Conjugate Gaze Adjustive Technique:

An Introduction to Innovative Chiropractic Theory and Practice

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Introduction

I began investigating conjugate gazes and manipulative reflex techniques as a means to correct vertebral and visceral abnormalities following the publication of my book, *Language of the Archetype*.[1] My initial studies concerned the use of eye movements during communication, and how they influenced body movements, which then led me to explore patient-assisted movements as a means to activate specific cerebral pathways. I noticed that patients often moved their eyes in ways that seemed to balance a particular posture, and sometimes, their postures would shift after an eye gaze in some other direction. What finally caught my attention was that patients were often relieved of states of tension when certain eye movements were generated, and I wondered what mechanism was at work in this process.

Francine Shapiro, a psychologist, was the first to use eye movements in clinical practice in a meaningful way. She employs a system of psychotherapy known as Eye Movement Desensitization and Reprocessing.[2] Shapiro has patients perform specific eye movements to enhance memory recall, and aid the psychotherapeutic process. Her work served as an initial stimulus in trying to discover if there was a chiropractic connection.

Subsequently, I was led to J. Allan Hobson's work[3] in dream physiology where I learned many of the brain pathways of REM-sleep, but was still unable to see a link to the chiropractic correction of subluxations and end-organ involvement. Hobson's findings that the movements of dream characters are linked to the conjugate or staccato eye gazes

of REM sleep made me wonder if eye gazes and body movements in the awake state were also linked in some way we didn't understand. In trying to find a relationship between chiropractic and eye and body movements, I started researching the chiropractic literature. DeJarnette's work in S.O.T.[4] immediately caught my interest. His use of trapezius fiber contacts in C.M.R.T., occipital fiber analysis, and dollar sign corrections all seemed to connect to the central nervous system. This is what spurred my thinking in the use of conjugate gazes and patient-assisted movements for the correction of subluxations and their effects. Briefly stated, conjugate gazes are activated by the opposite cerebral hemisphere.[5] Eye movements, when they are voluntarily directed to the left, are activated by the right cerebral hemisphere through the medial longitudinal fasciculus;[6]the opposite is also true. This paradigm follows the central nervous system pathways for motor functions through the pyramidal decussation (Figure 1).

Figure 1
Eye movements directed toward the left are under the control of the right cerebral hemisphere. The opposite is also true.

It was this aspect of eye movements that became the link to the central nervous system. What I discovered was exciting. Eye movements, when they were specifically directed, seemed to increase metabolic activity on the side of conjugate gaze, and decrease metabolic activity on the opposite side. This

was especially true when *reflex contact* was held on a peripheral tissue. Spasms of the left trapezius, for instance, decreased in intensity when conjugate gazes were directed to the right, and gentle pressure was held on the belly of the muscle. Often, the spasms were recalcitrant and unresponsive to golgi tendon and muscle spindle techniques, until the eye gazes were employed.

I began testing muscles randomly. The deltoid was the most accessible muscle for the tests. In almost every instance, deltoid strength increased on the side of lateral gaze, and decreased on the opposite side. I subsequently began testing eye gazes on states of visceral dysfunction such as ileo-cecal valve spasm, and found the same to be true. Eye gazes that were directed away from the side of visceral hypertonicity tended to decrease spasm and increase peristalsis with just gentle surface contact applied to the valve. In one such case, the eye gazes alone were sufficient to elicit a peristaltic response. Based on these limited studies, I developed the premise that eye gazes directed away from the side of a peripheral lesion, tended to decrease corticospinal activity on the side of the lesion, and increase corticospinal activity on the side of lateral gaze.

I then discovered that using a gentle surface contact on the peripheral lesion seemed to heighten the central nervous system's response to the target tissue. It has already been documented that when a peripheral stimulus is applied to the body, it is recorded in the contralateral cerebral hemisphere. However, it is the ipsilateral cerebral hemisphere that gives attention to the stimulus.[7]Through association fibers that run through the anterior cingulate cortex, the connection between the two hemispheres is established. The contralateral cortico-

spinal tracts then respond to the site of the stimulus,[8] in this case the reflex contact, which serves as the point of reference (Figure 2).

