TECHNIQUE

Descriptive Review of Knee Chest Specific Chiropractic: Standards of Care, Teaching, Research, and Clinical Practice Related to Craniocervical Subluxation Analysis and Correction

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ABSTRACT

Background: The Knee Chest Specific Chiropractic (KCSC) technique represents a significant evolution in the analysis and correction of craniocervical subluxations, focusing particularly on the Atlas and Axis vertebrae. Rooted in the pioneering work of BJ Palmer, this technique has undergone extensive development since the early 20th century.

Technique Methods: KCSC utilizes a combination of spinal thermography and advanced radiographic analysis to identify and correct subluxations with precision. KCSC's methodology includes unique procedures for patient positioning, thermal scanning, and specific adjustic thrusts designed to ensure both the effectiveness and safety of chiropractic adjustments. The technique emphasizes a high-velocity, high-amplitude adjustic thrust with specific torque and recoil to correct misalignments without causing additional vertebral stress.

Research Agenda: Through extensive clinical and case studies, KCSC has demonstrated its effectiveness in alleviating a variety of conditions linked to upper cervical subluxations, such as vertigo, tinnitus, and systemic health issues. The research underscores the necessity of precise subluxation listings and the importance of practitioner training in maintaining high standards of care.

Conclusion: The KCSC technique offers a refined, evidence-based approach to chiropractic care, emphasizing the critical role of accurate subluxation correction in promoting overall health and neurological function. This paper aims to describe KCSC through a comprehensive review of the technique.

Key Words: *Knee Chest Specific Chiropractic, craniocervical subluxation, Atlas subluxation, Axis subluxation, spinal thermography, x-ray analysis, adjustic thrust, neurological interference, chiropractic adjustment, vertebral misalignment, BJ Palmer, neurocalometer, chiropractic research, upper cervical spine, paraspinal temperature differential*

Historical Considerations on the Technique

The Palmer School of Chiropractic (PSC) has been credited with developing many adjusting techniques. According to BJ Palmer, by 1930 the school had 205 different adjustic moves.[1-2]

These varied from manual adjustments to those performed with an instrument.

The manual adjustic thrusts were developed in three phases:[2]

1. Private Practice of Chiropractic, Charlotte, NC
2. Private Practice of Chiropractic, Acworth, GA
3. Private Practice of Chiropractic, Encinitas, CA
4. Private Practice of Chiropractic, England

The first was called “pushes and pulls”. This method relied upon the weight of the chiropractor acting as the momentous force to move the vertebra using a manual push or pull. Palmer described this approach as low velocity, high amplitude.

The second was the “toggle” thrust. Developing upon the “pushes and pulls” method, the toggle used a bimanual thrust to adjust subluxations. It was described as a high velocity, high amplitude thrust.

The third was the “toggle-recoil with torque”. Like the toggle thrust previously mentioned, the toggle-recoil with torque was adapted specifically for Atlas and Axis subluxations. In Chiropractic Green Book Volume XVIII: The Subluxation Specific The Adjustment Specific, BJ Palmer stated that it was the unique anatomy of the upper cervical spine which allows subluxations here to misalign to a greater degree than below the level of Axis.

Torque, which is the twisting motion of the chiropractor’s shoulders and arms, allows for the correction of these specific subluxations of Atlas or Axis. Recoil is the relaxation of the chiropractor’s arms at the end of the adjustic thrust. The purpose of recoil is to prevent the adjustic thrust from driving the subluxated vertebra from one side of the neural canal to the other side, therefore, causing nerve pressure and interference on the contralateral side of the spinal cord.

This adjustic thrust, or move 206, the toggle-recoil with torque, using a knee chest adjusting table, would become the pioneer of upper cervical chiropractic techniques (1). BJ Palmer called this technique “HIO” or “Hole-In-One”. Borrowing the term from golf, HIO technique focused on adjusting efficiency. Just like golf, where a hole-in-one is the ultimate objective, BJ Palmer taught that using HIO technique, a chiropractor had the potential of adjusting a subluxation once for long-term correction.

From 1930 to 1934, the PSC began its initial research into HIO technique (1). First, it eliminated the use of all subjective analyses for subluxation, such as palpation and Meric system. X-ray was used to analyze the misalignment, occlusion and permanency components of subluxation, while the neurocalometer (NCM) was used to analyze the pressure, interference and permanency components.

Patients were scanned with the NCM during each visit. Adjustments were performed only when a significant temperature differential was observed in the upper cervical spine. The adjustic thrust was only performed on either Atlas or Axis, in accordance with the laterality of specific subluxation analyzed per x-ray.

The results of this were published in Palmer’s Volume XVIII: The Subluxation Specific The Adjustment Specific.[1] In summary, Palmer concluded that:

1. Vertebral subluxations could only exist in the upper cervical spine. This was because the upper cervical area lacked interlocking facet joints, therefore, allowing for a much greater degree of misalignment, sufficient to cause spinal cord pressure and interference to nerve flow.
2. Atlas and Axis subluxations cause spinal cord pressure. This is what explained temperature differentials observed below the level of Axis and their subsequent correction following the adjustment of an upper cervical subluxation.
3. Move 206, or HIO technique, was the most efficient at reducing and correcting the objective indicators of vertebral subluxation, per spinal thermography and x-ray.

