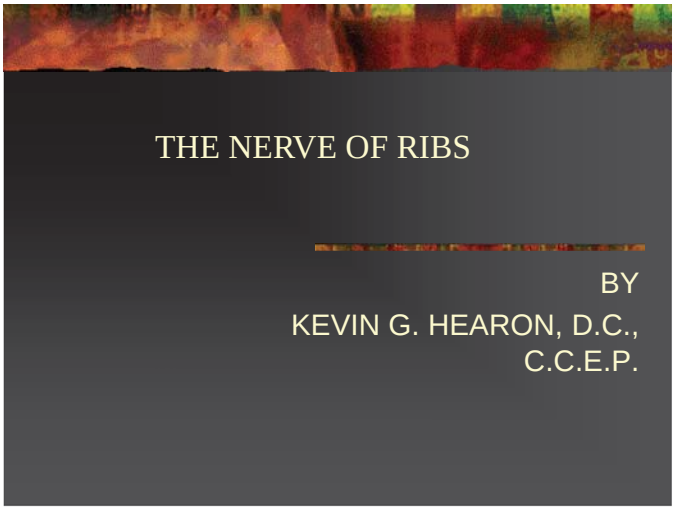
RIB01

THE NERVE OF RIBS

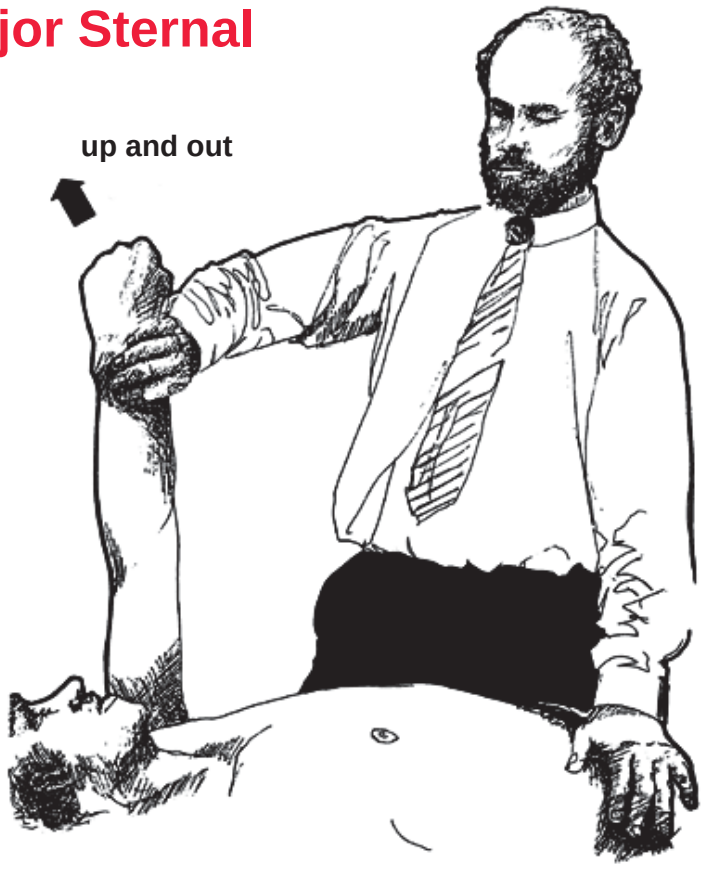


RIB01

COSTO STERNAL - Ant.

Muscle	=	Pect. Maj. Sternal [upper 6 ribs]
IND.	-	Prominent rib, tenderness at prominence, difficult breathing, chronic recurrent subluxation of vertebrae on same rib.
P.P.	-	Supine, 30 degrees to involved side.
D.P.	-	Opposite side of involved rib facing patient.
S.C.P.	-	Prominent rib.
C.P.	-	Support patient's back with caudad thigh. Pisiform of caudad hand.
L.O.C.	-	M-L, A-P. Contact point designed to slip off during thrust once segment is set.

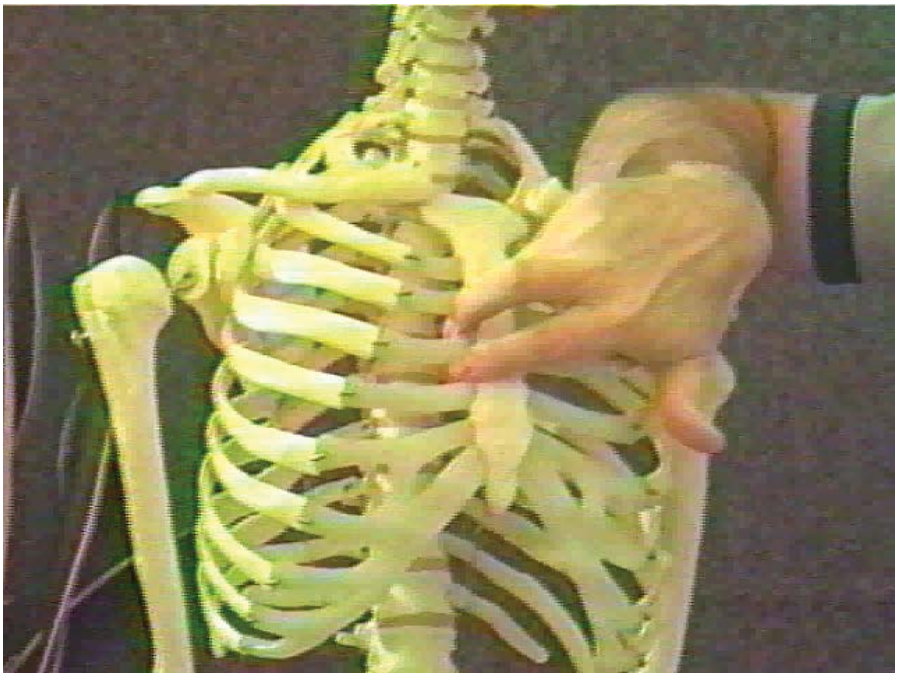
Pectoralis Major Sternal



RIB02A

COSTO STERNAL AND COSTO CHONDRAL - Ant. Post. Sup. Inf.

Muscle	=	Pect. Maj. Sternal [upper 6 ribs]
IND.	-	Chest pains, difficult breathing, tender and prominent at costo chondral space.
P.P.	-	Supine.
D.P.	-	Opposite side facing patient.
S.C.P.	-	Cartilage of rib and anterior rib.
C.P.	-	Inferior hand with index finger taking tissue pull from medial to lateral.
S.H.	-	Index and middle fingers of superior hand; One on each side of cartilage taking tissue pull medially.
L.O.C.	-	Pulling apart costo chondral articulation to allow the rib sheath to align the segments, then release.



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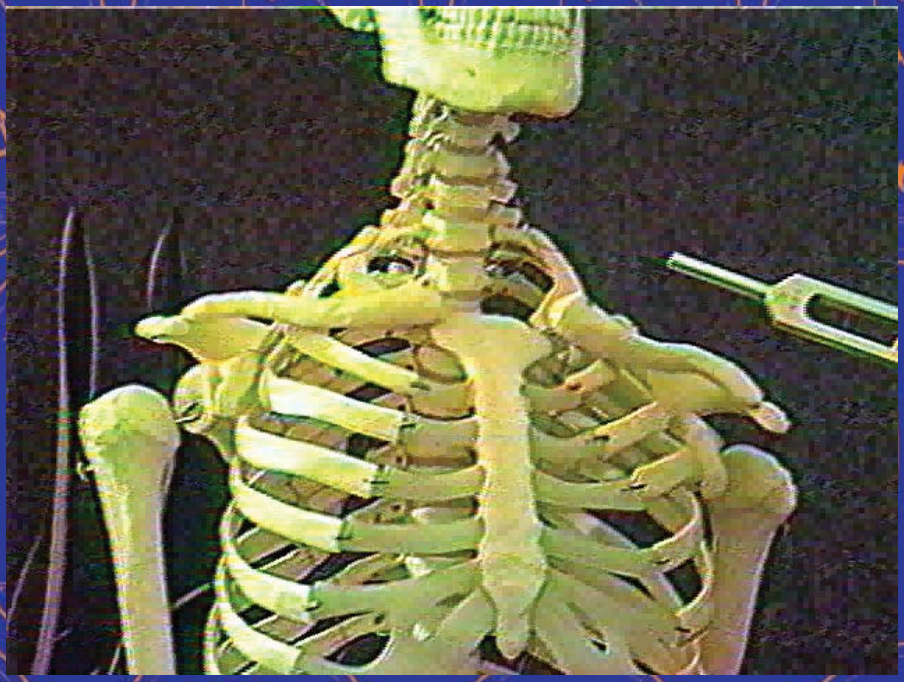
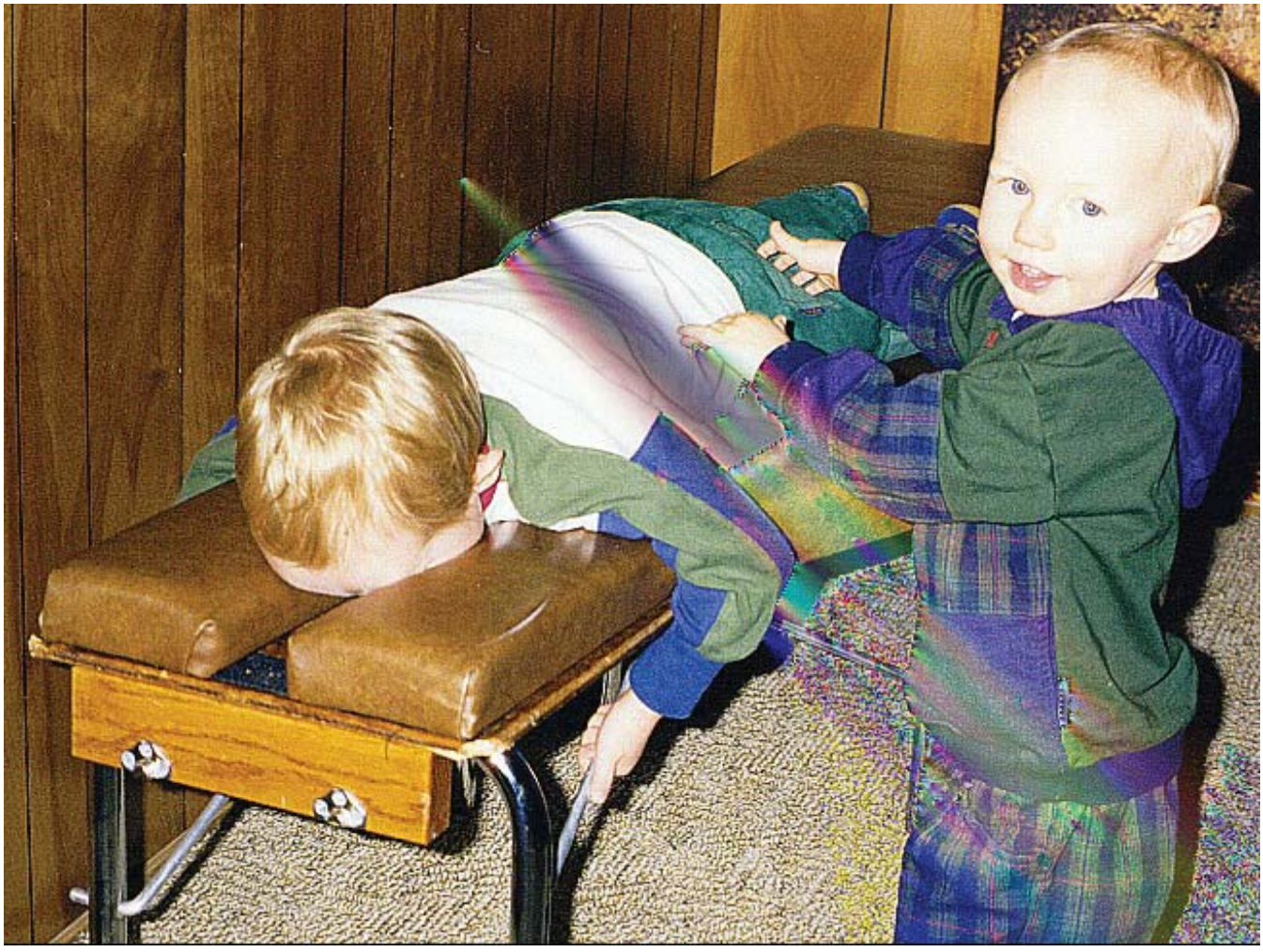


RIB01

RIB05B



COSTAL ANGLE - Sup. or Inf.