Figure 2
The doctor holds an ileo-cecal contact on the patient's right. The stimulus is recorded in the patient's left cerebral hemisphere. Attention is drawn to the stimulus from the right cerebral hemisphere, which then activates motor units from the contralateral side to the ileo-cecal contact.

I believe this process is the one DeJarnette was activating when he performed the *dollar sign* correction. By stimulating the muscle belly of the spasmed muscle, while holding its synergist, the attention paid to the deeper of the two pressures may have activated the cerebral hemisphere on the side opposite the *dollar sign* (Figure 3). This causes an immediate modulation of the flaccid gluteus, and diminishes hypertonicity on the side of spasm. This thinking opened up a world of possibilities. I then wondered if other central nervous system processes could be employed in the correction of peripheral lesions. Take, for instance, the supine patient preparing for cervical adjustment. I discovered that hypertonic muscle fibers on one side of the neck were quickly responsive to a *vestibular reflex technique* I was investigating.

Figure 3
The patient has spasm of the right gluteus complex. The left glutei are hypotonic. The doctor holds symmetrical reflex contacts with deeper pressure on the side of spasm. Reflex modulation by the cerebral hemispheres corrects the imbalance.

Holding the cervical spine in a few degrees of rotation away from the side of spasm, and gently extending the head, activates the vestibular complex[9] on the side of extension. The patient is asked to gently raise his head from the doctor's hand, and when he does, the anti-gravity component of the *vestibulospinal reflex* is activated.[10] This almost immediately tones the flaccid muscle group, and reduces spasm on the side of subluxation. Holding gentle pressure into the flaccid muscle belly serves as a reflex point that directs the activity (Figure 4).

I have found that normal ranges of motion return to the subluxated vertebra when such releases occur, thus eliminating the need for high risk, high velocity adjustments. *Conjugate Gaze Adjustive Technique* (CGAT) is the term I use to define this developing approach. This technique can be used as an adjunct to any existing chiropractic technique, or, as I will describe, as a total approach to the patient. In the following chapters, I will describe the techniques and analysis, and the neural pathways involved when a specific technique is

employed. The techniques will be divided into spinal, visceral and neuro-emotional categories and the book will define CGAT as a system of care.

Figure 4
The Vestibulospinal Reflex Technique. The supine patient has cervical spasm on the right. The doctor rotates the patient's head away from the side of spasm, in this case to the left, and gently extends the head. The patient gently lifts her head activating the anti-gravity component of the vestibulospinal reflex.

Terms and Definitions

The following terms and definitions refer to the techniques and their effects on the target organ.

Modulation refers to the process of aiding the central nervous system in responding to a specific organ or muscle. Conjugate gazes are directed toward the side of contact, but only surface pressure is applied to the reflex point. Surface pressure is applied by gently resting the hand or fingers on the contact. Modulation also refers to the use of symmetrical reflex contacts to opposite sides of the body where one of the two contacts is deeper than the other. Eye gazes and patient-assisted movements are allowed to occur naturally in response to the peripheral reflex contact.

Upregulation refers to muscle spindle contact that is sufficient to elicit spindle excitation. Conjugate gazes are directed toward the side of contact.

Down regulation refers to a golgi tendon organ stretch that is sufficient to elicit 1b fiber excitation. Conjugate gazes are directed away from the side of organ contact.

Conjugate Gaze Test precedes application of the techniques and is used to establish a baseline or reference point to test the patient's basic response to conjugate gazes. The doctor chooses a neutral muscle such as the deltoid and tests it. If muscle strength is normal, the doctor has the patient perform 5 lateral eye gazes toward the muscle and hold the last gaze. He has the patient resist. The muscle should stay strong or become stronger. The doctor then has the patient perform 5 lateral gazes but this time to the opposite side. The muscle should weaken. This establishes the patient's basic

response to conjugate gazes, and is used as a reference point from visit to visit, or as the doctor deems appropriate.