The second phase of research into HIO technique began in 1935 with the inauguration of the BJ Palmer Research Clinic at the PSC.[2]

This facility was divided into two segments: medical and chiropractic. The purpose was to obtain a complete objective workup for each patient using the highest standards of each profession.

First, a patient received medical diagnostics to confirm their medical diagnosis. This was performed by medical doctors on staff.

Second, the patient would receive a chiropractic analysis to confirm the causative subluxation of the patient’s condition. This was performed by chiropractors on staff. The analysis included a NCM full spine scan and full spine x-rays.

The daily chiropractic procedure for established patients included the following:[2]

1. NCM scan of cervical spine to confirm the presence or absence of subluxation.
2. Adjustments were performed only when a significant temperature differential of constant character or pattern was observed in the upper cervical spine.
3. Adjustments focused exclusively to either Atlas or Axis.
4. Immediately after the patient was adjusted, a post-NCM scan was performed to confirm reduction of subluxation pressure and interference.
5. Then the patient was required to rest upon a bed in the supine position for about 3 hours. According to BJ Palmer, this allowed the necessary time for a subluxated vertebra to become “seated” in a more permanent alignment.
6. Following this rest period, the patient was permitted to leave with instructions to be “neck conscious”, avoiding strain to the neck.

In 1951, Palmer published Chiropractic Green Book Volume XXV: Chiropractic Clinical Controlled Research to highlight some of the results attained and the various conditions that patients recovered from. Such conditions included liver cancer, sciatica, pediatric epilepsy, multiple sclerosis,

lethargic encephalitis, hydrocephalus and uterine tumors, to name a few.

Following the death of BJ Palmer in 1961, HIO technique was continued through the efforts of Lyle Sherman, DC. Sherman, former assistant director of the BJ Palmer Research Clinic. Sherman published cases from the BJ Palmer Research Clinic highlighting various health conditions and patient's response to HIO technique.[4]

In the 1980's, Michael Kale, DC, formed Kale Seminars, teaching HIO technique. Students and chiropractors were taught pattern analysis, x-ray analysis and knee chest adjusting. Kale published a paper demonstrating the reason for changing the chiropractor's segmental contact point from the transverse process of Atlas to the posterior arch.[5] Dr. Kale would continue to teach the Kale Technique until his death in 2001.

Robert Kessinger, DC, who was an instructor for the Kale Seminars, began teaching his approach to HIO technique, called Knee Chest Upper Cervical Specific (KCUCS), in 2001.

Kessinger incorporated the following changes to HIO technique:[6]

1. Prone functional leg check: in conjunction with spinal thermography pattern analysis to confirm the presence or absence of subluxation.
2. Blair protracto x-rays: analyze for Atlas laterality.

Description and Objectives of the Technique and Analysis

KCSC technique focuses on the analysis and correction of Atlas and Axis subluxations. According to BJ Palmer, DC, a vertebral subluxation at the level of Atlas and Axis contains five components that can be objectively measured:[1]

1. Misalignment: displacement of one vertebra, in all three planes of motion, where its articular surface has lost proper juxtaposition in relation to the segment above and/or below.
2. Occlusion: narrowing of the neural canal and/or intervertebral foramina.
3. Pressure: pressure upon spinal cord.
4. Interference: decreased quantity nerve flow between brain cell and tissue cell.
5. Permanency: Atlas and Axis subluxations stay locked, out of normal juxtaposition, causing a constant-variable pressure and interference to nerve flow. This constant-variable pressure meant that the subluxation was constant but the severity varied throughout the day, typically more severe in the afternoon than the morning hours.[2]

Misalignment, occlusion, and permanency are objectively analyzed via x-ray. KCSC technique takes the following four views of the cervical spine to demonstrate these subluxation components:

1. Neutral lateral.
2. Neutral APOM.
3. Cervical rotation, left.
4. Cervical rotation, right.

The neutral lateral view is taken with the patient seated and central ray directed at the mastoid fossa. KCSC does not recommend leveling the patient's hard palate, therefore, manipulating the positional misalignment of the subluxation. This view is used to visualize misalignments of Atlas or Axis in the sagittal plane. Atlas can misalign either anterior and superior or posterior and inferior upon the occipital condyles, in a curvilinear motion like a rocking chair. Axis can misalign posterior and inferior upon the superior facets of C3.

The neutral APOM view is taken with the patient seated and mouth open. The horizonal central ray passes through the mastoid fossae, while the vertical central ray passes through the center of the mouth. KCSC does not recommend leveling patient lateral head tilt, therefore, manipulating the positional misalignment of the subluxation. This view is used to visualize misalignments of Atlas and Axis in the frontal plane. Atlas can misalign left or right in relation to the occipital condyles, while Axis can misalign left or right in relation to C3.

KCSC cervical rotation views are taken with the patient standing and cervical spine maximally rotated left and then right. The patient's upper chest and head will meet the bucky. The central ray is directed to the mastoid fossa. These views are used to visualize the locking effect that subluxation has upon normal joint biomechanics, which aids the chiropractor in determining the subluxation listing. KCSC cervical rotation views can also be used as the determining factor when both Atlas and Axis appear to be misaligned on the lateral and APOM cervical views. The vertebra which demonstrates the least amount of biomechanical movement will be the one that is subluxated.