Muscle = Ant. Serratus

IND. - Intercostal neuralgia, narrowed intercostal space, difficult breathing.

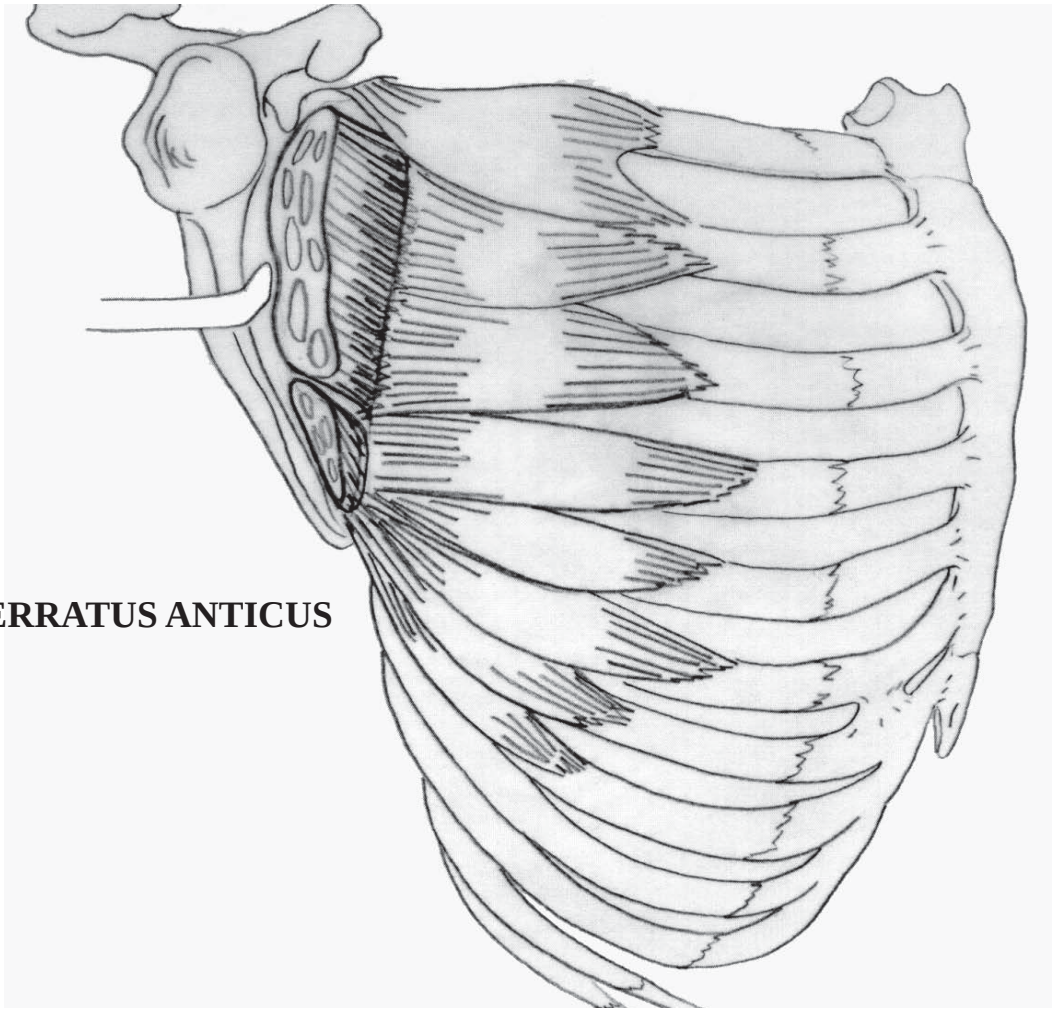
P.P. - Prone.

S.C.P. - Rib angle.

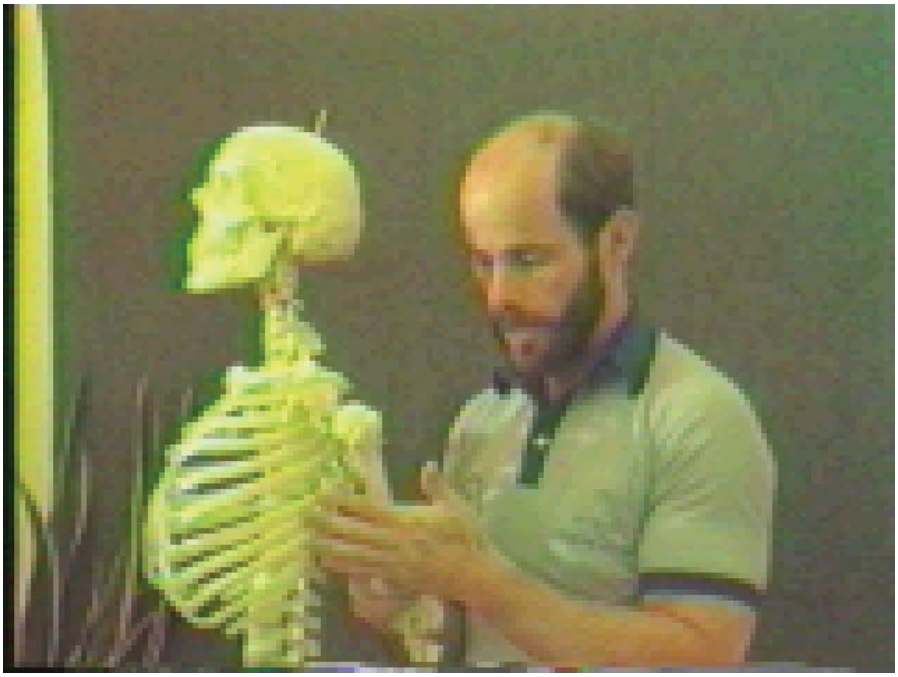
S.H. - Knife edge along posterior rib in intercostal space of rib above for Sup. and below for Inf.

C.P. - Knife edge of hand or thumb.

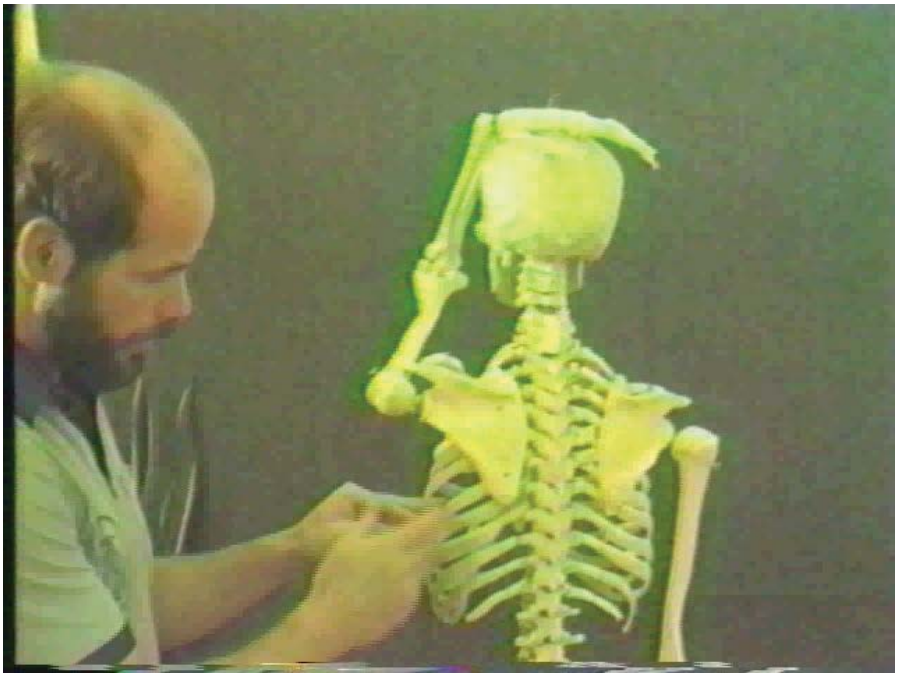
L.O.C. - Sup. for inferior rib, Inf. for superior rib. Scissors action of both hands with arms nearly parallel to surface of Pt.'s body.



