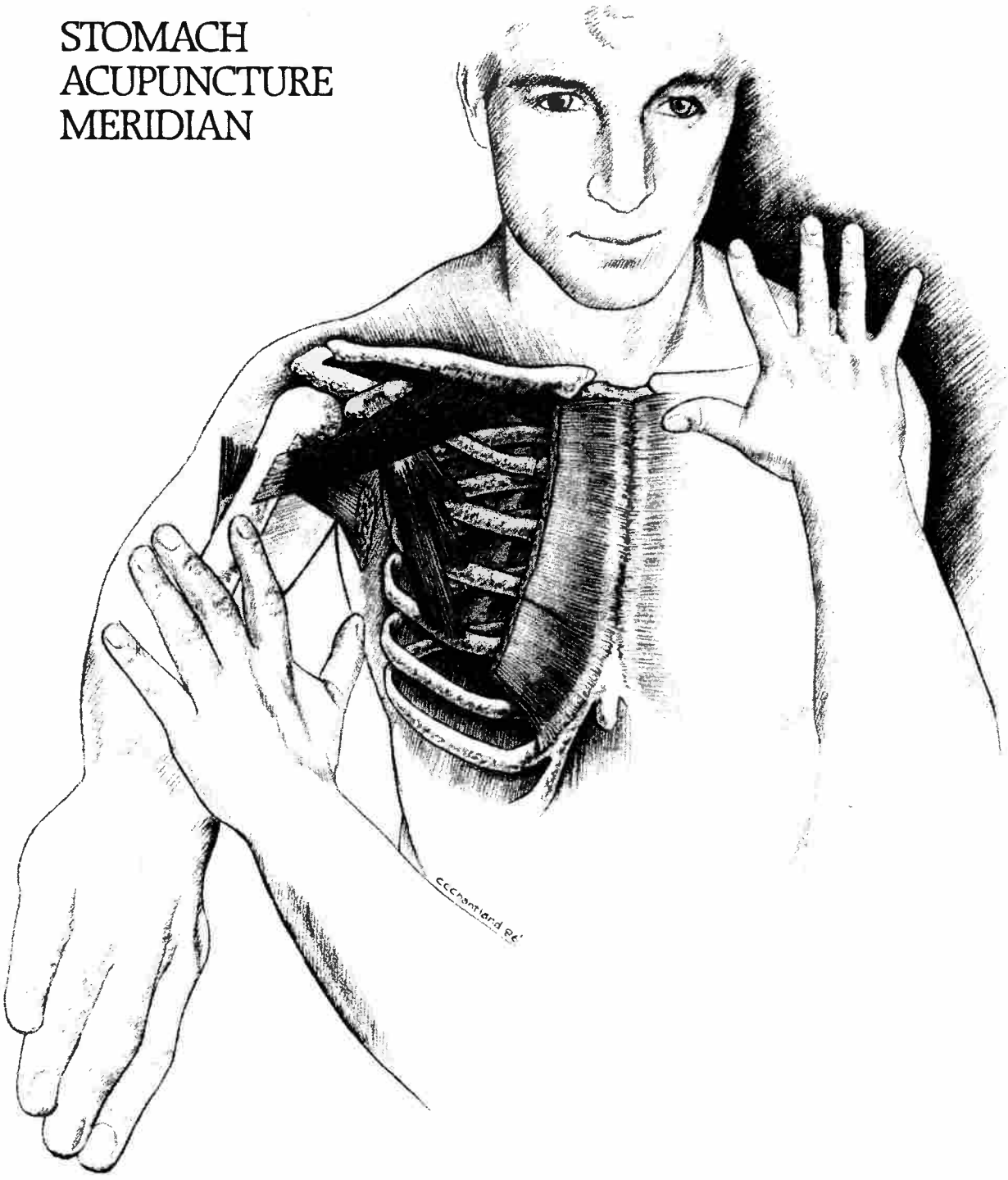
APPLIED PHYSIOLOGY
International Journal

# PECTORALIS MAJOR CLAVICULAR

STOMACH
ACUPUNCTURE
MERIDIAN



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**DEDICATION:**

A special thank you to all the people supporting the Applied Physiology Publishing goals for their support and pledges. This first muscle chapter is given with love to all that care.

Love,

# PECTORALIS MAJOR CLAVICULAR

The pectoralis major muscle is located on the frontal chest wall. It provides structural protection to the upper chest along the sternum, up to and including, the medial half of the clavicle. This muscle is divided into two sections, the clavicular segment and the sternal segment. The clavicular portion is innervated by efferent nerve fibers originating from the 5th, 6th and 7th spinal segments, through the bracial plexus and on into the lateral pectoral nerve bundle to the muscle.

The pectoralis major clavicular (PMC) originates from the anterior half of the sternal end of the clavicle. It extends laterally across the lower borders of the acromian process where its spindle cells predominate, tucking under the anterior deltoid and inserting to the lower half of the lateral bicipital groove of the humerus.

The insertion of the PMC is crossed under and upward on the humerus to the greater tubercal by the pectoralis major sternal (PMS). This insertion is just lateral on the humerus to the insertion of the latissimus dorsi which is just lateral to the teres major. The insertion of the subscapularis is superior and medial, while the insertion of the deltoid is inferior and parallel to the PMC.

# PRIMARY RANGE OF ISOLATED MOTION

The PMC's primary range of isolated motion is quite interestingly taken for granted. Most often the PMC is ignored for its much larger counterpart the PMS. For many years, the majority of researchers combined the pectoralis major as one muscle. In today's society, body builders use muscle burning techniques to expand extrafusal muscle fibers of the PMS to be adorned by the glimpse of an eye rather than toning fibers for endurance purposes. It should be noted that toning this muscle group, and in particular the PMC, will add a greater degree of coordinated muscle movement.

The PMC, though not noted for its bulk, plays a major role in shoulder stabilization. At its origin, this muscle braces the sterno-clavicular joint, along with the sterno-clavicular ligament and directly below that the costo-clavicular ligament.

Due to its location, the PMC acts to coordinate shoulder movement. An example of this coordination is clearly evident in the swinging of a baseball bat. When a right-handed batter assumes the batting stance, the following would be observed. The left PMC is fully contracted, while the right PMC is partially extended. At the moment the decision is made to swing, the right PMC and PMS would facilitate concentric contraction as well as the right antagonistic group on the scapula inhibiting or letting go into this motion, while the left PMC and PMS would inhibit into extension. Simultaneously, the left PMC and PMS antagonists attaching to the scapula would be facilitating contraction. When the controlling muscle, the PMC, is in homeostasis, it allows the rest of the shoulder to bring the bat around on a level plane. In this example, the right PMS would generate the force of the swing, while the ipsilateral PMC would act to facilitate accurate control of the bat. It should be understood at this point that other muscles are facilitating and inhibiting during this process. It is our aim to focus upon the pectoralis group.