KCSC Subluxation Listings:

KCSC utilizes x-ray to image the structural components of a vertebral subluxation: misalignment, occlusion, and permanency. This analysis is used to create a subluxation listing of either Atlas or Axis. The chiropractor uses this to determine the correct direction to perform the adjustic thrust.
Atlas subluxation listings include ASL, ASR, PIL and PIR. In ASL, Atlas has misaligned anterior-superior and lateralized left, in relation to the left occipital condyle. In ASR, Atlas has misaligned anterior-superior and lateralized right, in relation to the right occipital condyle.

For all AS Atlas subluxation listings, the chiropractor will stand on the side of the patient that is ipsilateral to the subluxation listing. In PIL, Atlas has misaligned posterior-inferior and lateralized left, in relation to the left occipital condyle. In PIR, Atlas has misaligned posterior-inferior and lateralized right, in relation to the right occipital condyle. For all PI Atlas subluxation listings, the chiropractor will stand on the side of the patient that is contralateral to the subluxation listing.

Atlas subluxation listings will also include the suffix of "-C"

or "-T", indicating where the chiropractor's episternal notch is placed. This guides the specific angle or line of drive used in the adjustic thrust. "-C" is in reference to the lower cervical spine, while "-T" is in reference to the upper thoracic spine.

This specific listing suffix is determined using the APOM x-ray (Figure 2). First, determine the Atlas subluxation listing. Then, measure the angle formed between the occipital condyle and Atlas lateral mass on the opposite side. For Atlas subluxation listing ASR, measure the left joint between the occipital condyle and Atlas lateral mass. If the angle is less than 45 degrees, the chiropractor will place their episternal notch over the lower cervical spine, listed with the suffix "-C". If the angle is more than 45 degrees, the chiropractor will place their episternal notch over the upper thoracic spine, listed with the suffix "-T". An Atlas listing of ASR that measures a contralateral angle less than 45 degrees, the correct written listing would be "ASR-C".

Axis subluxation listings include PLI and PRI. According to BJ Palmer, DC, Axis cannot misalign anterior-superior. The fovea dentalis of Atlas functions as a bony lock, preventing anterior-superior misalignments of Axis.[1] In PLI, Axis right inferior facet has misaligned posterior-inferior and to the left (medial) in relation to C3 superior facet. In PRI, Axis left inferior facet has misaligned posterior-inferior and to the right (medial) in relation to C3 superior facet.

Axis subluxation listings will also include the suffix of "-C" or "-T", indicating where the chiropractor's episternal notch is placed, as well as which side of the patient the chiropractor stands on. The specific listing suffix for Axis is determined using the lateral x-ray. Measure the angle formed between Axis inferior facet and C3 superior facet, in relation to a horizontal plane that is perpendicular to the posterior body of Axis (Figure 1).

If the angle is less than 45 degrees, the chiropractor will place their episternal notch over the lower cervical spine, listed with the suffix "-C", as well as stand on the side of the patient that is ipsilateral to the subluxation listing. If the angle is more than 45 degrees, the chiropractor will place their episternal notch over the upper thoracic spine, listed with the suffix "-T", as well as stand on the side of the patient that is contralateral to the subluxation listing. So, for an Axis listing of PLI that measures a C2/C3 facet joint angle of less than 45 degrees, the correct written listing would be "PLI-C".

KCSC X-ray Analysis:

1. Lateral cervical view, Atlas (Figure 1): The reference point for Atlas is the anterior tubercle. If the anterior tubercle is more superior than the posterior tubercle, then Atlas has misaligned anterior-superior and listed as "AS" in the Atlas subluxation listing. If the anterior tubercle is more inferior than the posterior tubercle, then Atlas has misaligned posterior-inferior and is listed as "PI" in the Atlas subluxation listing. Normal is when the anterior and posterior tubercles are mostly level (Figure 1).

2. Lateral cervical view, Axis (Figure 1): The reference point for Axis is the odontoid process. If the odontoid process is 50% or more posterior in relation to the basion, then Axis has misaligned posterior-inferior and is listed as "PI" in the Axis subluxation listing. This causes the odontoid process to tilt back into the neural canal. Normal is for odontoid process to sit upright without posterior projection into the neural canal.

3. APOM view, Atlas (Figure 2): KCSC measures the "sideslip" or lateralization, as well as the "wedging" or convergence of Atlas in relation to occipital condyles.

   Sideslip: First, place reference points on the inferior, medial tips of the occipital condyles, where they articulate with the lateral masses of Atlas. Then draw a vertical axis through each of these two points. This creates the "Neural Canal Lines", which represents the lateral borders of the neural canal at the foramen magnum. Second, draw a vertical axis along the medial borders of Atlas lateral mass, bilaterally. This creates the "Atlas Canal Lines", which represents the lateral borders of the neural canal between the lateral masses of Atlas. When completed, there will be a total of four vertical axes drawn: two from the occipital condyles and two from Atlas lateral masses. If Atlas misaligns to the left, then the Atlas Canal Lines will appear to shift left in relation to the left Neural Canal Line coming down from the left occipital condyle. This is listed as "L" for left in the Atlas subluxation listing. If Atlas misaligns to the right, then the Atlas Canal Lines will appear to shift right in relation to the right Neural Canal Line coming down from the right occipital condyle. This is listed as "R" for right in the Atlas subluxation listing. Normal will reveal Neural Canal Line and Atlas Canal Line as equidistant.