SERRATUS ANTICUS

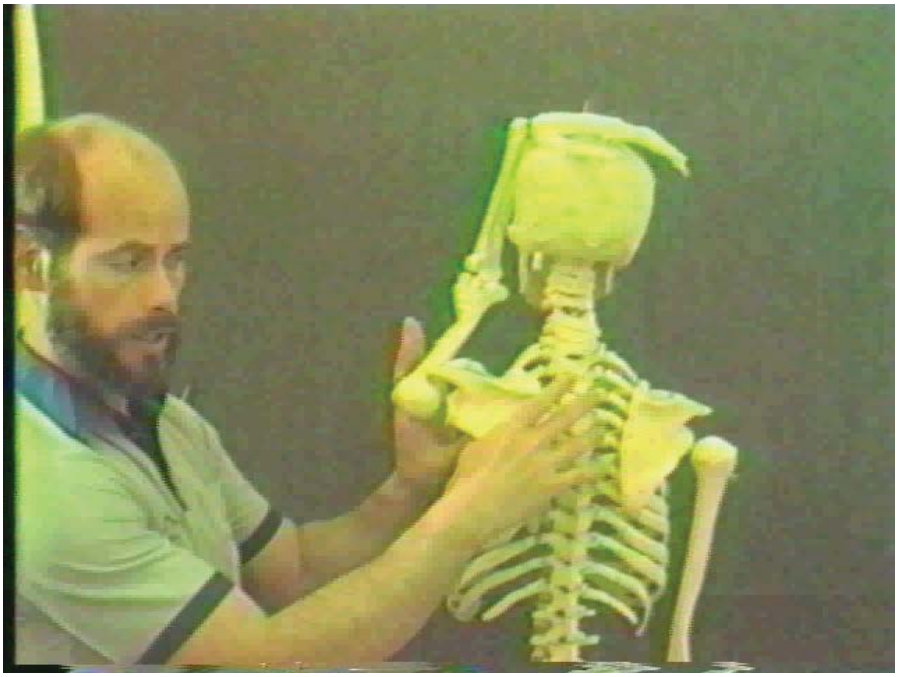


RIB06A



RIB07B

RIB08B



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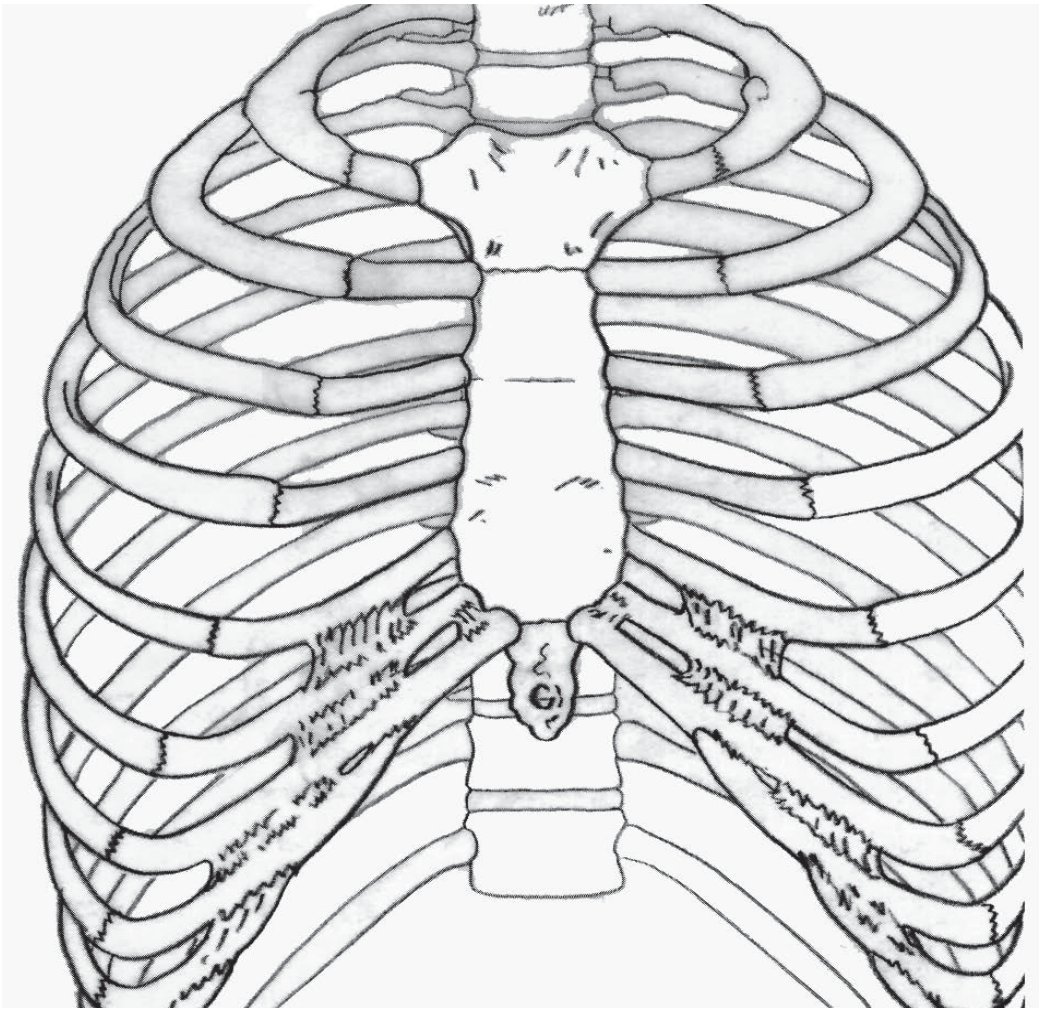
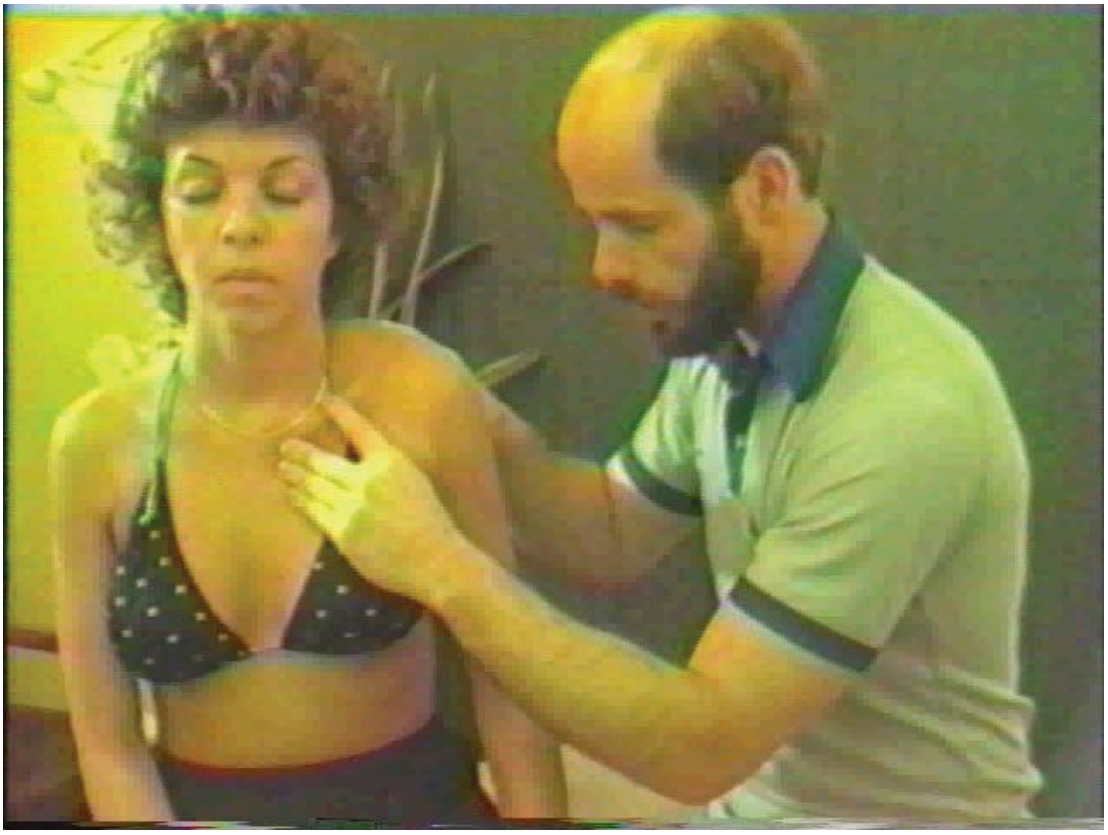




RIB10B

COSTO TRANSVERSE AND COSTO VERTEBRAL - Sup. and Post.

Muscle = Rhomboid

IND. - Tender with prominence on either side of spinous rotation of vertebrae. Anterior dorsals. Intercostal neuralgia.

P.P. - Prone.

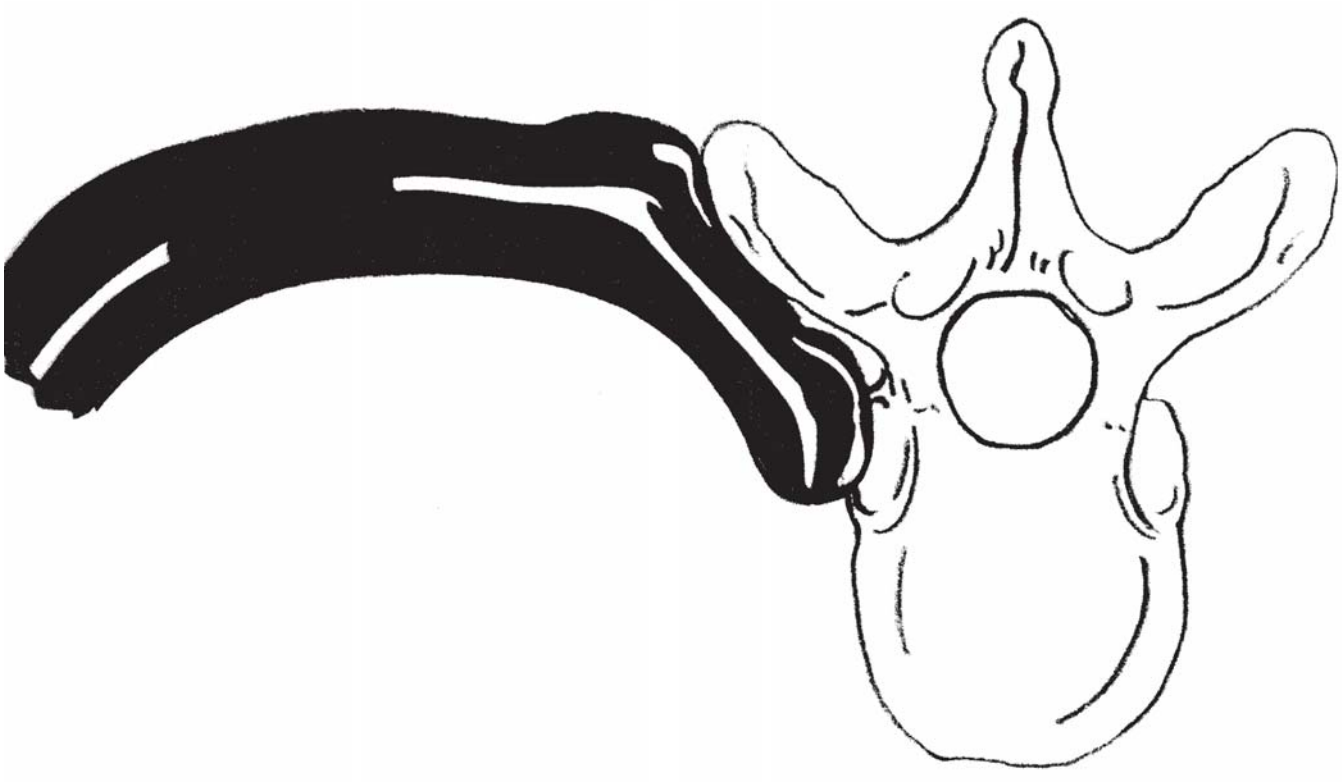
D.P. - Same side facing patient.

S.C.P. - Posterior superior surface of rib head.

S.H. - Opposite transverse with caudad thenar pad.

C.P. - Pisiform of cephalad hand.

L.O.C. - P-A, S-I, depth of thrust is slightly less than that used for spinal adjustment. When this has been accomplished, move to the other side of the patient to correct the rotation and posterity or anteriority of the vertebrae involved.



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Nerves and nerve plexuses of the human vertebral column