Chapter 1:
The Cervical Subluxation

Conjugate Gaze Applications and the Vestibulospinal Reflex Technique

Cervical subluxations for the purpose of this text will be defined as a segmental motion abnormality that prevents the normal range of motion of a particular cervical vertebra. Individual practitioners can use any of the accepted modalities for subluxation identification. I personally use DeJarnette's cervical stair step technique,[11] which creates a smooth transition from analysis to correction when CGAT is used.

A vertebral subluxation, by definition, usually presents with restricted ranges of motion in one or more of the six planes of movement. The subluxated vertebra is usually associated with muscle guarding on the side of restriction, pain on the side of spasm, and hypotonicity on the side opposite fixation.

Using conjugate gazes to help correct cervical subluxations can be approached in one of two ways. First, the practitioner can choose to *upregulate* the *hypotonic* muscles on the side opposite fixation. Second, the spasms can be *downregulated* on the side of fixation. Let's look at the first case scenario.

Case Example

A patient presents with torticollis of the right trapezius and sternocleidomastoid muscles. Her head is laterally flexed to the right and rotated to the left (Figure 5). After a complete history and examination, the doctor concludes that the patient has an overuse syndrome of the involved muscles without apparent pathology. X-rays and other diagnostic modalities are used based on clinical necessity.

Figure 5
Torticollis of the right trapezius and SCM.

The Five-Step Protocol

The first step is to identify the dominant cerebral hemisphere. The *right* trapezius and sternocleidomstoid muscles are innervated by the cranial accessory nerve and under the control of the *contralateral* or *left* cerebral hemisphere.[12] The accessory spinal nucleus extends into the cord at the levels of C1-C5.[13]

In the second step, the doctor chooses to either work on the side of involvement or the opposite side, based on the severity of the complex and the degree of pain at the involved site. Working on the side of involvement requires down regulation of the spasmed trapezius and SCM; working on the opposite side requires up regulation of the flaccid muscle groups.

In this case we will discuss working on the side opposite involvement using *Conjugate Gaze and Upregulation.*

Step Three is application of the technique. The patient is supine. The doctor sits at the head of the table cradling the occiput. The doctor positions the fingers of his left hand into the fibers of the cervical extensors between C1 and C5, and applies sufficient pressure to activate the muscle spindles. If possible, the head should be slightly rotated away from the side of spasm and slightly extended. This will activate anti-gravity contractions in the extensor muscles of the cervical spine via Deiter's nucleus[14] (Figure 6). While holding this contact, the doctor has the patient perform 5 lateral eye gazes to the left and hold the last gaze for 5 seconds.

Figure 6
Supine patient has head rotated away from the side of spasm and slightly extended. The doctor holds muscle fiber contact between C1 and C5 on the left and has the patient perform 5 lateral eye gazes toward the side of contact. (Upregulation)

Step Four is technique modulation. The doctor feels for changes in tonicity, and based on the patient's initial response, can change the degree of head extension or rotation. Generally, the flaccid extensors and trapezius will tonify on the side of contact, and the muscles on the side of spasm will diminish. If necessary, the procedure can be repeated, and the speed or intensity of the eye gazes can be increased or decreased based on the patient's response. Motion palpation of the involved subluxation should return to normal.

Step Five employs the use of ancillary non-force techniques such as golgi tendon stretch or muscle spindle decompression as the doctor deems appropriate. Physiotherapeutic intervention can also be used at this time, or in preparation for the treatment, based on the doctor's protocol. I do not recommend performing eye gazes in more than one direction in any given treatment. Eye gazes are complex mechanisms that activate multiple nervous system pathways and should not be performed indiscrimanently.[15] Up to three sets of gazes should be sufficient to activate any given pathway.

Now, let's take the same case, but this time the doctor chooses to work on the side of involvement.

The technique is *Conjugate Gaze and Down Regulation.*

The first step is the same in every case. The doctor identifies the dominant cerebral hemisphere, which in this case is the left and unchanged. The patient is again supine and the doctor is seated at the head of the table.

The doctor's right hand contacts the right trapezius at its tendinous origin on the occiput, and performs a gentle stretch-distraction of the golgi tendons. The doctor holds the contact and has the patient perform 5 lateral eye gazes to the

left, and holds the last gaze for 5 seconds (Figure 7). The doctor monitors the trapezius for changes in tonicity, and can repeat the procedure as described. Ancillary techniques can be used as appropriate. During the performance of this technique, the doctor can simultaneously hold deeper contact to the muscle spindles on the left between C1 and C5. This will upregulate the flaccid trapezius on the left while downregulating the hypertonic fibers on the right.