   Wedge: First, place reference points on the inferior, medial tips of the occipital condyles, where they articulate with the lateral masses of Atlas. Then draw a line connecting one point to the other. This creates the "Condylar Plane Line", which represents occipital alignment in relation to Atlas. Normal will show Condylar Plane Line level with Atlas Plane Line and the horizon.

   Second, place reference points on the inferior, lateral tips of Atlas lateral mass, bilaterally. Then draw a line connecting one point to the other. This creates the "Atlas Plane Line", which represents Atlas alignment in relation to occipital condyles. If Atlas misaligns left, a convergence on the left will be evident between Condylar Plane Line and Atlas Plane Line.

This is listed as “L” for left in the Atlas subluxation listing. If Atlas misaligns right, a convergence on the right will be evident between Condylar Plane Line and Atlas Plane Line. This is listed as “R” for right in the Atlas subluxation listing. Normal will show Atlas Plane Line and Condylar Plane Line level with each other and the horizon.

4. APOM view, Axis (Figure 3): First, place reference points on the lateral tips of Axis superior articular surfaces and join them with a line. This creates the “Axis Plane Line”, demonstrating how Axis articulates with C3. Second, draw a plane line across the inferior portion of C3 body. This creates the “C3 Plane Line”. Normal will show Axis Plane Line level with C3 Plane Line. For Axis subluxation listing PLI, Axis body will be high on the left and low on the right. This is caused by Axis right inferior facet misaligning posterior-inferior (PI) and to the left (medial). For Axis subluxation listing PRI, Axis body will be high on the right and low on the left. This is caused by Axis left inferior facet misaligning posterior-inferior (PI) and to the right (medial).

5. Cervical Rotation views, Atlas (Figure 4): First, locate and mark the anterior tip of the occipital condyle. The occipital condyle can be found by locating the posterior-inferior aspect of the clivus. The occipital condyle will extend directly inferior to the clivus. Second, mark the anterior-superior tip of Atlas lateral mass.

   Upon left cervical rotation, normal biomechanics shows Atlas left lateral mass shifting posterior-inferior upon the left occipital condyle. This will cause the anterior-superior tip of Atlas left lateral mass to move away (posterior-inferior) from the left occipital condyle. Upon right cervical rotation, normal biomechanics shows Atlas right lateral mass shifting posterior-inferior upon the right occipital condyle. This will cause the anterior-superior tip of Atlas right lateral mass to move away (posterior-inferior) from the right occipital condyle.

   If Atlas is misaligned to the left, the two reference points, between the left occipital condyle and left Atlas lateral mass, will not appear to shift or show minimal shift in the PI direction when compared to the right joint. This is listed as “L” for left in the Atlas subluxation listing.

   If Atlas is misaligned to the right, the two reference points, between the right occipital condyle and right Atlas lateral mass, will not appear to shift or show minimal shift in the PI direction when compared to the left joint. This is listed as “R” in the Atlas subluxation listing.

6. Cervical Rotation view, Axis (Figure 5): The reference points of analysis are Axis spinous process and C3 spinous process. Upon left cervical rotation, Axis spinous process will rotate to the right, beyond C3 spinous process. Upon right cervical rotation, Axis spinous process will rotate to the left, beyond C3 spinous process. For Axis subluxation listing PLI, Axis spinous process will not rotate to the right beyond C3 spinous process upon left cervical rotation. For Axis subluxation listing PRI, Axis spinous process will not rotate to the left beyond C3 spinous process upon right cervical rotation.

KCSC Pattern Analysis (adults):

Spinal thermography is used to analyze the neurological components of a vertebral subluxation: pressure, interference, and permanency. Using a thermal scanner, the chiropractor measures and interprets paraspinal skin temperature differentials. Atlas or Axis subluxations cause a paraspinal temperature differential pattern to develop that is constant in character and varies only in intensity.[2] This heat pattern is specific to the vertebral subluxation that is causing it, so that, when present, the same directional misalignment analyzed per x-ray has returned.

KCSC scanning protocol aims at eliminating the variables of skin temperature analysis, thereby, obtaining a constant scan specific and sensitive to vertebral subluxation. The three variable factors include 1- external temperature, 2- patient stress, 3- stimulants and inhibitors.

First, external temperature will affect patient skin temperature. Accurate scans require patient skin temperature to be acclimated to office room temperature. Patients need to simply be in the office for 15 minutes prior to receiving a scan.

Second, patient stress can also affect skin temperature. Various stress factors can either cause the skin to become cold and clammy or warm and sweaty. To eliminate this variable, patients need to rest in the supine position for 15 minutes prior to receiving a scan.

Third, stimulants and inhibitors will also affect skin temperature. Such stimulants include nicotine and caffeine, while common inhibitors include analgesics, muscle relaxants and alcohol. Since the effects of these chemicals can last for hours or days, patients are advised not to consume any during the day of a thermal scan.

Once these variables have been eliminated, the patient is ready to receive a thermal scan. To begin, have the patient seated in an upright position. Remove anything covering the posterior aspect of the cervical spine, such as turtleneck clothing, jewelry, or long hair. Instruct the patient to lower their chin without leaning their head forward. This is done to elevate the occiput and better expose the upper cervical spine.