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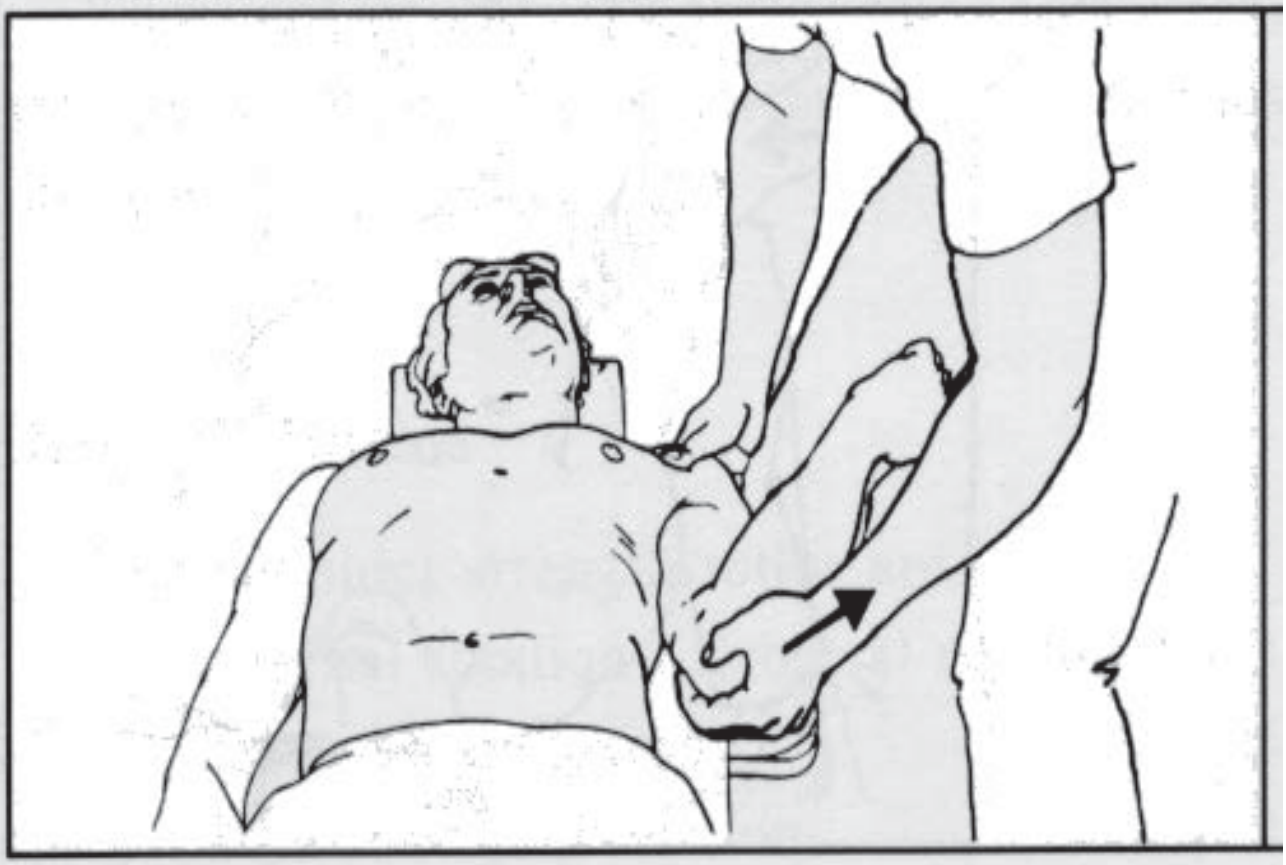
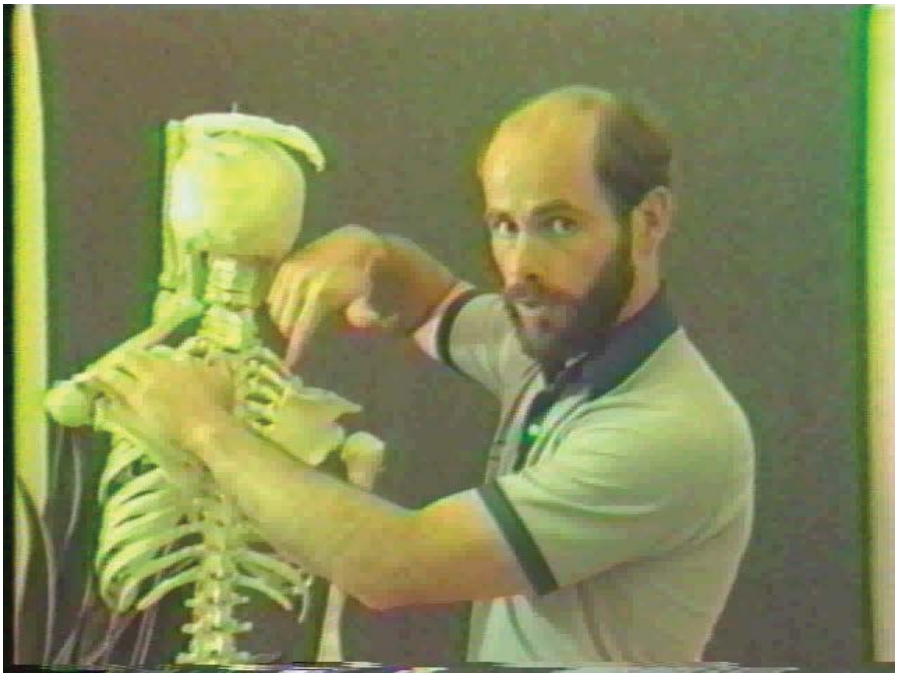
Abstract

The origin, distribution, and termination pattern of nerves supplying the vertebral column and its associated structures have been studied in the human fetus by means of an acetylcholinesterase whole-mount method. The vertebral column is surrounded by ventral and dorsal nerve plexuses which are interconnected. The ventral nerve plexus consists of the nerve plexus associated with the anterior longitudinal ligament. This longitudinally oriented nerve plexus has a bilateral supply from many small branches of the sympathetic trunk, rami communicantes, and perivascular nerve plexuses of segmental arteries. In the thoracic region, the ventral nerve plexus also is connected to the nerve plexuses of costovertebral joints. The dorsal nerve plexus is made up of the nerve plexus associated with the posterior longitudinal ligament. This nerve plexus is more irregular and receives contributions only from the sinu-vertebral nerves. The sinu-vertebral nerves originate from the rami communicantes and, in the cervical region, also from the nerve plexus of the vertebral artery. Thick and thin sinu-vertebral nerves are found. Most frequently three types of thick sinu-vertebral nerves are observed, i.e., ascending, descending, or dichotomizing ones. Finally, the distribution of the branches of the ventral and dorsal nerve plexuses and of the sinu-vertebral nerves is described.

Rhomboids, C4, 5, Rib Head





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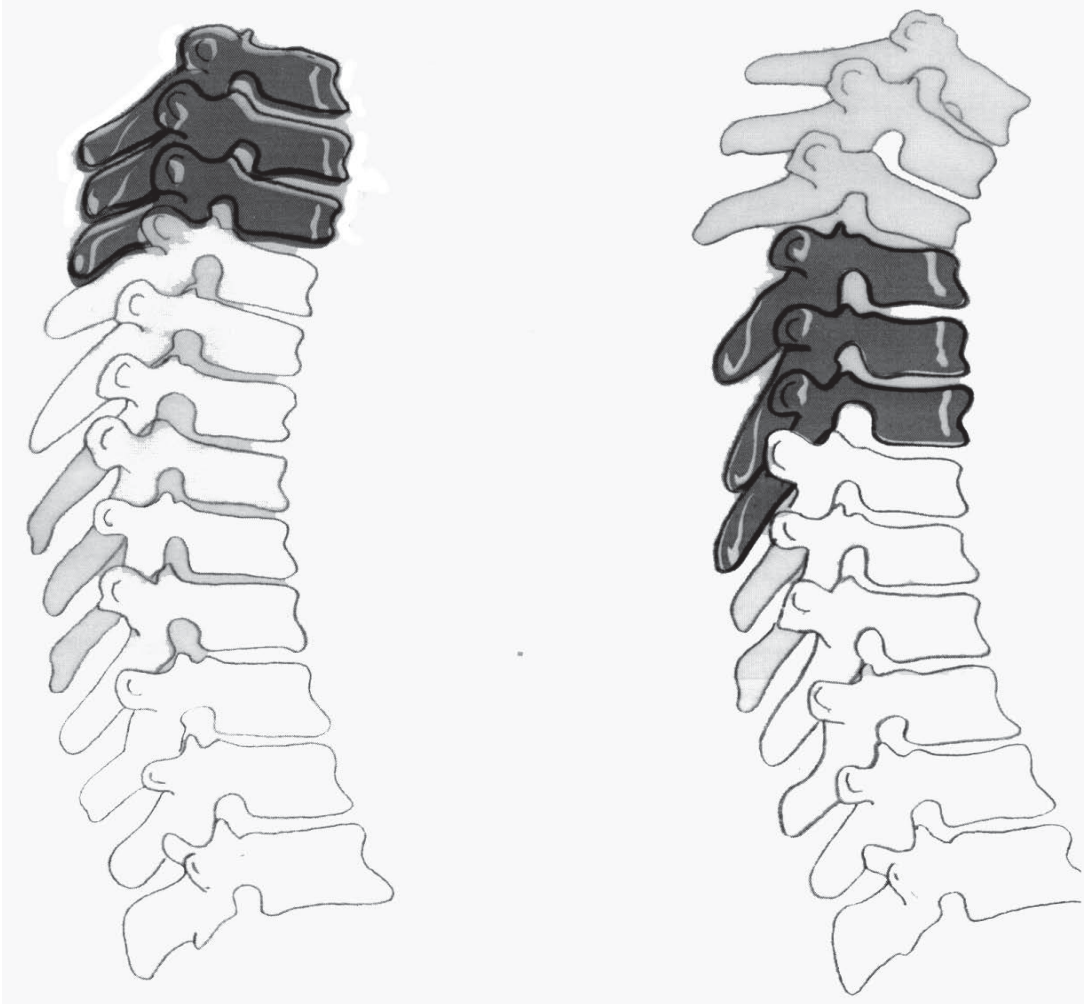
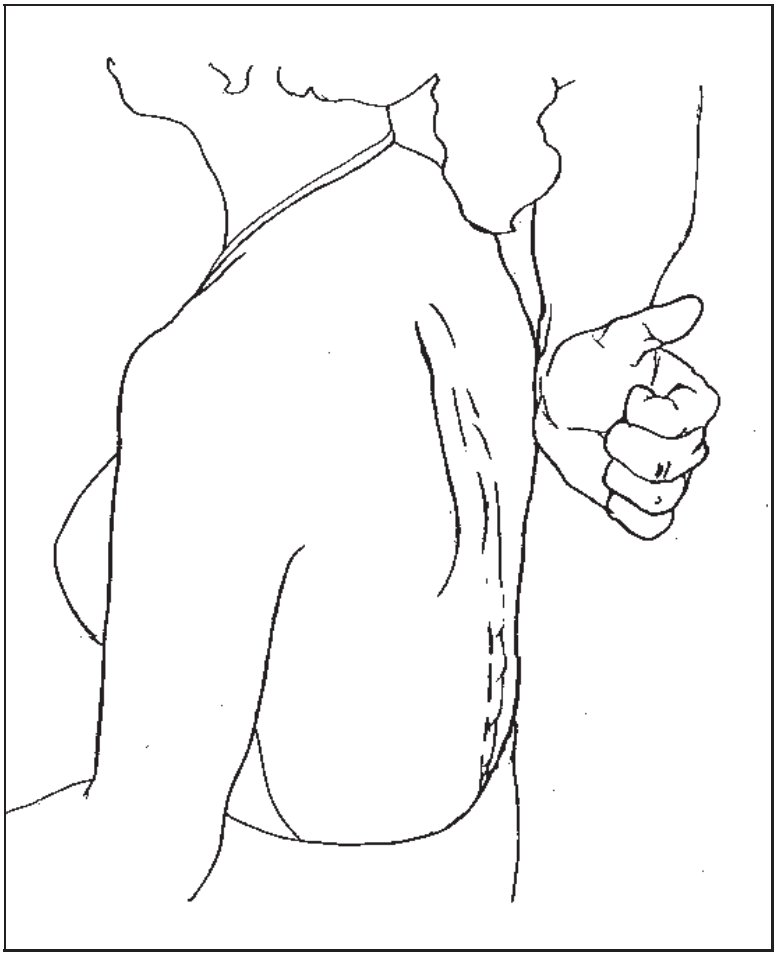
RIB13B



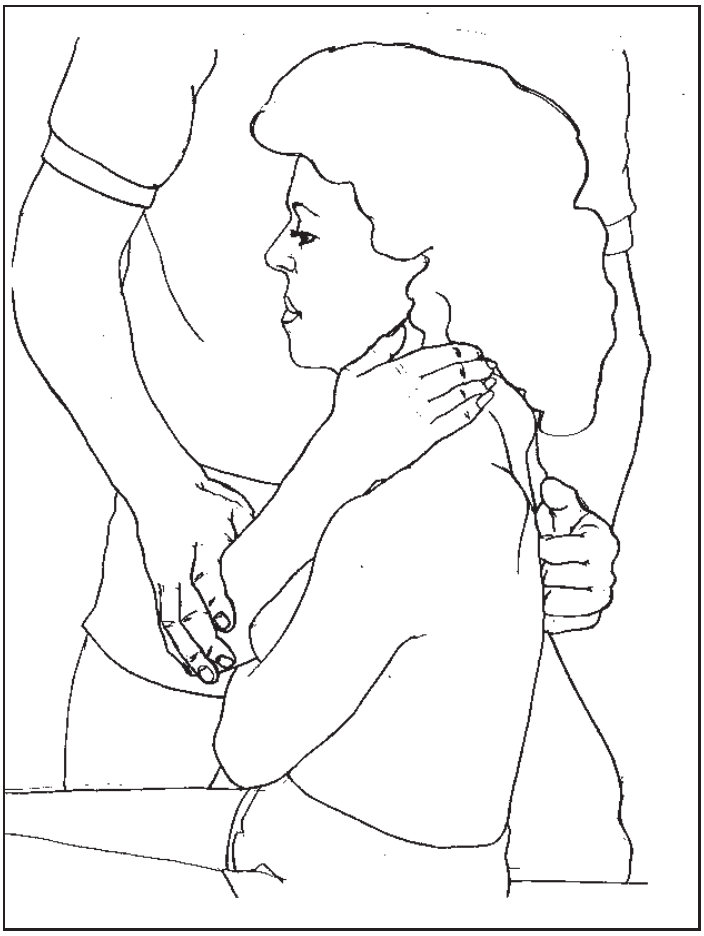


ANTERIOR DORSALS T6-4

The stabilization hand curls the distal fingers to form a sulcus, into which the spinuses move, and vertical stabilizers for each side of the paraspinal muscles, in the form of the heel of the hand and a row of mid phalanges.