Many professional and collegiate baseball players often assume that a batting slump exists because a series of events has superstitious overtones. In my clinical observations of these ball players, this is not true. When in fact their batting slump is a direct result of any combination of four different stress conditions. Two of the four stress situations, hypo and/or hyper, bilaterally and/or ipsolaterally, will appear when the following conditions are observed. An attitudinal imbalance is noticed when the batter will swing up into the ball or down onto the ball continuously creating pop-ups and ground balls rather than line-drives. A sloppy movement occurs and batters will tend to overswing and lose balance, such as what Reggie Jackson is notoriously famous for. A reactive muscle condition will often occur at the muscles in the wrist, in particular around the capitate bone (the center of gravity to the wrist), facilitating dropping of the bat. One more observation is that these hitters often pull the ball to left field, but more often than not, hit the ball foul left of third base.

The other two stress states, hypo and/or hyper frozen, will present themselves in the following situations. The batter will find it difficult to follow through and will often display a choppy, hesitant swing. Most often in this situation, they will hit line-drives, but usually to the opposite fields. It is also observed that these hitters are late in getting around on pitched fast balls and strike out frequently.

The results of the frozen condition for prolonged periods of time will eventually show up in a difficult to correct posture deviation known as hunchback or hunched shoulder. The shoulders will appear to draw forward and upward as the scapula abducts or pulls away from the spine.

The tiny pectoralis minor is assisted by the many fibers of the anterior serratus in abducting the scapula upward and away from the vertebrae. The entire pectoralis group, major and minor, will be hypo and/or hyper frozen developing this postural deviation.

# ARCHITECTURE OF THE SHOULDER

## SYNERGISTS

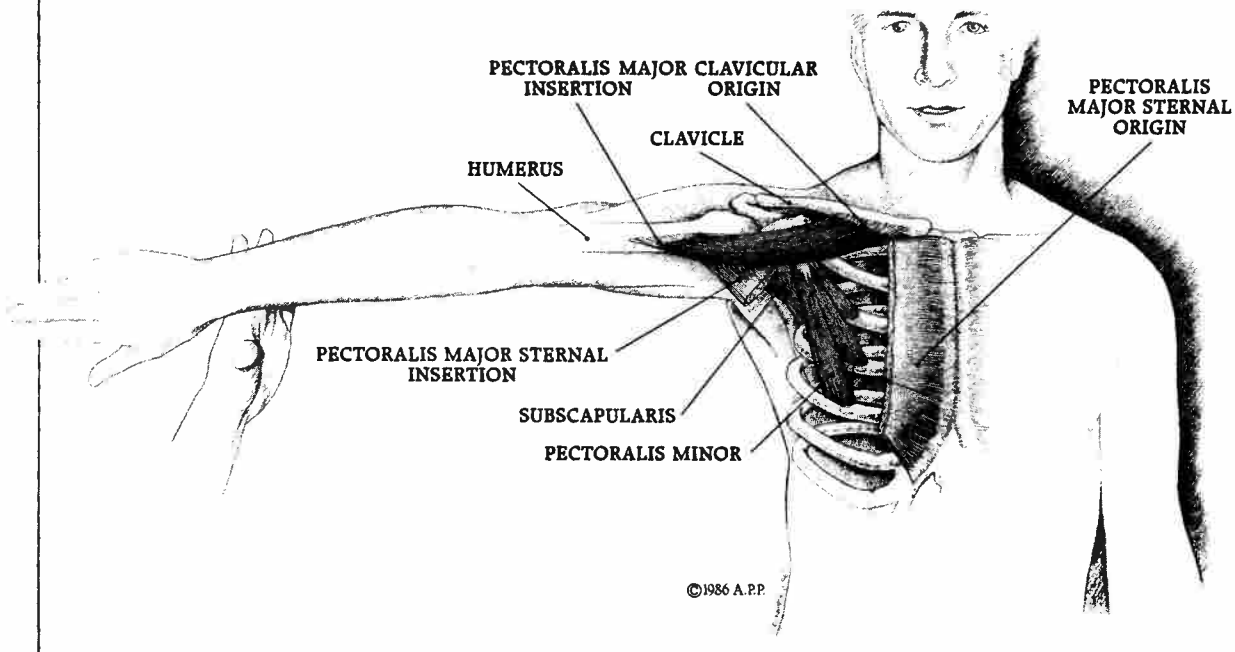
The shoulder is primarily made up of three bones, with the clavicle in the front, the scapulae in the back and the humerus extending from the main frame. The shoulder movement is quite extensive and requires a tremendous amount of neurological integrity and integration. The discussion of the PMC, its synergists and antagonists, for purposes of this chapter are limited to the test range of motions described in this text.

The original design is quite impressive. The muscle involvement is synchronized via nerve routes to the brain so that the arm can have great dexterity and range of motion. The PMC and PMS attach to the clavicle and sternum supporting the clavicle on the medial end. Together they adduct the humerus forward by working synchronously with the teres major and latissimus dorsi. These are the major synergistic muscles used with the PMC in shoulder adduction and rotation. The subscapularis, often times considered a prime synergist, rides so high on the humerus medial to the pectoralis major muscle, that it provides but just a little assistance in medial rotation. Its primary function is to hold the humerus in the glenoid cavity. The pectoralis minor reaches up under the pectoralis major from the rib cage on the front to the middle of the coracoid process. When the PMC activates, the pectoralis minor pulls the top of the scapula forward and away from the spine. The scapula is abducting at the same time the humerus is adducting. The subclavian muscle adds integrity and stability to the PMC providing it with more control by limiting its upward movement.

# SYNERGISTS TO PMC

| Medial Rotation | Adduction |
|---|---|
| Teres Major | Pectoralis Minor |
| Subscapularis | Coracobrachialis |
| Latissimus Dorsi | PMS |
| PMS | Triceps Longhead |
| Anterior Deltoid | Anterior Serratus |
| Etc. | Latissimus Dorsi |
| | Etc. |

**Origin:** Anterior surface of the medial half of the clavicle.
**Insertion:** Lateral lip of the bicipital groove of the humerus.
**Action:** Pulls the humerus toward the midline of the body. Assists in medial rotation.