The chiropractor will hold the thermal scanner using their dominant hand and place the sensor probes on either side of C7 spinous process. It is important to press the sensors into the skin and avoid any airgap, which would act as another variable

in attaining an accurate reading. While pressing into the skin, do so lightly, to not cause any friction heat that could interfere with the scan. The opposite hand is used to create the scanning terminal point- the end point of the scan. This is accomplished by the chiropractor using their thumb and index finger to palpate for the inferior aspect of the occiput, along its lateral edge where it meets with the posterior aspect of the mastoid process.

For example, for right-handed chiropractors, the scanner will be held in the right hand. The chiropractor's left hand is used to create the scanning terminal point, so that, the left thumb is on the posterior aspect of the left mastoid process and left index finger is on the posterior aspect of the right mastoid process.

This serves as the first thermal scan. A significant temperature differential is that of 0.5 degrees Celsius or greater. This temperature differential is indicative of a vertebral subluxation of either Atlas or Axis. To confirm the first thermal scan, a second one needs to be taken at least 24 hours later, in accordance with established pattern analysis protocol.[2] If the second thermal scan is "in pattern" with the first one, then a subluxation is present.

Once the patient's thermal pattern has been established, this baseline will be used for subsequent office visits in determining if the subluxation has returned or not.

KCSC Pattern Analysis (pediatrics):

The following scanning procedure and analysis is for the pediatric patient typically until the age of three to four years old. To begin, the chiropractor will use the single probe scanning function of the thermal unit to perform a "fossa scan" rather than a gliding scan. The scanning points will be along the paraspinal area, just lateral to the intervertebral foramina, between occiput and Atlas, bilaterally. This point is anterior to the paraspinal muscles and posterior to the SCM muscle.

First, begin by taking a scan of the right paraspinal area and then the left. A temperature differential of 0.5 degrees C or greater, in pattern, indicates the presence of an Atlas subluxation. To determine the thermal pattern for pediatrics, two scans are required at least 24 hours apart. For example, a pediatric thermal pattern scan will reveal a temperature differential constant on one side. The cold side will be associated with the Atlas subluxation listing.

Thermal Categories:

KCSC recognizes five different categories of thermal results, as originally developed by Palmer:[2] 1) clear, 2) improved, 3) rough, 4) adaptive and 5) pattern. It is important to note that these categories are all relative to a patient's established thermal pattern.

Clear scans will have a temperature differential ranging between 0 to 0.24 degrees Celsius (Figure 6). These are considered normal and the ultimate objective following a KCSC adjustment. Pre-adjustment clear scans indicate that the subluxation is not present, and an adjustment is not clinically necessary. Post-adjustment clear scans indicate that the subluxation was corrected.

Improved scans have a temperature differential between 0.25 to 0.49 degrees Celsius (Figure 7). These scans indicate a significant reduction of subluxation. Pre-adjustment improved scans show that the subluxation is not present, and an adjustment is not clinically necessary. Post-adjustment improved scans demonstrate that the subluxation was significantly reduced.

Rough scans have a temperature differential of 0.5 degrees Celsius or more but are not in pattern (Figure 8). These scans indicate that the thermal variables have not been eliminated: 1) temperature acclimatization, 2) patient stress factors and 3- stimulants/inhibitors consumption. Rough scans do not indicate the presence of subluxation and should not be adjusted.

Adaptive scans have a temperature differential of 0.25 degrees Celsius or more (Figure 9). These scans are characterized by their appearance to be a mirror image of the patient's established thermal pattern. It has been noticed through clinical experience that what makes these scan types unique is that, when present, they indicate that a subluxation is likely returning soon. Pre-adjustment adaptive scans show that the subluxation is not present, and an adjustment is not clinically necessary. Post-adjustment adaptive scans reveal that the subluxation was reduced.

Pattern scans have a temperature differential of 0.5 degrees Celsius or more and are indicative of neuropathophysiology[6] (Figure 10). These types are confirmed using two scans separated by at least 24 hours apart. Pre-adjustment pattern scan indicates the presence of a subluxation and the clinical necessity for a KCSC adjustment. Post-adjustment pattern scan indicates one of two possibilities: 1- chiropractor did not perform the adjustic thrust successfully or 2- chiropractor is adjusting an incorrect subluxation listing due to x-ray analysis error. If the post-adjustment pattern scan is present but, in less intensity, then it is considered a mild reduction of the subluxation.

KCSC Adjusting Procedure:

KCSC technique uses a knee chest upper cervical table for Atlas and Axis subluxations. Adjustments are performed with the patient in the Palmer posture: kneeling on a cushioned pad, with chest and shoulders resting upon the table, and cervical spine rotated to the side of subluxation listing. The purpose of this patient posture is two-fold:

First, the Palmer posture allows for complete relaxation of patient's paraspinal muscles. With less resistance, the chiropractor can facilitate the adjustment with greater efficiency and less discomfort to the patient. Second, cervical rotation to the side of Atlas or Axis laterality will reduce the misalignment by moving it through its range of motion along the subluxated joint.

For example, in an Atlas ASL subluxation, Atlas has misaligned anterior-superior and lateralized to the left in relation to the left occipital condyle. When placed upon the

knee chest table, with left cervical rotation, Atlas left lateral mass will shift posterior-inferior (PI) down the left occipital condyle and lateralize to the right.