The hand is placed at the bottom of the involved block of anterior dorsals so that the lowest vertebra spinus (T6) is at the level of the ring and middle finger.

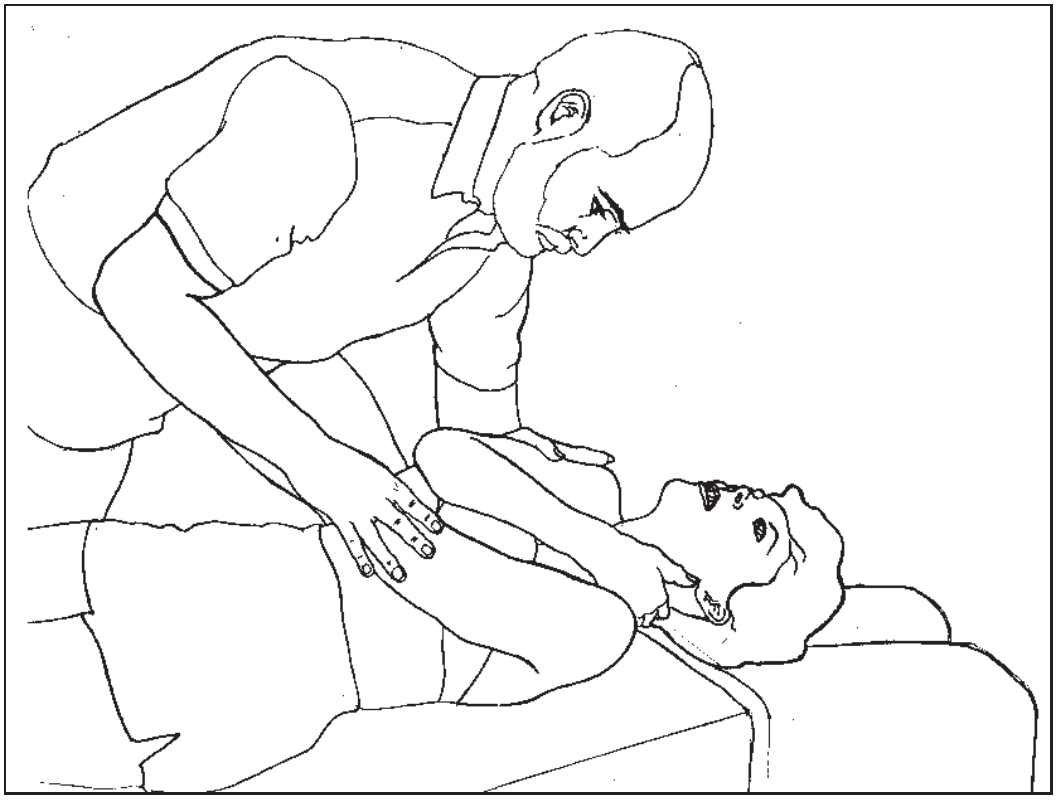
This placement can be adapted up or down the thoracic spine to the level of involvement and allows for tissue glide superior upon lying the patient down.



ANTERIOR DORSALS T6-4

The proximal arms hand is placed on the opposite side of the neck.

The distal arms hand is brought underneath the elbow to the opposite shoulder.