# ANTAGONISTS

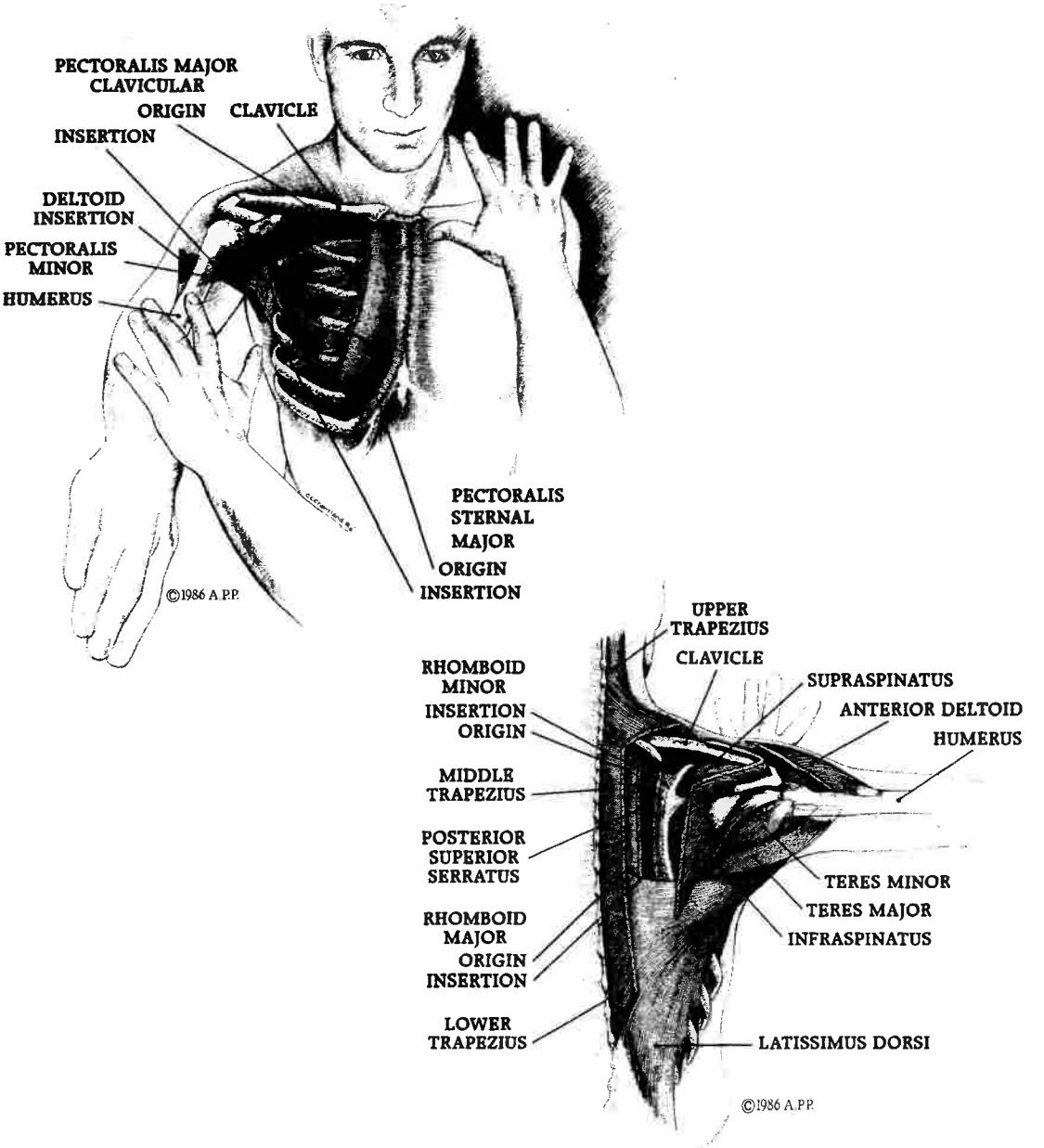
The antagonistic action of the PMC is lateral rotation and lateral abduction. The teres minor, supraspinatus, posterior deltoid, and infraspinatus reach out from various locations on the scapula to accomplish this action. Synchronously the rhomboids, mid, upper and lower trapezii and levator scapulae draw the scapula inward and upward toward the spine and the skull. These secondary antagonists by comparison to the direct antagonists assist in shoulder abduction by pulling the scapula toward the spine giving strength to the muscles attaching from the humerus to the scapula.

In lateral rotation, the posterior deltoid, teres minor, supraspinatus, and infraspinatus bring the humerus to full lateral rotation.

# ANTAGONISTS TO PMC

**Lateral Rotation**
Posterior Deltoid
Teres Minor
Supraspinatus
Infraspinatus
Etc.

**Abduction**
Posterior Deltoid
Teres Minor
Upper Traps
Mid Traps
Lower Traps
Levator Scapulae
Infraspinatus
Supraspinatus
Rhomboid Maj/Min
Etc.



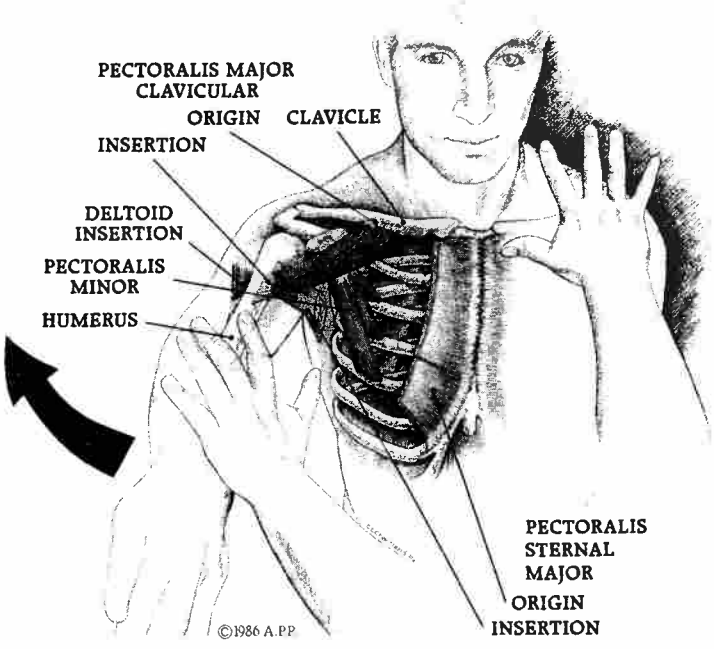
# HYPO TEST: ADDUCTION

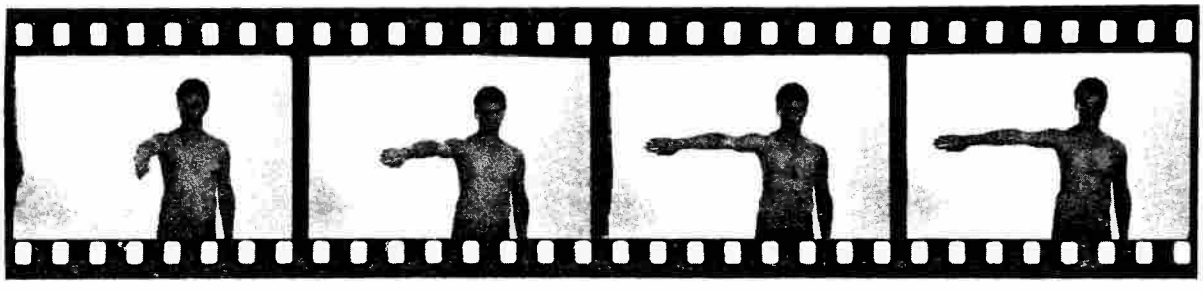
**Position:**

With the back stabilized preferably supine, the arm is fully extended anterior from the body at 90°. The thumb is pointing toward the feet as the elbow is extended and locked. The palm of the hand is facing lateral, while the dorsum of the hand is facing medially.