For Axis subluxation, PLI, Axis right inferior facet has misaligned posterior-inferior and to the left (medial) in relation to C3 right superior facet. When placed upon the knee chest table, with left cervical rotation, Axis right inferior facet shifts anterior-superior (AS) upon C3 superior facet and lateralizes right.

Since the joint is locked in subluxation, it will not be able to move through its full range of motion, however, head rotation towards side of laterality reduces each of the three planes of misalignment. This also facilitates the adjustment by "pre-setting" the vertebra away from its subluxated position and towards normal juxtaposition.

KCSC adjusting procedure can be divided into six steps:

1. Doctor and Patient Position (Figure 11): Patient begins by kneeling upon a cushioned pad on the floor before placing their chest and shoulders upon the knee chest table. Patient will then turn their head in to the side of subluxation listing. To accomplish relaxation of the paraspinal muscles, the patient will position their legs so that the femurs are perpendicular to the ground.

   Once the patient is properly positioned, the doctor will stand beside the patient, in accordance with the specific subluxation listing. For ASL listings, the chiropractor will stand on the patient's left side. For ASR listings, the chiropractor will stand on the patient's right side. This stance properly positions the chiropractor to correct the "AS" portions of the subluxation listing. For all "AS" Atlas listings, the chiropractor is positioned in a fencer stance, with the superior leg correlating with the side of Atlas laterality.

   So, for Atlas listing ASL, the chiropractor's left leg is placed in the superior position, while the right leg is placed in the inferior position. The knee of the superior foot is positioned near the patient's axilla, while the inferior foot is placed near the patient's knee. For PIL listings, the chiropractor will stand on the right side of the patient. For PIR listings, the chiropractor will stand on the left side of the patient. This stance properly positions the chiropractor to correct the "PI" portions of the subluxation listing. For all "PI" Atlas listings, the chiropractor is positioned in a fencer stance, with the inferior leg correlating with the side of Atlas laterality. For PIL listings, the chiropractor's left leg will be in the inferior position, while the right leg will be in the superior position.

2. Palpate contact point (Figure 12): Chiropractor palpates Atlas transverse process or Axis spinous process using index finger contralateral to subluxation listing. For ASL listings, the chiropractor will use the right index finger and vice versa.

3. Tissue pull (Figure 13): This step will shift the soft tissues away from the contact point so that the chiropractor can make a firmer contact once the hand is applied. For Atlas adjusting, the chiropractor will place their middle finger halfway between Axis spinous process and Atlas transverse process. Then the chiropractor will gently press into the soft tissue until all the slack has been removed. Once accomplished, the chiropractor will continue to press into the soft tissue, moving in a line towards Atlas transverse process, until the middle finger meets the index finger. If done correctly, the soft tissue will be drawn taut, avoiding any slack. As Axis spinous process protrudes through soft tissues to a much greater extent than Atlas transverse processes do, there is not issue pull necessary when adjusting Axis subluxations.

4. Nail hand contact (Figure 14): The nail hand is the hand that comes in contact with the patient's spine. For all left laterality listings of Atlas and Axis, the chiropractor will use the left hand as the nail hand and vise-versa, with the pisiform being the specific point of contact. The nail hand is positioned in the classic high arch, as developed by Palmer.[1] Correct placement of the nail hand is performed by securing the pisiform of the nail hand onto the nail bed of the opposite hand's middle finger. Then slide the nail hand pisiform down until it meets the patient's contact point, being either Atlas transverse process or Axis spinous process.

   Following, the chiropractor will pre-torque the elbow of the nail hand while also gently pressing into the contact point, so as to further remove any soft tissue slack. For all left laterality listings, the chiropractor will pre-torque the left elbow in a clockwise motion, starting from the 8 o'clock position and ending at the 10 o'clock position.

   For all right laterality listings, the chiropractor will pre-torque the right elbow in a counterclockwise motion, starting from 4 o'clock and ending in the 2 o'clock position. Pre-torquing serves as a type of "wind-up" for the chiropractor, much like the wind-up does for a baseball pitcher. This will increase the chiropractor's ability to deliver a high velocity adjustic thrust.

5. Hammer hand contact (Figure 15): The hammer hand is the hand that is placed on top of the chiropractor's nail hand in the classic high arch position. It will always be the hand contralateral to the subluxation listing. The pisiform of the hammer hand is secured in the webbing of the thumb of the nail hand, with thumb and fingers wrapped around the nail hand wrist. Once completed, the chiropractor will then use the hammer hand to traction-down the cervical spine.

   This is accomplished by the chiropractor using the hammer hand as a leverage to apply a posterior-to-anterior pressure to the patient's lower cervical and upper thoracic spine. The purpose of this is to remove cervical

spine joint slack. This will focalize the adjustic thrust into the specific contact point, rather than allowing it to disperse to segments above and below.

6. Adjustic thrust (Figure 16): The KCSC adjustic thrust is a high velocity, high amplitude toggle-recoil with torque procedure used for Atlas and Axis adjusting. This specific adjustment can be best described using the formula for force, where mass is represented by the chiropractor's "body drop" and acceleration is represented by the chiropractor's "toggle-recoil with torque". Body drop is defined as the shifting of upper body weight from being supported upon the inferior foot to the superior foot. The body drop motion is like a fencer's lunge. Its purpose is to create a momentum of motion which is then transferred into the arms for the adjustic thrust. At the end of the body drop, the chiropractor will perform a toggle thrust by completely extending both elbows. At the end of the thrust, the chiropractor will apply torque. Torque is a spinning motion accomplished through the rotation of the shoulders and elbows.