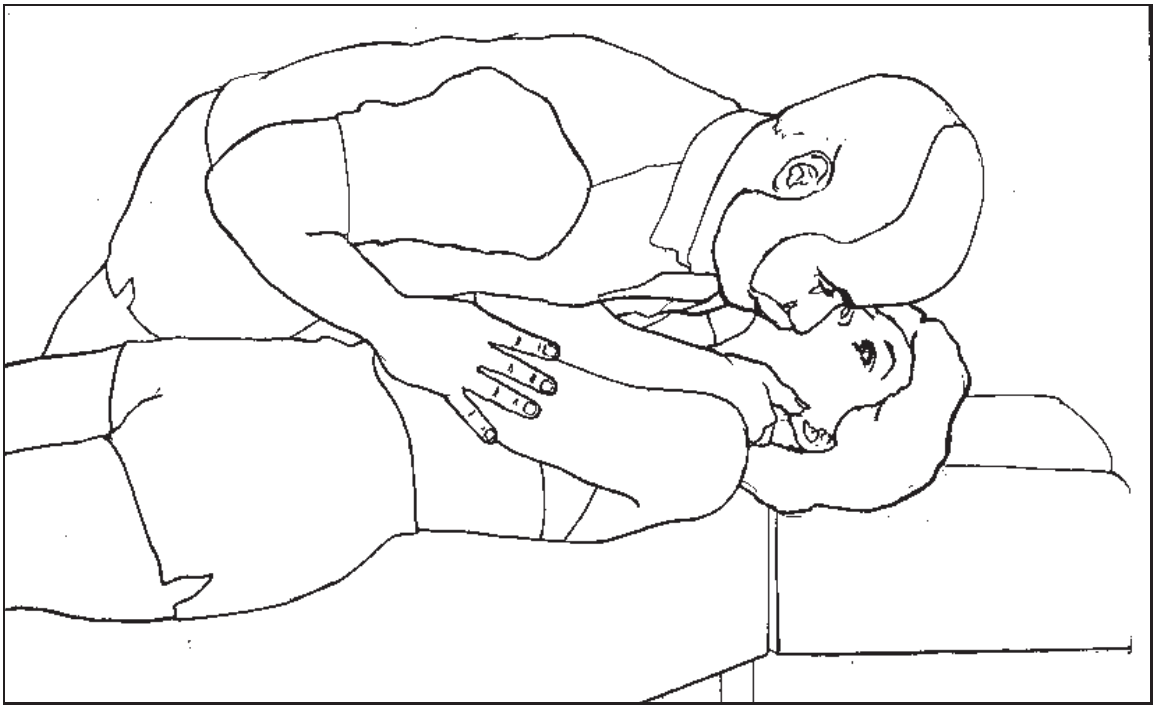


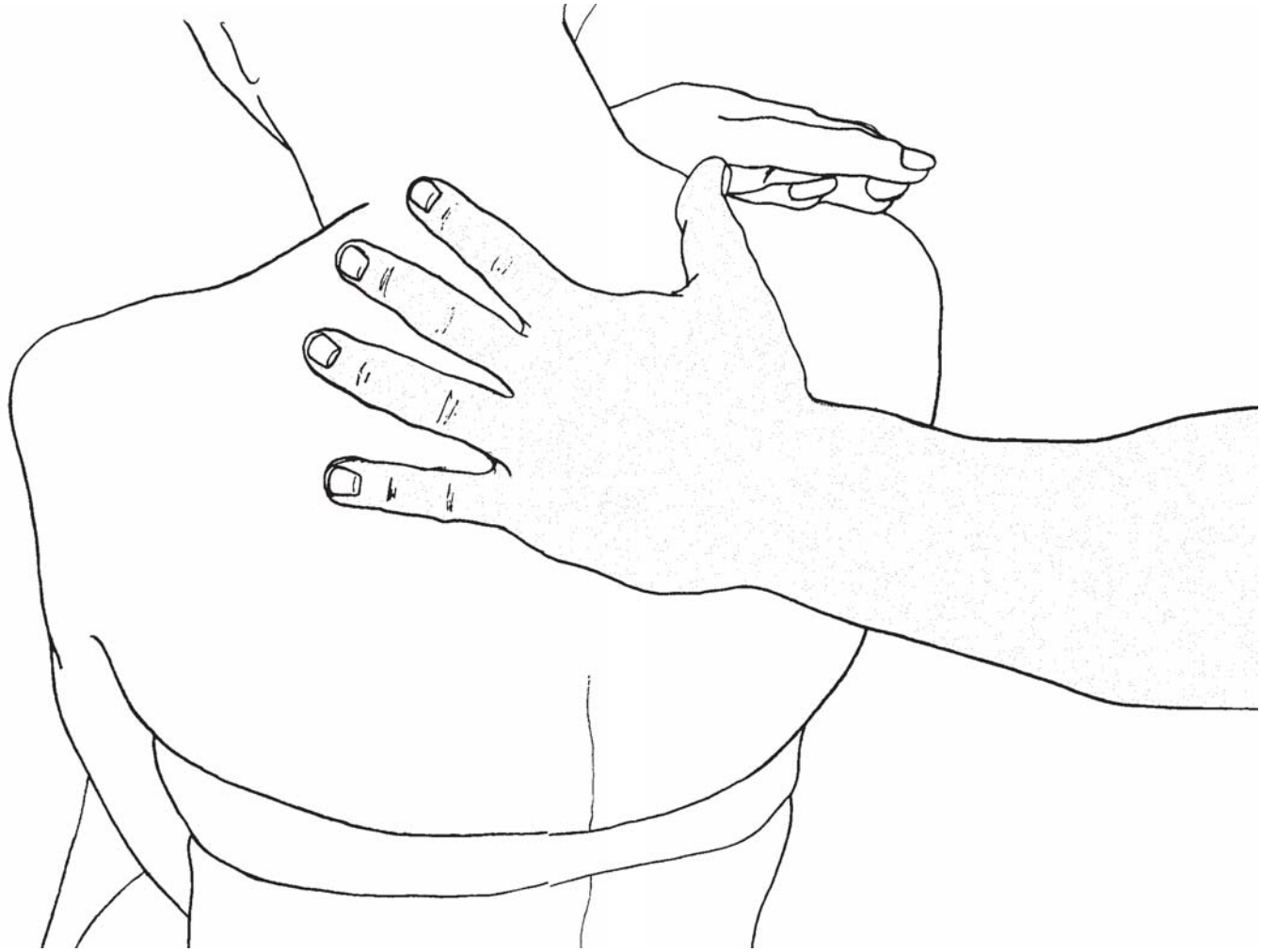
ANTERIOR DORSALS T6-4

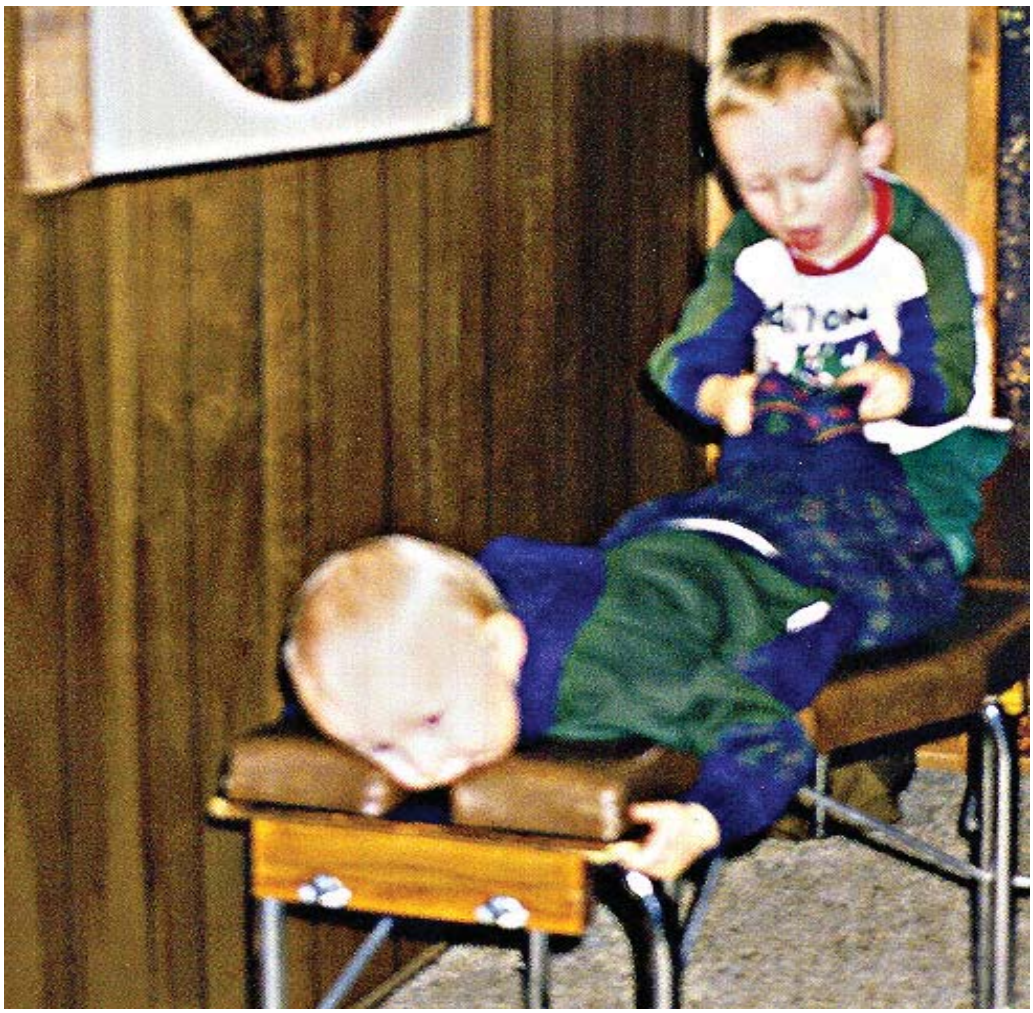
The patient is laid back onto your stabilization hand. Note that the contact hand is on the bottom elbow for the thrust of the arm into the ribs, which are moving the vertebrae posterior. This position requires less thrust than the top elbow.

ANTERIOR DORSALS T6-4

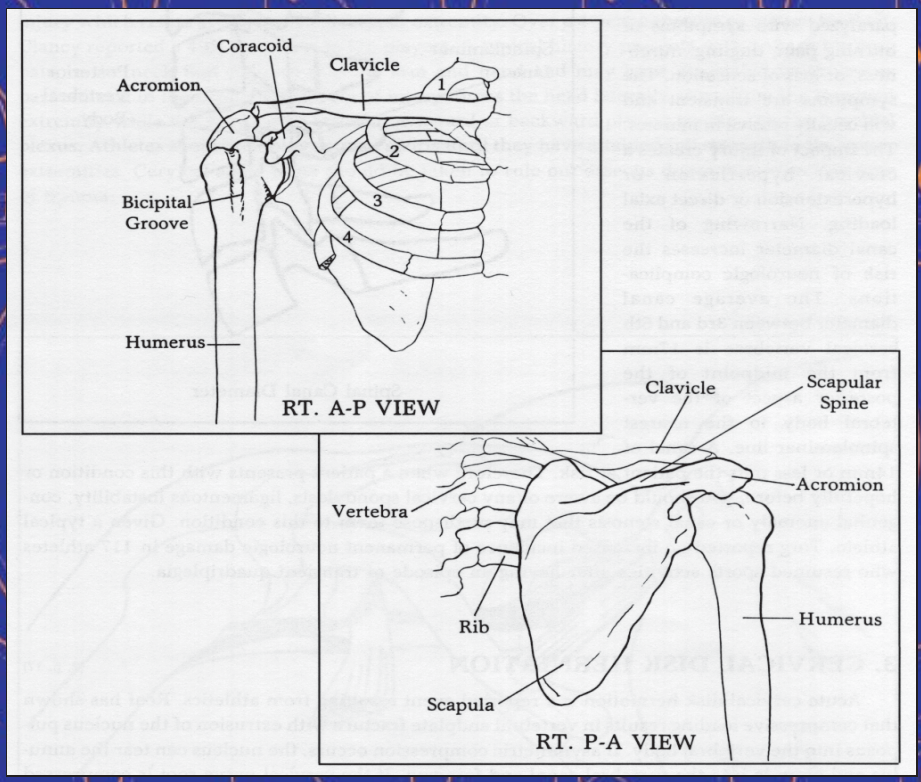
Thrusting is performed by leaning over the patient and utilizing a gentle body drop through the contact hand on the bottom elbow toward the stabilization hand in back of the patient.







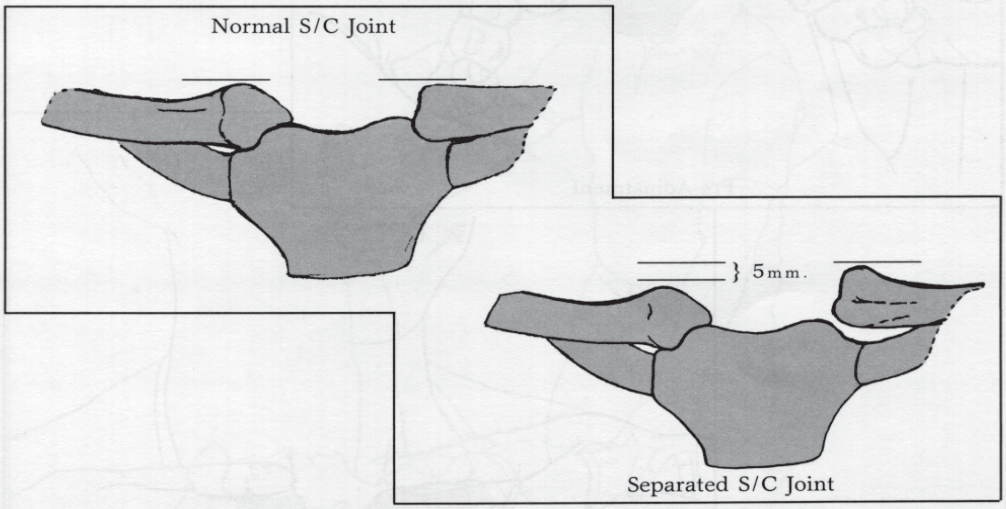
SHOULDER GIRDLE



SHOULDER GIRDLE

(2, p. 23; 3, pp. 388, 398; 6, p. 920)

Discussion: The shoulder girdle is a very prominent part of your body that has a high likelihood to get injured because it extends farther out than the rest of your body. Its propensity for injury is amplified because there is only one bone (the clavicle) that holds it away from the rest of the body. The compressive forces of all the muscles trying to hold it onto the body, such as the pectoral muscles, the rhomboids, the serratus and the trapezius muscles, to name a few, help to keep it in position. The scapula has a stabilizing influence as it presses against the thoracic cage. However, if the clavicle is unstable, the whole shoulder girdle is unstable.

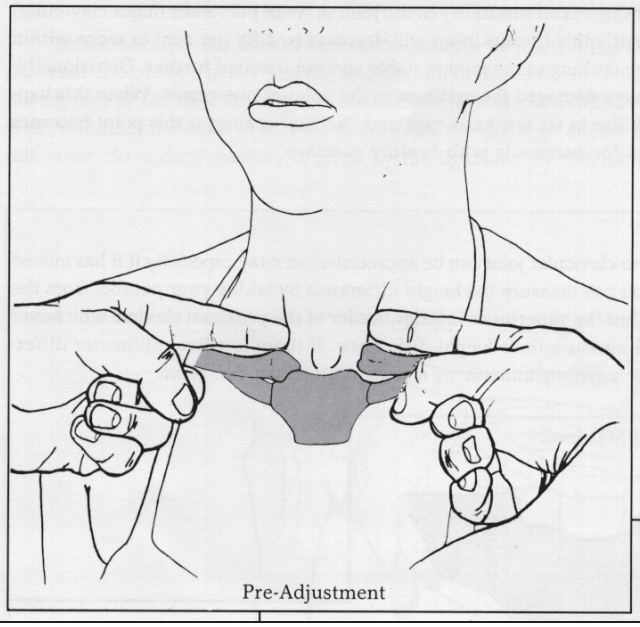


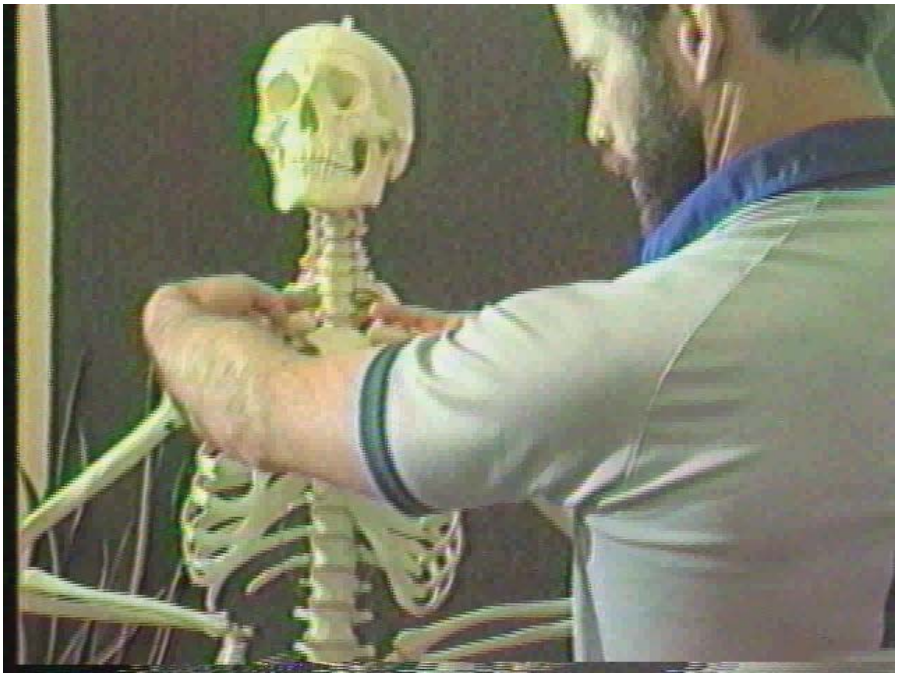
Three Directions of Separation

The S/C joint can go in three directions: superior, inferior or anterior. Typically it does not move posterior because there is the first and second rib behind it. If it does move posterior it usually moves the ribs with it and this can be an emergency situation in that it may occlude the carotid or jugular arteries or veins. So what will typically walk into your office will most likely be either an anterior, superior or inferior S/C joint.