**Test:**

The tester should stabilize the opposite shoulder as well as the entire back by bracing against a solid object and hold the extended arm at the wrist medially. Apply three to five lbs. of pressure for adequate testing. The direction of pressure will vary. If the testee has a clavicle that is level across his shoulder from the sternum to the acromion, the pressure should be applied directly lateral at 90° from the body. If the clavicle of the testee is at an angle downward from the sternum to the acromion process, the pressure should be directed down and out (toward abduction at a 60° angle). These tests were clinically shown over a period of time to be more accurate than the original 90° PMC adduction test by Kendall et al.



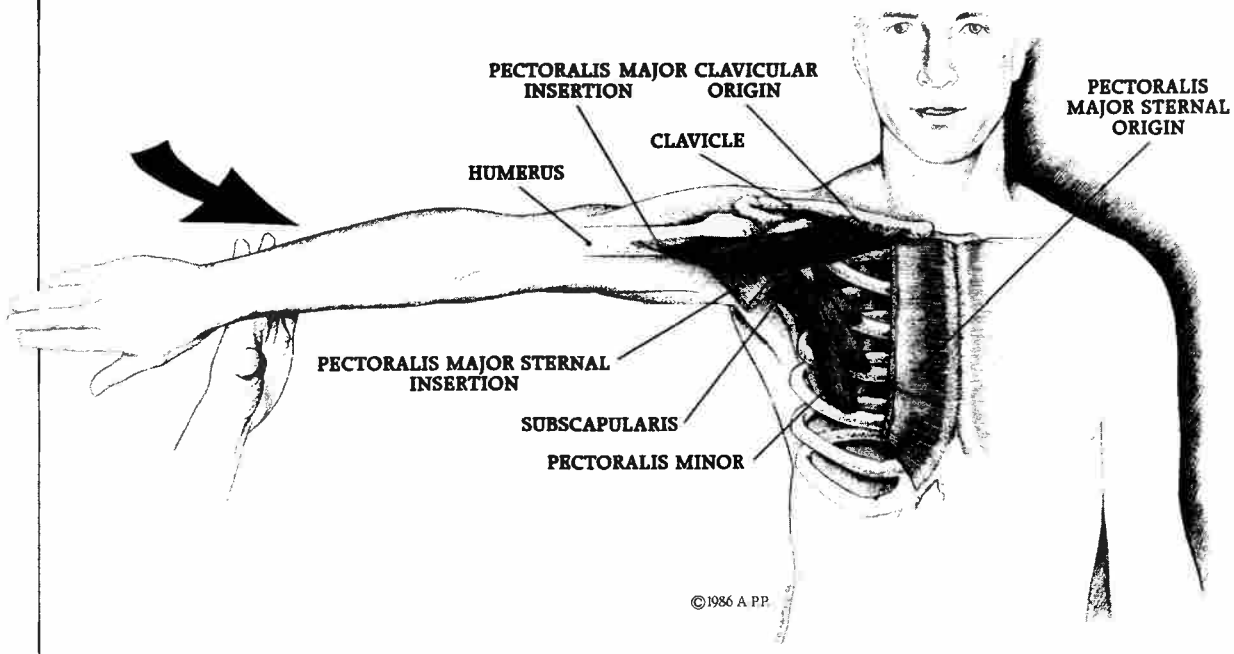
# HYPER TEST: ABDUCTION

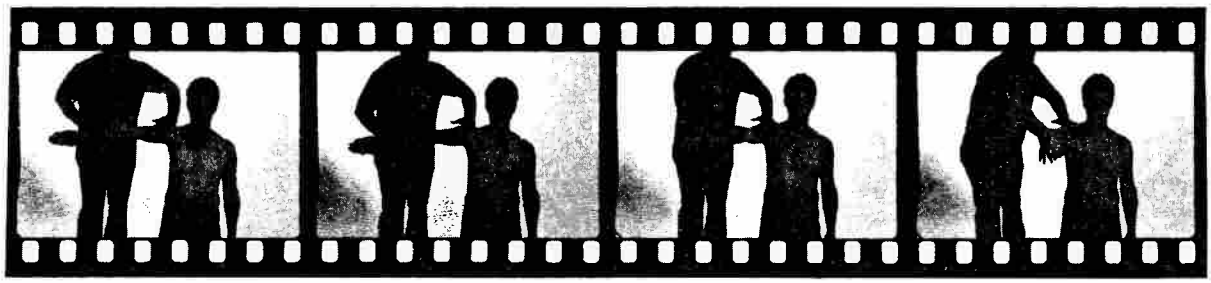
**Position:**

Stabilize the back so that movement of the torso is neutralized while testing. The arm should be laterally extended to the side at 90°, if the clavicle of the testee is level from the sternum to the acromion process. Should the testee have a clavicle that descends from the sternum to the acromion process, the starting position would be to extend the arm inferiorly at 60° lateral from the midline of the body. The thumb should be turned downward with the dorsum of the hand facing anteriorly.

**Test:**

Brace the ipsilateral shoulder while positioning the testing hand on the palm side of the wrist. If the arm being tested is from 90° because of the location of clavicle, add 3 to 5 lbs. of pressure medially, applying force anteriorly (toward adduction). Should the vertical clavicle be observed the arm should be tested from 60° by applying 3 to 5 lbs. of pressure medial and upward toward adduction.



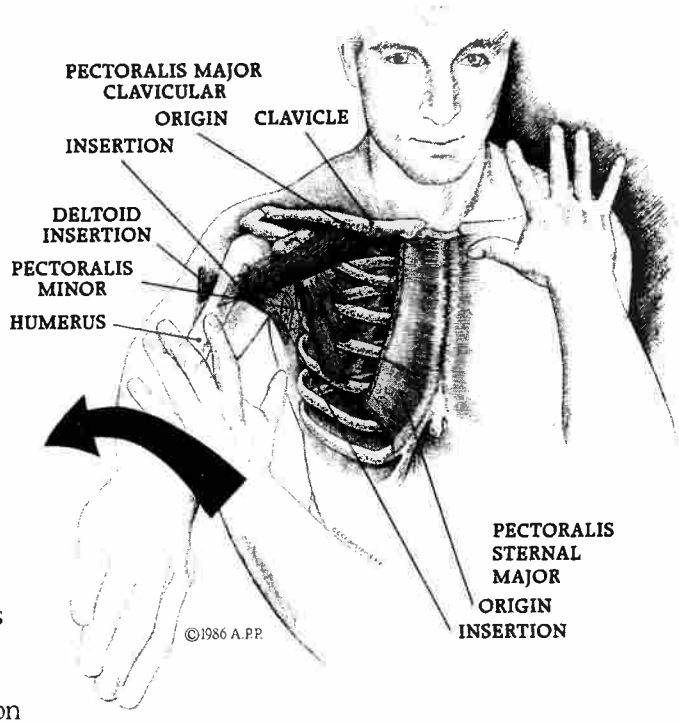
# HYPO TEST: ROTATION

**Position:**

With the arm rotated medially, position the subject's shoulder in a 90° forward extension, bending the elbow 90° medially. The arm should be forward and across the body, with the palm of the hand facing anteriorly and the thumb pointing down.