   For all "AS" Atlas listings and all Axis listings, the chiropractor will use a "superior" torque, where the nail hand elbow is quickly internally rotated, while the hammer hand elbow is quickly externally rotated. For all "PI" Atlas listings, the chiropractor will use an "inferior" torque, where the nail hand elbow is quickly externally rotated, while the hammer hand elbow is quickly internally rotated. The purpose of torque for Atlas subluxations is to unlock the "AS" and "PI" portions of the subluxation listing, so that Atlas can rotate in a curvilinear manner along the occipital condyles. The purpose of torque for Axis subluxations is to unlock the tilt and rotation of Axis upon C3. Once the adjustic thrust is completed, the chiropractor needs to allow complete relaxation of their arms. If done correctly, the arms will naturally recoil away from the patient's spine. It is important to note that the chiropractor does not manually pull the arms away, forcing a recoil. Rather, the recoil should be the natural result of a high velocity, high amplitude adjustic thrust with complete relaxation at the end. The purpose of the recoil is to prevent thrusting the subluxated vertebra from one side of the neural canal to the other, as this can create a new subluxation.

Post-adjustment rest:

Following a KCSC adjustment, patients are required to rest in the supine position for a minimum of 15 minutes. The purpose of the post-adjustment rest is to allow time for the vertebra to become seated or anchored in its natural alignment and reduce the risk of the subluxation returning soon.[2]

Post-adjustment thermal scan:

After the patient has completed their rest, a post-adjustment scan is performed to confirm if the adjustic thrust was successful in reducing or correcting the subluxation. Adaptive and improved post-adjustment scans indicate a reduction of subluxation. Pattern scans with decreased temperature differential also indicate a reduction of subluxation. A clear scan indicates correction of the subluxation and is the ultimate objective. A pattern scan without improvements in temperature differentials indicates that the adjustic thrust was not successful. A pattern scan with increased temperature differentials indicates that an incorrect subluxation listing was adjusted.

Categorization of Knee Chest Specific Chiropractic Technique

KCSC technique focuses on the specific analysis and correction of the five components of subluxation. Since this involves both neurological and structural components, KCSC technique can be considered a hybrid between the tonal and segmental models.

KCSC is first, a tonal technique. Using paraspinal thermography, the chiropractor screens for nerve pressure and interference to nerve flow. This is the metric used to indicate the neurological components of vertebral subluxation and the neurological effects of the adjustment. KCSC technique begins with the nervous system first.

KCSC is secondarily a segmental technique. Using x-ray, the chiropractor screens for vertebral misalignment and occlusion. This is the metric used to indicate the structural components of vertebral subluxation. If misalignment and occlusion are evident on x-ray and are sufficient to cause nerve pressure and interference to nerve flow, as indicated by spinal thermography, then a KCSC adjustment is performed to unlock the subluxation from its abnormal position and guide the vertebra towards normal juxtaposition. KCSC technique adjusts vertebral subluxations of the upper cervical spine to restore normal neurophysiology.

KCSC Technique Subluxation Hypothesis

Knee Chest Specific Chiropractic Technique is based upon the "cord pressure" model developed by BJ Palmer.[2] This model is exclusive to the craniocervical area and postulates that a subluxation of Atlas or Axis can cause pressure within the neural canal, directly impacting the spinal cord.

Palmer stated that cord pressure was possible between occiput, Atlas, and Axis due to the unique anatomy of this area. Unlike the lower spinal column, there are no interlocking facet joints between these articulations. It is this that allows for a greater degree of movement sufficient to cause a vertebral subluxation with cord pressure in all three planes of motion.

Palmer used paraspinal thermography and x-ray to substantiate his cord pressure theory. First, full spine scans were performed to establish specific segmental heat differentials. Second, full spine x-rays were taken to analyze for an Atlas or Axis subluxation, as well as to note any compensatory misalignments and curvatures in the lower spinal column. Adjustments were performed only when indicated necessary per paraspinal thermography and were exclusive to either Atlas or Axis, as indicated per x-ray. The results revealed that correcting an Atlas or Axis subluxation would balance paraspinal heat differentials and reverse lower spinal compensatory misalignments and curvatures. This supported

Palmer's theory that cord pressure could affect the entire spine.

Methods

KCSC technique is specific to Atlas and Axis subluxations. Once the patient has been properly screened for a subluxation, the chiropractor will perform the adjustment upon a knee chest upper cervical table. The patient will place their knees upon a kneeling pad, then secure their chest and shoulders upon the knee chest table. Their head is rotated towards the side of subluxation listing (e.g. Atlas ASL subluxation listing indicates left cervical rotation) and opposite side face will be placed upon the table. The patient's hands are in a relaxed position on the table's hand rests. To facilitate patient comfort and relaxation, it is important to have their thighs perpendicular to the floor. If the knees are brought closer or further away from the perpendicular position, it can cause tightness of the lumbar paraspinal muscles, further affecting cervical paraspinal muscle tightness and preventing the adjustic thrust from achieving vertebral cleavage.