Figure 7
Conjugate Gaze and Downregulation. The doctor's right hand contacts the golgi tendons of the right trapezius on the occiput. A gentle stretch-distraction is employed. During the stretch-distraction the patient performs 5 lateral eye gazes to the left.

The Vestibulospinal Reflex Technique

Figure 8
When the head is turned to the left, the eyes involuntarily turn to the right. The opposite is also true.

The *vestibulospinal reflex technique* has its origins in the tracts of the vestibular apparatus of the 8th cranial nerve at the junction of the pons and medulla.[16] It is well documented that when the head is turned to either side, the eyes involuntarily move to the opposite side as a result of neural impulses originating in the vestibular apparatus on the side the head is turned[17] (Figure 8).

These neural impulses differ from the conjugate gaze mechanism. In conjugate gaze, the ipsilateral abducens nucleus activates a retrograde conduction through the medial longitudinal fasciculus to activate the contralateral oculomotor nucleus. Thus, the ipsilateral lateral rectus and contralateral medial rectus conjugately move the eyes.[18, 19] This combination of neural inputs occurs as a coordinated effort within the *center for conjugate gaze* in the paramedian pontine reticular formation.[20]

In pure lateral gaze, the contralateral cerebral hemisphere exercises control over the oculomotor and abducens nuclei to insure that the movements are coordinated. In the applica-

tion of the *vestibulospinal reflex technique*, we by-pass the neural inputs associated with the *conjugate gaze center*, and directly activate the vestibular apparatus on the side of contact. Basically, as it regards our topic, the vestibular nerve functions to stabilize conjugate gaze fixation during movements of the head.[21] The semicircular canals of the inner ear transmit our spatial orientation to the cerebellum, brain stem and spinal cord. [22] These impulses help to activate our muscles in order to maintain our balance and equilibrium as we navigate through space.[23] The *vestibulospinal reflex technique* utilizes this process in conjunction with the anti-gravity mechanism of the vestibular apparatus. The saccule and utricle of the semicircular canals are responsible for modulating the movement and position of the head in relation to gravity.[24] Calcium carbonate crystals known as otoliths, which pick up changes in position and linearity, trigger the sensory receptors of the macula within the saccule and utricle.[25]

In the development of the *vestibulospinal reflex technique,* it is this function of the vestibular apparatus that can directly activate flaccid muscle groups usually found on the side opposite fixation. By gently rotating and extending the head away from the side of fixation and spasm, the ipsilateral vestibular apparatus activates the anti-gravity muscles on the side of rotation. Through neurons located in the lateral vestibular nucleus or Deiter's nucleus, axons project into the lateral vestibulospinal tract on the ipsilateral side, which activates the anti-gravity extensor muscles on the side of rotation and extension.[26] This lateral spinal pathway functions *unilaterally* and this specificity enhances its use when unilateral correction is desired. The vestibular complex also sends ax-

ons to the medial longitudinal fasciculus bilaterally through the medial vestibulospinal nucleus. These axons function to innervate spinal cord neurons in the cervical cord bilaterally,[27] and can be used in the correction of unilateral fixations that are accompanied by weak cervical muscles bilaterally. The technique is the same, but the doctor implements bilateral head rotations and extension, holding the contact point, while the supine patient performs gentle isokinetic movements of the head toward the ceiling (Figure 9a and 9b). In this way, the doctor focuses on the taut and tender fibers causing restriction on the side of fixation, but then performs the technique bilaterally using patient-assisted movements for spinal strengthening.

Figure 9a and 9b.
If unilateral cervical fixations are accompanied by weak paraspinal muscles, the doctor can implement head rotations and extension.

Technique Application

Let us again take the example of the patient with cervical spasm and fixation. This time, the patient presents with C2 subluxation on the right, and deep cervical spasm in the

sub-occipital triangle and splenius cervices on the right. In this case, we do not have to concern ourselves with the dominant cerebral hemisphere, because we will be using the lateral vestibulospinal tract, which functions unilaterally.