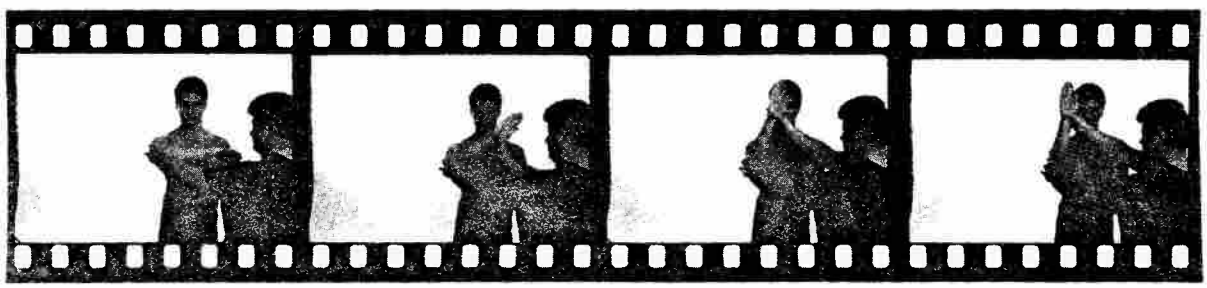
**Test:**

Brace the elbow superiorly while putting the testing hand inferiorly at the wrist. The test is to apply 3 to 5 lbs. of pressure upward and lateral. Do not allow the shoulder to lose its 90° forward position. The humerus will now be rotating laterally. The PMC and PMS will be extending in rotation.




**Note:**

The rotation test is given the PMC nomenclature because the Stomach Sedation and Tonification Points effectuate unlocking from contraction to extension and extension to contraction.



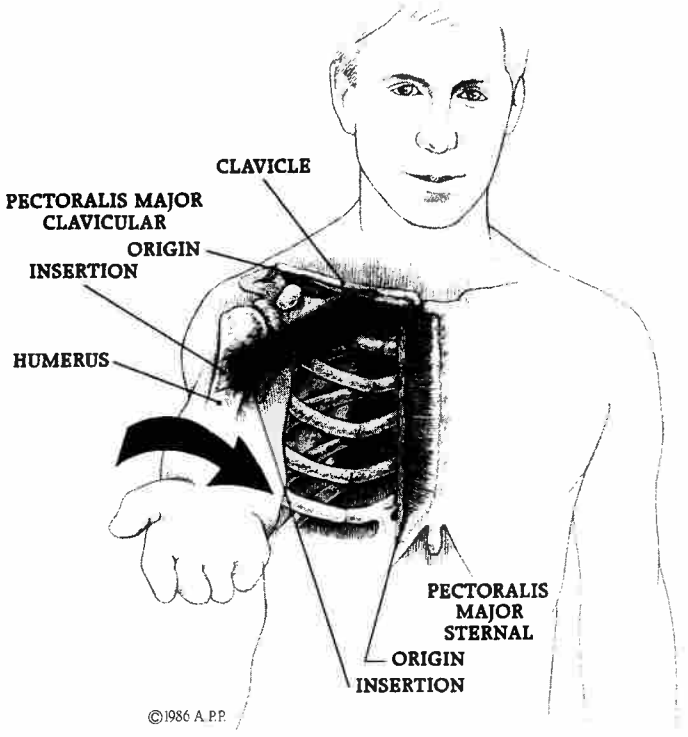
# HYPER TEST: ROTATION

**Position:**

Extend the arm forward at 90° with the palm facing upward and the thumb lateral. Bend the elbow upward and pronate the wrist so the palm of the hand is facing anteriorly with the thumb medial. These test positions were devised to give maximum leverage in testing, thus preventing the test to be done with the arm in full extension by twisting the wrist. It has been proven that rotating the wrist medially for this test is not advantageous due to the fact that it requires too much pressure at the wrist and often creates a carpal tunnel condition.

**Test:**

Put bracing palm of hand medial and inferior to the elbow then apply three to five lbs. of pressure on the lateral side of the wrist in a direction medial and inferior.




# STOMACH

The functions of the stomach are threefold: 1) storage of large quantities of food immediately after eating; 2) mixing of the food with gastric secretions; and 3) emptying of the food from the stomach into the small intestine.

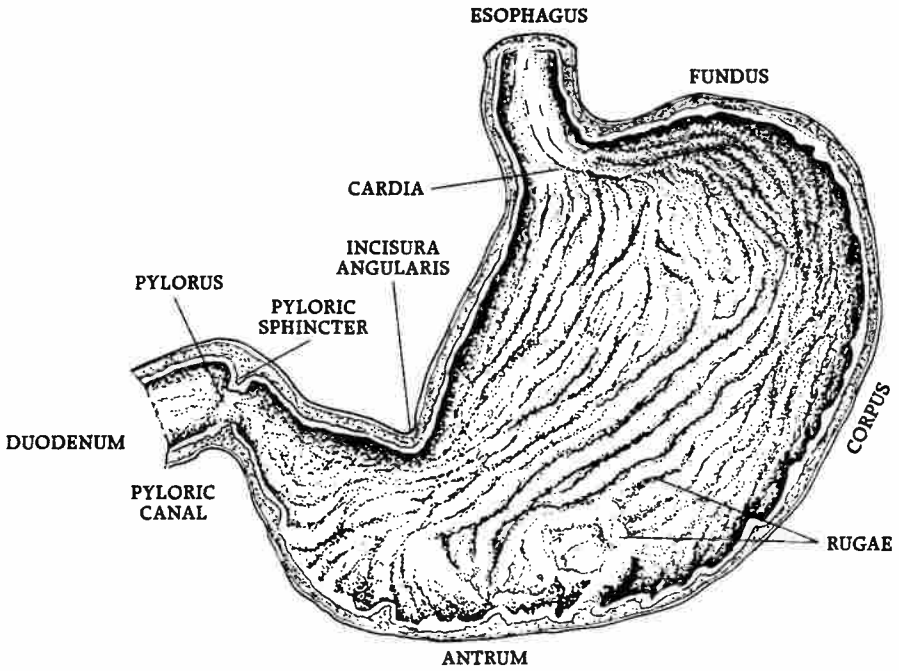
The food that comes from the esophagus first enters into the corpus of the stomach, an area of the stomach which has a high density of gastric glands covering the mucosa. By peristaltic action, the food is mixed approximately every 20 seconds, slowly moving the food towards the antrum of the stomach as chyme. As the chyme reaches the antrum of the stomach, it neurologically triggers signals that food has arrived. The peristaltic pressure now increases at the pyloric sphincter and the chyme is propelled to the duodenum.

The movement of chyme is proportional to its fluidity as well as the amount present in the duodenum. The enterogastric reflex spreads backward from the duodenum to the stomach to inhibit peristalsis when the duodenum is full. This prevents overfilling of the duodenum.

This same enterogastric reflex protects the duodenum from over acidity. When the acid levels are too high, peristaltic action will decrease until the pancreatic enzymes enter the duodenum neutralizing the acid condition. Normal peristalsis will now resume.