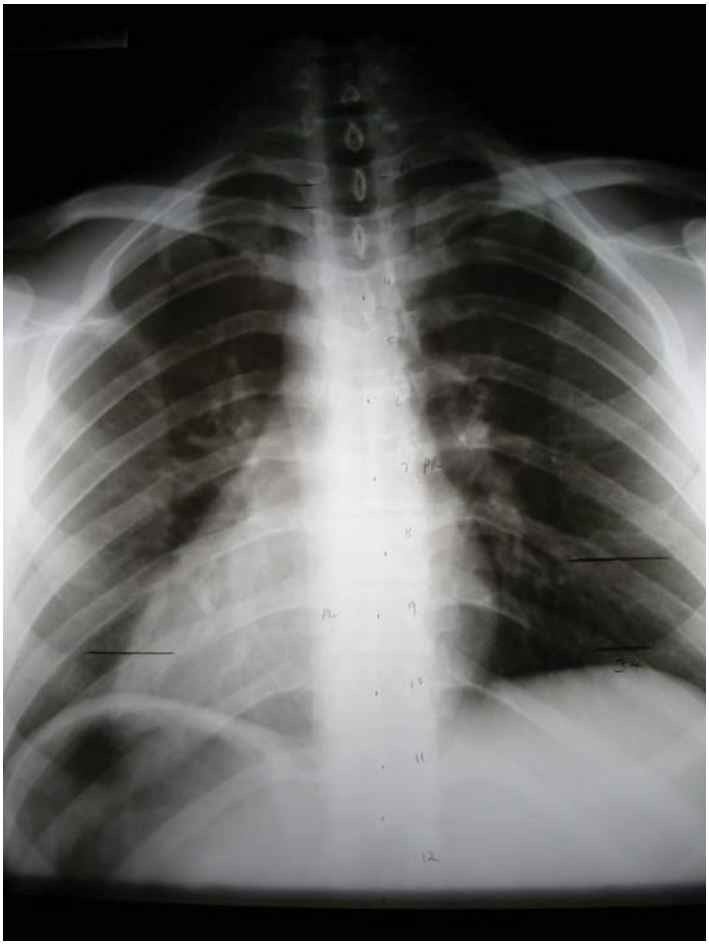
Visual Detection

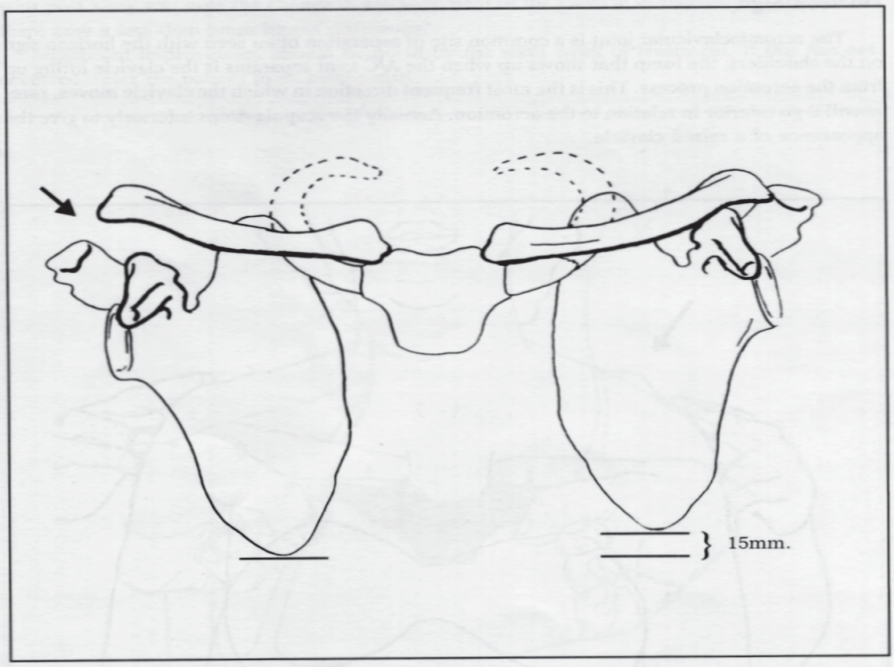
Besides x-ray, the sternoclavicular joint can be observed visually by standing in front of the patient and placing the back of your index fingers on top of the clavicles at the sternum. Measure the height difference in your fingers. You can do this pre and post adjustment and notice the significant change in their alignment.





SC00A





ORTHOPEDIC TEST:

CROSS OVER MANEUVER: The involved arm hand reaches over to the opposite shoulder. This compresses the A/C joint. Presence of superior pain in the shoulder or discomfort confirms pathology at the A/C joint.

CLAVICLE - 5mm difference in height or greater = Separation

STERNAL-CLAVICULAR - Ant., Inf., Sup.

Muscle = Pect. Maj. Clav.

IND. - Often accidentally discovered after complaints of general shoulder pain and weakness - tender and prominent at articulation.

P.P. - Supine, approx. 45 degrees on side facing away from Doctor.

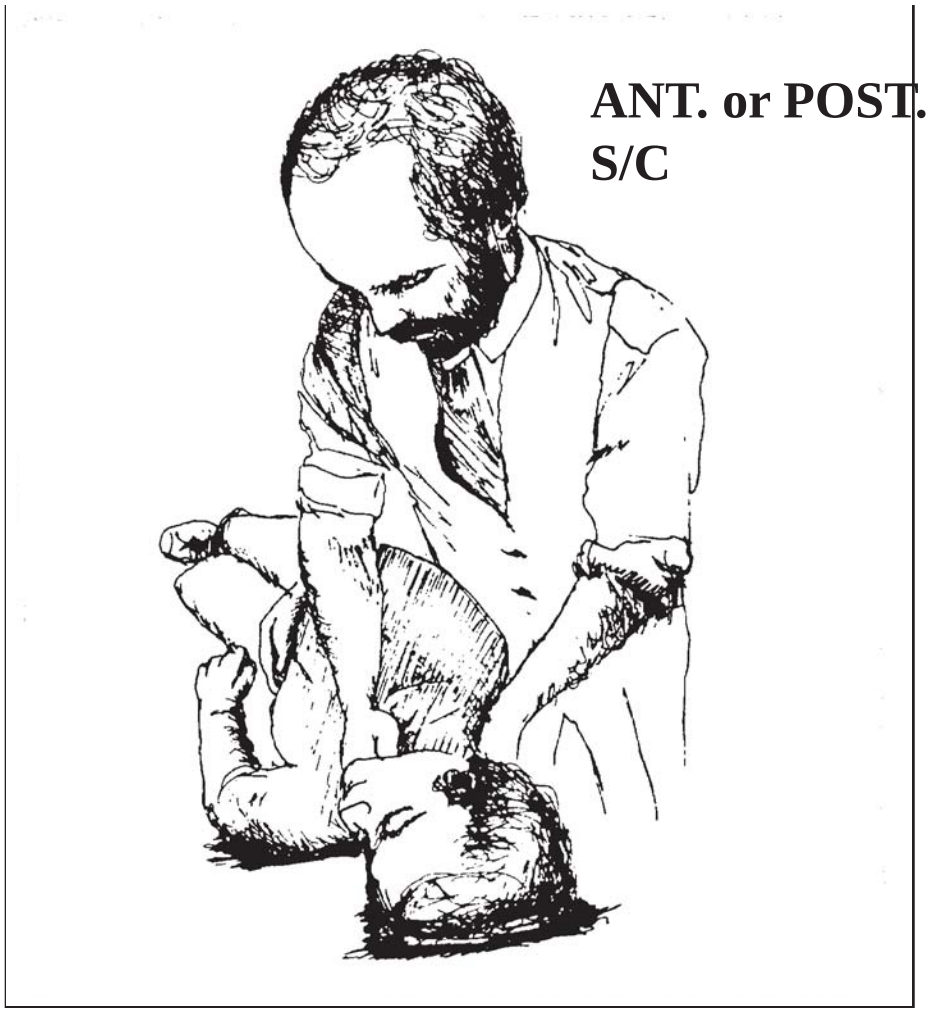
D.P. - Opposite side facing patient.

S.C.P. - Medial, anterior head of proximal clavicle.

S.H. - Cephalad hand supporting neck of patient.

C.P. - Pisiform of caudad hand.

L.O.C. - M-L, A-P. Forearm of contact hand should be almost parallel to chest so as to slip off clavicle once it's set in place.



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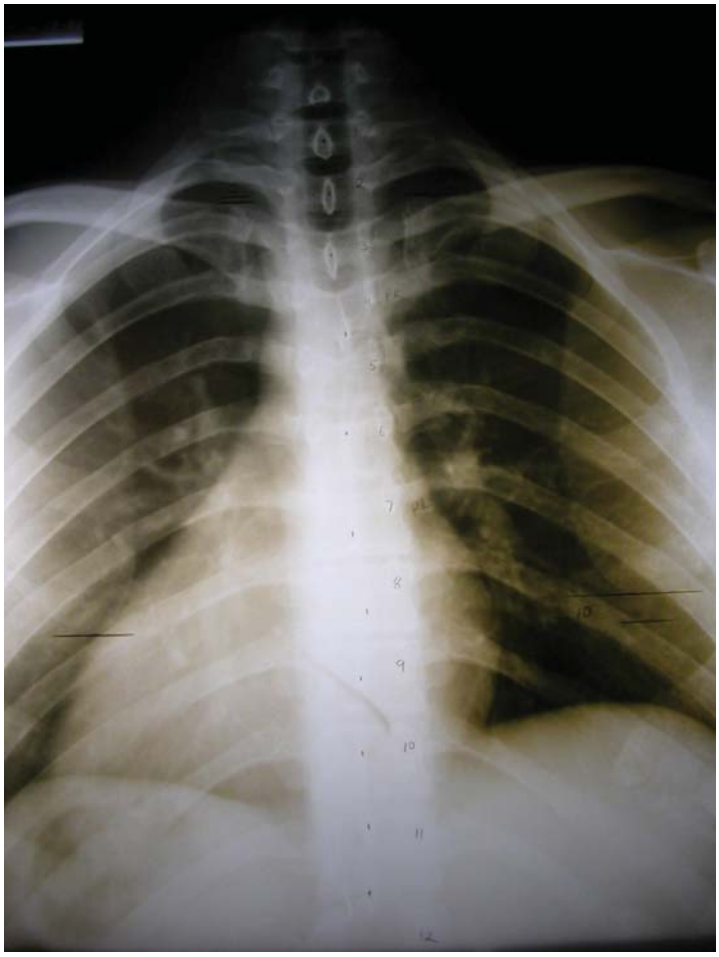


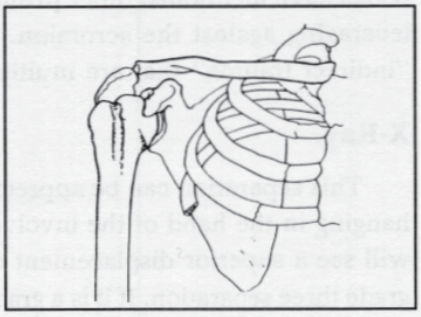
ACROMIOCLAVICULAR JOINT

(2, pp. 70, 71, 169-179)
(18, pp. 63-73)

Coracoid to clavicle distance = 1.1 to 1.3 cm. = normal

A space of more than 1.3 cm. between the coracoid and the clavicle = coracoclavicular ligamentous disruption.