The patient is supine and the doctor is seated at the head of the table. The doctor cradles the patient's occiput and exerts pressure into the left cervical extensors at the level of C2. The pressure should be sufficient to stimulate muscle spindle excitation on the hypotonic side. When the doctor feels contraction of the hypotonic fibers, he then rotates the patient's head away from the side of spasm, in this case the left, and extends the head. Pressure is gently held into the hypotonic muscles (See figure 4). With the head in this position, the doctor asks the patient to gently raise his head like he was going to lift it off his finger contact. This movement is meant to serve as an activator of the vestibulospinal reflex more than an actual movement of the head and should barely be perceptible. As soon as the head is moved, the antigravity mechanism will activate the ipsilateral cervical extensors and erectors. The patient then relaxes the head in the doctor's hands. The doctor may then choose to repeat the technique, but this time he can work on the side of fixation and spasm before working on the hypotonic side.

With the patient's head turned away from the side of spasm and gently extended, the doctor can milk the golgi tendon organs on the side of spasm, and then the original adjustment can be performed on the side of hypotonicity. At the completion of the adjustment, physiotherapy can be used, as the doctor deems appropriate.

Patterning Cervical Corrections

It is the obvious objective of any treatment protocol to achieve a long-lasting effect of any therapeutic modality. Inherent in any treatment is the idea that the practitioner can offer guidelines that will enhance the overall correction. In *Conjugate Gaze Adjustive Technique* the practitioner uses patient-directed exercises to reinforce the correction made in the office. The exercises are based on the actual premises of the technique, and are prescribed on a case-by-case analysis of each patient, their respective syndromes and contraindications, and the therapeutic goals of the doctor. Each patient is given a specific *exercise technique* that amplifies the actual corrective procedure done in the office. The main objectives of the exercises are to insure corrective reinforcement of the doctor's adjustment, and to recruit the patient for the active phase of the correction. This not only insures proper neural facilitation of the involved pathways, but also teaches the patient to focus on states of abnormal muscle tension inherent in biomechanical abnormalities.

There are 4 categories of *neuromuscular retraining* used in this process. They are (1) *myofascial stretch along the sagittal or mid-sagittal-coronal plane* (2) *myofascial stretch with conjugate gaze away from the side of hypertonicity* (3) *isometric contraction with conjugate gaze toward the side of weakness* and (4) *isotonic contraction using extremity-assisted movements*. Let's take each of the four categories individually. Each of the exercise categories uses the basic premise of *Conjugate Gaze Adjustive Technique* and puts it into a therapeutic frame for patient rehabilitation. In much the same way that the doctor makes a correction by directing

the appropriate cerebral hemisphere to amplify or divert a given neural pathway, the patient is also given a similar procedure based on the presenting dynamics. In each case, the doctor scrutinizes the patient's condition, and although all of the exercises are safe and easy to follow, prescribes only those that are deemed appropriate for each patient. The doctor must always take into account the patient's past medical history, presenting complaints, contraindications and segmental pathology that may preclude the use of *any* exercise intervention.

In category 1, we are using myofascial stretch along the sagittal plane of the body. In the cervical spine, the deep muscles of the neck are vertically arranged in the sagittal plane. The semispinalis, longissimus, and iliocostales muscles all follow this paradigm.[28] The transversospinal group, which are under the deep muscles, are tangentially oriented between a mid-sagittal and coronal plane, and are aligned along the same axis as the muscles of the sub-occipital triangle.[29] In simple myofascial stretch, the doctor attempts to realign the fibers of the deep neck muscles by teaching the patient to slowly stretch them in both the sagittal and mid-sagittal-coronal planes. The patient starts the exercise by simply lowering the chin to the chest as far as she can. If only one side of the neck is involved, or more tonic than the other, the patient will immediately feel resistance on the side of greater involvement. By simply holding the position where resistance is met, the patient activates 1b afferents from the golgi tendon organs and simultaneously activates lateral spinothalamic tracts. These mechanisms not only serve to locally stretch the muscle, but they bring attention to