Fats in the small intestine will also inhibit stomach action. A hormone called enterogastrone is released into the bloodstream and carried to the stomach to slow the stomach's peristalsis. This allows adequate time for fat metabolism.

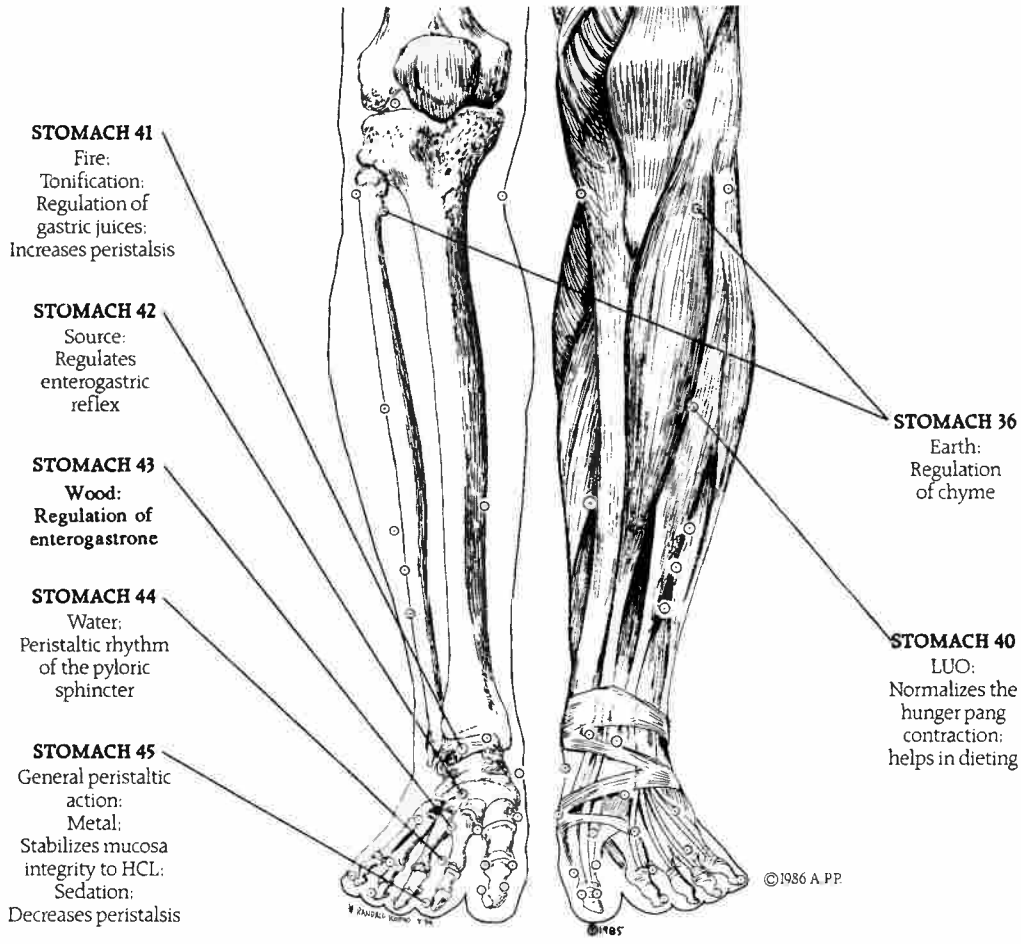
Another type of contraction takes place in the stomach when the stomach has been empty for 6 to 24 hours. These are the powerful contractions that are known as hunger pangs. They last from 2 to 10 minutes causing a tight sensation in the pit of the stomach. This is a natural occurrence. After several days of being empty from fasting these hunger pangs subside.

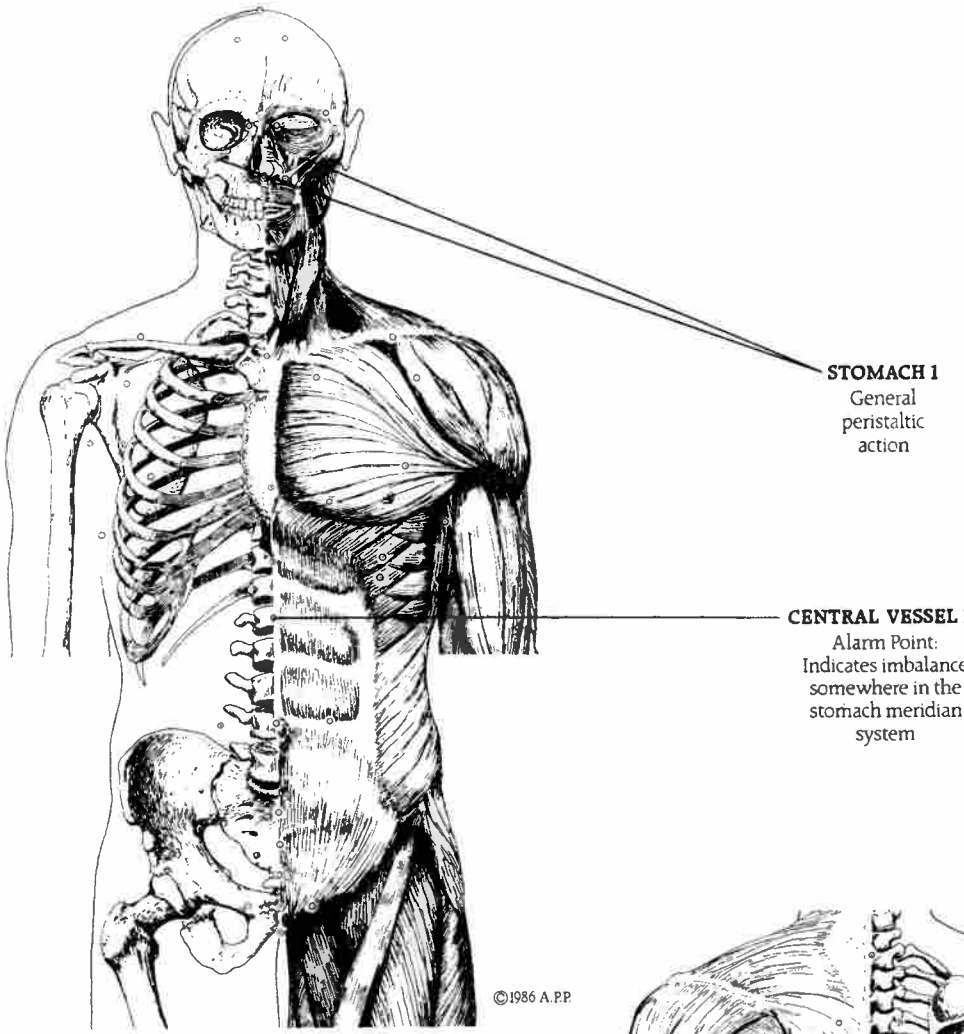


# STOMACH ACUPUNCTURE MERIDIAN

The stomach acupuncture meridian consists of 45 points. These points represent the yang portion of the earth element. Yellow is the color that is represented for this element. Like all meridians, the stomach has a point on the bladder meridian that can store its excess energy. That point is Bladder 21. The stomach meridian's alarm point is Central Vessel 12. Through imperical testing and several years of research, the following acupuncture points have been listed with their corresponding functions. In balancing the physiology of the stomach, it is important that the stress conditons of these acupuncture points be harmonized. The value of balancing these points is no less important than the value of balancing the PMC or any other muscle relating to the stomach's acupuncture meridian. It is important to analyze each of these points for its homeostatic condition.