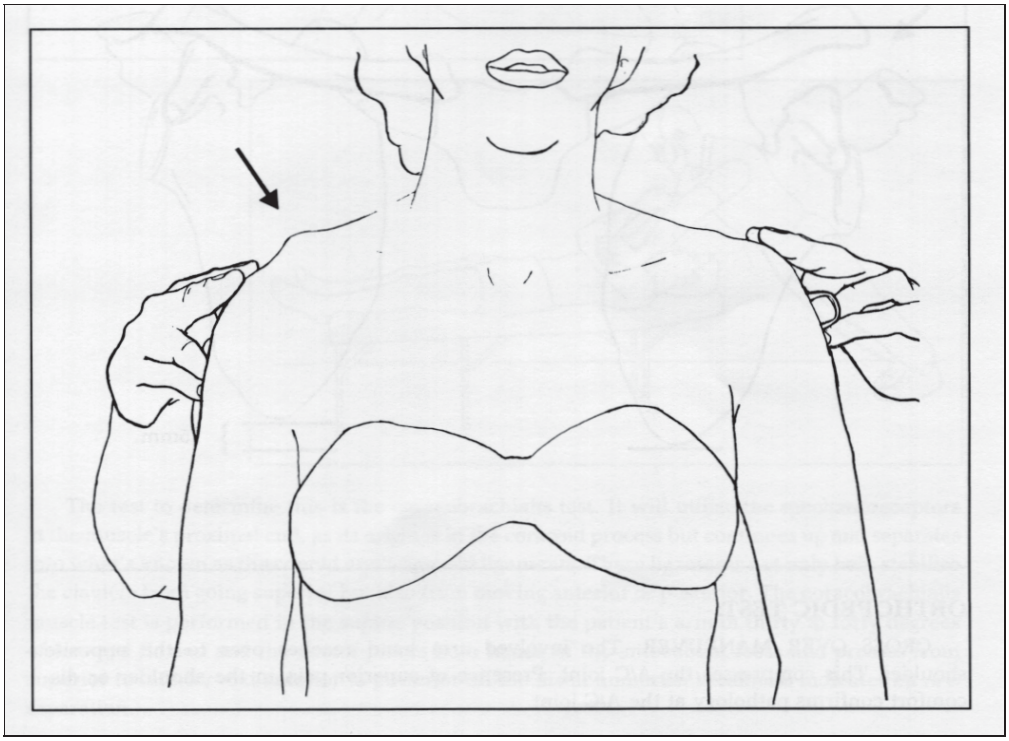
(2, p. 107)



Horizon Sign

The acromioclavicular joint is a common site of separation often seen with the horizon sign on the shoulders, the lump that shows up when the A/C joint separates is the clavicle lifting up from the acromion process. This is the most frequent direction in which the clavicle moves, rarely will it go inferior in relation to the acromion. Actually the scapula drops inferiorly to give the appearance of a raised clavicle.

HORIZON SIGN



A/C - ACROMIO-CLAVICULAR - Sup. If the coracoclavicular distance is greater than 1.3 cm = separation.

Muscle = Corocobrachialis.

IND. - Comparative anatomy of both shoulders demonstrates an obvious protuberance superiorly along horizon of shoulder on involved side. Pain or crepitus with hypermobility is indicative of a fairly recent injury. Caution should be taken if injury has existed 3 months or longer as fibrosing may have created a permanent misalignment and in this instance manipulation is contra indicated if the corocobrachialis tests strong.

P.P. - Sitting with elbow abducted.

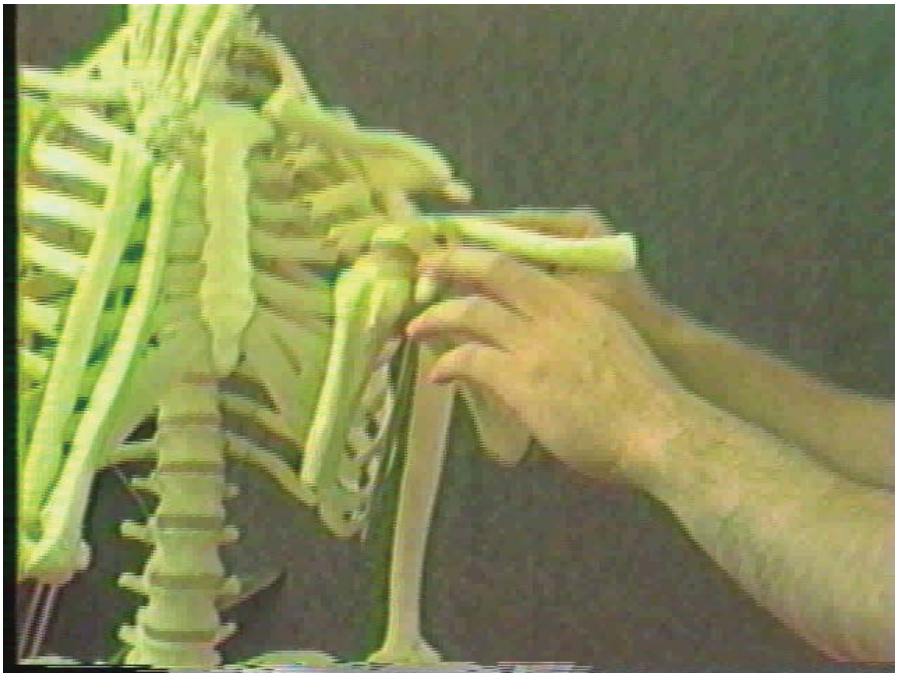
D.P. - Behind patient on involved side.

S.C.P. - Distal superior surface of clavicle.

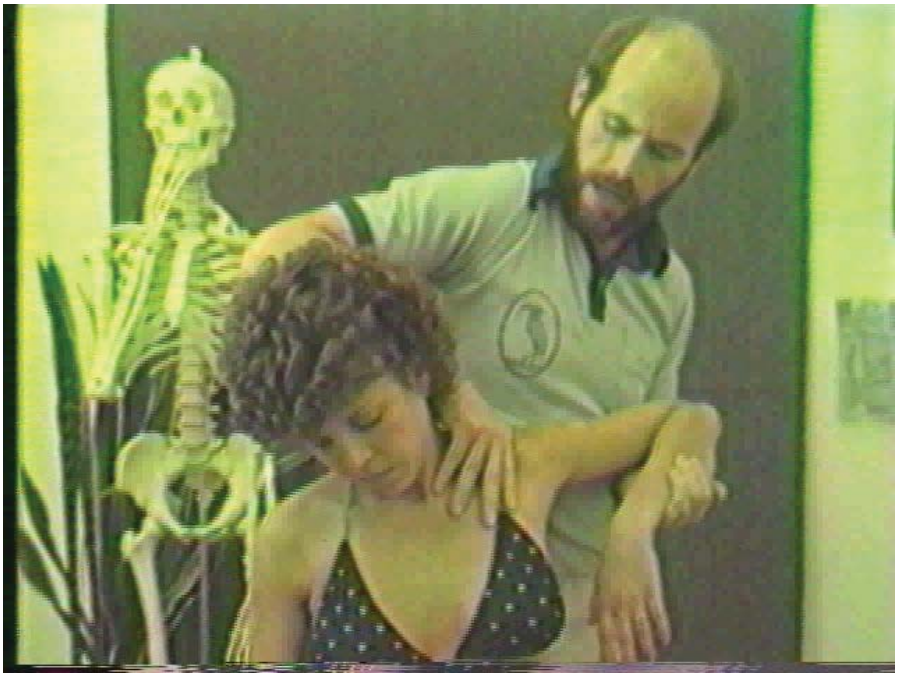
S.H. - Cradle elbow of involved side with same side forearm and hand.

C.P. - Metacarpal phalangeal pads of index and middle fingers.

L.O.C. - S-I, usually P-A or A-P as needed. Once set and if hypermobile, a clavicular reduction sling or taping of clavicle is indicated.



AC1



AC2

Grading of A/C Sprains

The conoid and trapezoid ligaments are contiguous with the origin of the muscles attaching to the coracoid process and reach up from there to the clavicle both anterior and posterior as stabilizers holding the scapula and clavicle together.
These two bones will separate if these two ligaments get torn.
Therefore it can be determined to what extent the tear is by these tests below.

Grade 1 – No Horizon Sign. Coracobrachialis muscle tests weak.

Grade 11 – Horizon Sign present with motion of the clavicle when muscle testing the coracobrachialis due to partial attachment of the conoid and trapezoid ligaments. Coracobrachialis muscle tests weak.

Grade 111 – Horizon sign present with no motion of the clavicle when muscle testing the coracobrachialis due to total disruption of the conoid and trapezoid ligaments. Coracobrachialis muscle tests weak.

SCAPULA - Inf. - If the scapula height difference is greater than 15mm = unstable shoulder girdle.

IND. - Comparative anatomy demonstrates a low scapula on involved side, usually resulting from a fall.

P.P. - Prone with involved arm at 90 degree flexion of the elbow behind their back.

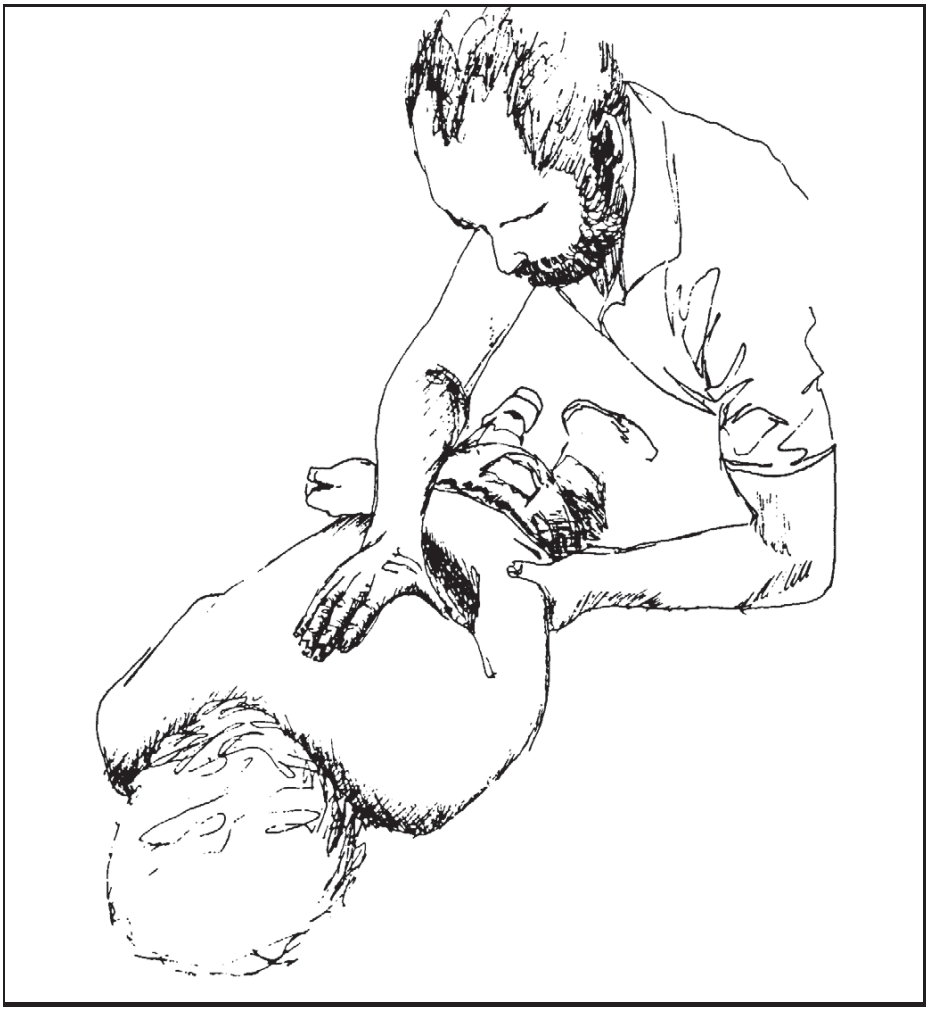
D.P. - Same side of lesion facing cephalad.

S.C.P. - Inferior angle of scapula.

S.H. - Lateral hand grasping flexed elbow of patient.

C.P. - Medial hand web - cradling inferior angle of scapula.

L.O.C. - I-S. Accomplished by pushing the elbow medially while forcing the scapula superiorly.



SCAPULA2

THE END

T.M.J., RIBS, SHOUDER GIRDLE