| | | |
|---|---|---|
| **Stomach 1 & 45** | | General Peristaltic Action |
| **Bladder 21** | Association Point | Overflow Capacitor for Excess Energy from the Stomach Acupuncture Meridian |
| **Central Vessel 12** | Alarm Point | Indicates Imbalance Somewhere in the Stomach Meridian System |
| **Stomach 36** | Earth | Regulation of Chyme |
| **Stomach 40** | LUO | Normalizes the Hunger Pang Contraction—Helps in Dieting |
| **Stomach 41** | Fire | Regulation of Gastric Juices |
| **Stomach 41** | Tonification | Increases Peristalsis |
| **Stomach 42** | Source | Regulates Enterogastric Reflex |
| **Stomach 43** | Wood | **Regulation of Enterogastrone** |
| **Stomach 44** | Water | Peristaltic Rhythm of the Pyloric Sphincter |
| **Stomach 45** | Metal | Stabilizes Mucosa Integrity to HCL |
| **Stomach 45** | Sedation | Decreases Peristalsis |




STOMACH 1
General peristaltic action
CENTRAL VESSEL 12
Alarm Point: Indicates imbalance somewhere in the stomach meridian system
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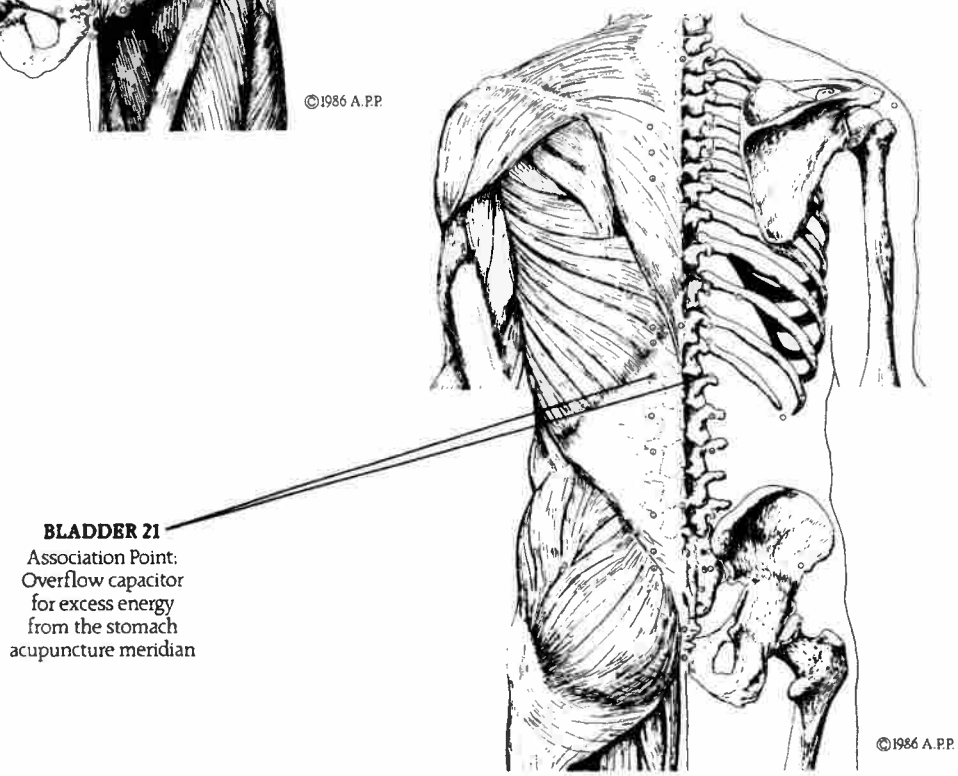
BLADDER 21
Association Point: Overflow capacitor for excess energy from the stomach acupuncture meridian
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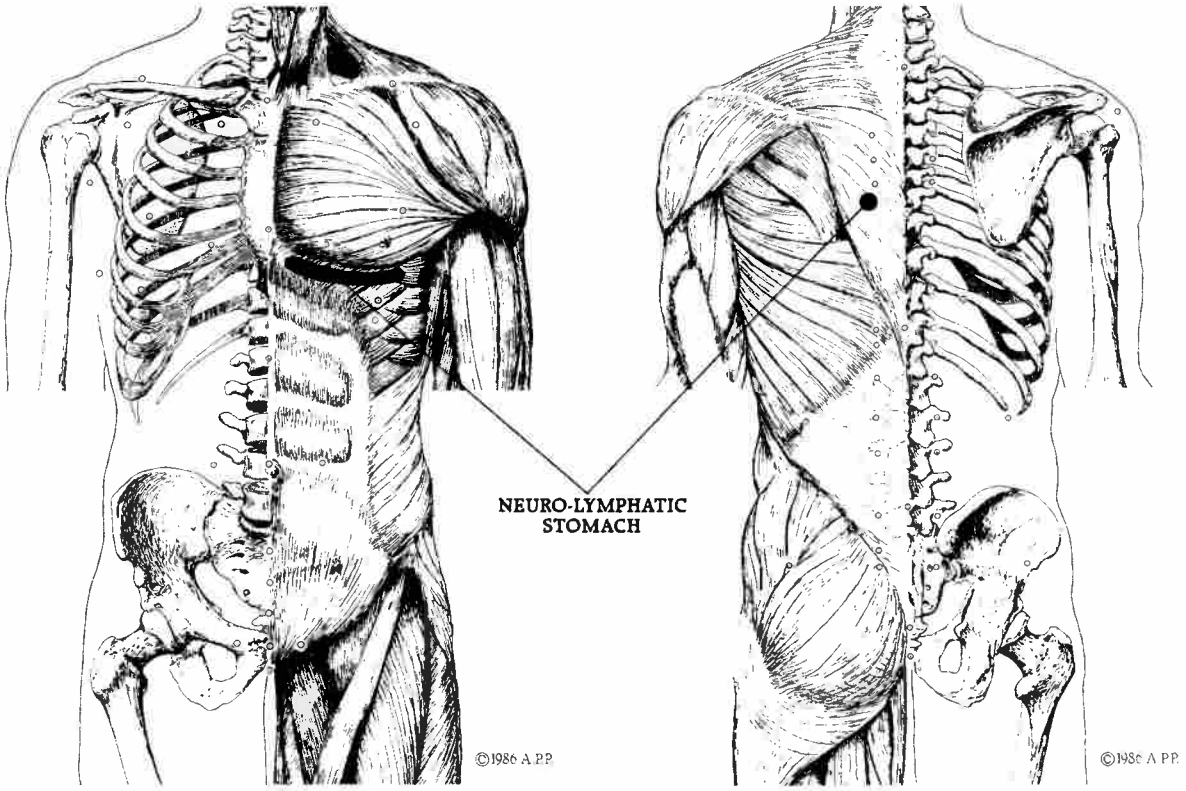
# NEURO-LYMPHATIC REFLEXES

**Location:** Anterior: 6th intercostal space from mamillary line to sternum on the left.
Posterior: Between T6-7 near laminae on left.

This Chapman reflex (renamed the neuro-lymphatic reflex by Goodheart) gives us the stress readout pattern of the nervous system from the stomach related muscles being tested at its nuclear bag with the afferent Primary (anulospiral endings) fibers to the spinal segment. It is imperative while righting the motor function at the muscle level, that the lymph flow around the neural tissue be functional.

This neuro-lymphatic circuit demonstrates two-fold physiology. First, the neurological impulse flow from the muscle to the spinal segment (Schmidt et al.); and second, the facilitation properties of the sympathetic nervous system. The sympathetic nervous system increases motility and tone while stimulating secretions in the stomach. As described in previous chapters, it is important to check these neuro-lymphatics for sympathetic response as well as motor response.

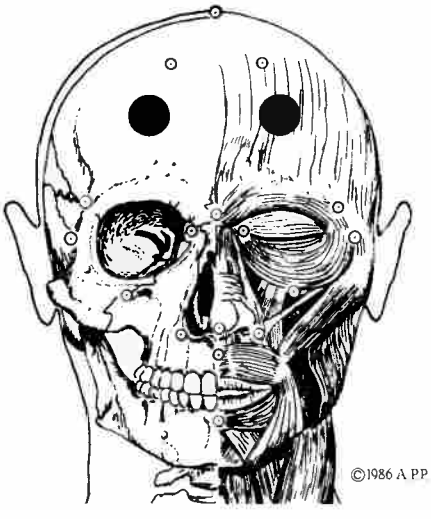


# NEUROVASCULAR

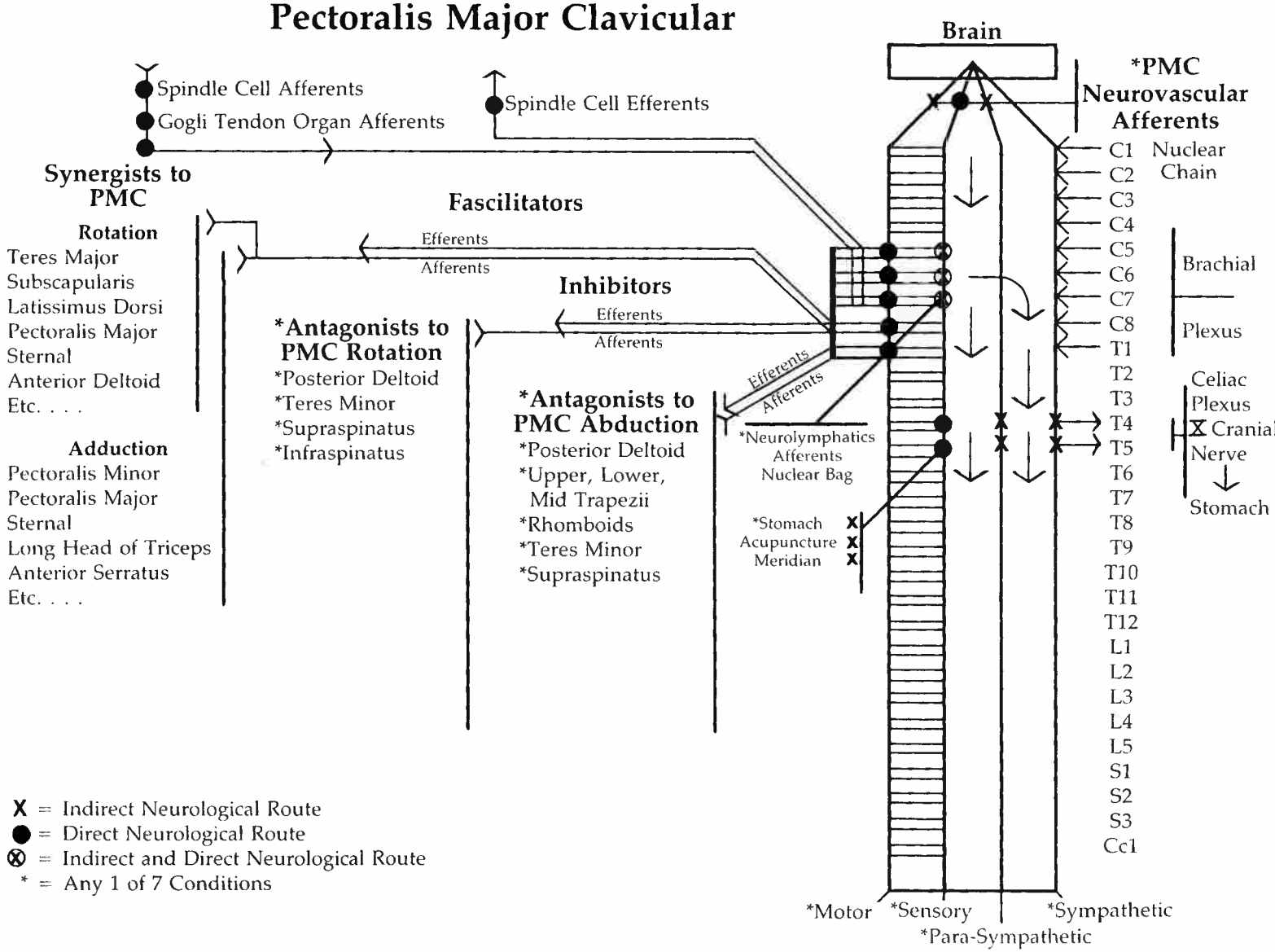
**Location:** Bi-lateral frontal bone eminences

Located bi-laterally at the frontal bone eminences of the cranium these Bennett reflex points (renamed by Goodheart as the Neuro-Vasculars), reflect the pathway from the nuclear chain via the Secondary (Flower Spray Endings) to the cerebrum of the brain (Schmidt et al.). The capillary flow of blood is regulated by these points to all of the muscles relating to the stomach and the stomach itself. The frontal eminences are major entry points into the nervous system. The neurovasculars give us a readout of the motor response from the spinal segment to the cerebrum. The neurovasculars also represent the parasympathetic action (inhibition) of the 10th cranial nerve to the stomach by decreasing motility, tone, and slowing secretions. This parasympathetic response is not a direct nerve connection from the neurovascular, but rather works on the principle of transmission, such as a garage door opener triggering the motor to react via a frequency prearranged for it to accept.

These neurovasculars are also noted to be "emotional stress release points." It is my feeling that the balance of these points inhibits all of the organs affected by the 10th cranial nerve through the parasympathetic nervous system.



# NEURO-ELECTRO FLOW CHART
## Pectoralis Major Clavicular



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