Once the patient has been properly positioned, the chiropractor will stand on the side of the patient that is specific to the subluxation listing. Using an Atlas subluxation listing of ASL, the chiropractor will stand on the left side of the patient, with their left leg (superior) placed against the patient's left rib cage and their right leg (inferior) placed against the patient's left hip. This will position the chiropractor in a fencer stance. It is important for the chiropractor to position their episternal notch specific to the patient's specific subluxation, as this will significantly increase the chance of vertebral cleavage when performing the adjustic thrust.

For ASL subluxations with a contralateral occipital condyle/Atlas lateral mass joint angle of greater than 45 degrees, the chiropractor will place their episternal notch above the upper thoracic spine (T1-T3 area). For ASL subluxation with a contralateral occipital condyle/Atlas lateral mass joint angle of less than 45 degrees, the chiropractor will place their episternal notch above the lower cervical spine (C5-C7 area).

Now the chiropractor will palpate the vertebral contact point. For Atlas subluxations, the contact point will be the transverse process. For Axis subluxations, the contact point will be the spinous process. For Atlas ASL subluxations, the chiropractor will use the right-hand index finger to palpate for the contact point. When the cervical spine is rotated, Atlas transverse process and Axis spinous process will be found at points slightly different when compared to the neutral position. Atlas transverse process can be palpated inferior and posterior to its respective mastoid process. Axis spinous process can be palpated superior and lateral to C3 spinous process.

After the vertebral contact point has been palpated then the chiropractor will apply a tissue pull. Using the middle finger in a sweeping motion, beginning at a point corresponding halfway between Axis spinous process and mastoid fossa, and terminating on the index finger.

Once the tissue pull is complete, the nail hand is arched in the classic high arch position, with the wrist and thumb maximally extended, while the other four fingers are flexed forward. The chiropractor will now apply the nail hand pisiform upon the nail bed of the opposite hand middle finger and apply a slight lateral to medial pressure to firm-up the contact. Now the chiropractor will apply a pre-torque with the nail hand arm. Using the elbow, for left lateralization subluxation listings, the chiropractor will pre-torque clockwise; for right lateralization subluxation listings, the chiropractor will pre-torque counterclockwise. The purpose of pre-torque is to create momentum or a wind-up effect in the chiropractor's arm, like when a baseball pitcher winds-up for their throw.

Then the chiropractor will place their hammer hand upon their nail hand. The hammer hand will be positioned so that the pisiform is secured within the nail hand thumb webbing, while the thumb and fingers are wrapped around the lower wrist of the nail hand.

Next, the chiropractor will slowly extend both elbows, while applying pressure with the hammer hand. This will secure the cervical spine and upper thoracic spine to the knee chest table, so that when the adjustic thrust is performed, it can be focalized to either Atlas or Axis contact points.

The KCSC adjustment can be best described using the physics formula of force, where force equals the product of mass and acceleration. Mass is generated with the body drop, which serves to initiate momentum. Acceleration is generated with the toggle, which transfers the body drop momentum with high velocity through the chiropractor's arms and hands.

The adjustment begins with the "body drop" initiated by the chiropractor. This is where the chiropractor's body weight is suddenly transferred forward, like a fencer's thrust. It is important for the chiropractor's elbows not to buckle during the body drop or much of the generated momentum will be lost. At the end of the body drop the chiropractor will apply the adjustic thrust. This is a toggle recoil with torque procedure, where the toggle is applied first and then torque once the elbows have reached maximal extension. Then the chiropractor will relax their arms, causing a natural recoil, where the hands are no longer applying pressure upon the patient's spine.

Rules for torque:

Atlas ASL: Chiropractor's left hand is nail hand and right hand is hammer hand. Nail hand and hammer hand both torque counterclockwise.

Atlas ASR. Chiropractor's right hand is nail hand and left hand is hammer hand. Nail hand and hammer hand both torque clockwise.

Atlas PIL: Chiropractor's left hand is nail hand and right hand is hammer hand. Nail hand and hammer hand both torque clockwise.

Atlas PIR: Chiropractor's right hand is nail hand and left hand is hammer hand. Nail hand and hammer hand both torque counterclockwise.

Axis PLI: Chiropractor's left hand is nail hand and right hand is hammer hand. Nail hand and hammer hand both torque counterclockwise.

Axis PRI: Chiropractor's right hand is nail hand and left hand is hammer hand. Nail hand and hammer hand both torque clockwise.

Chiropractic Analysis

KCSC technique utilizes spinal thermography and x-ray to analyze vertebral subluxation.

First, the patient's subluxation pattern must be established using two scans separated by at least 24 hours. A subluxation pattern is a thermal scan that has demonstrated a constant character with a temperature differential of at least 0.5 degrees C. Thermal pattern scans will either deviate to the right or left before returning towards center. It is these deviations in the heat line which form the character of the thermal scan and are described as being "in pattern" when subsequent scans reveal them present. When the thermal pattern is present, a subluxation of either Atlas or Axis is the cause.

Once the thermal pattern has been established, cervical x-rays will be required to determine which vertebra is subluxated and its specific subluxation listing.

Begin by taking the neutral lateral cervical x-ray. Analyze Atlas first by determining if it has subluxated either anterior-superior (AS) or posterior-inferior (PI). In an AS, Atlas anterior tubercle is more superior than posterior tubercle. In a PI, Atlas posterior tubercle is more superior than anterior tubercle. Normal is for Atlas anterior and posterior tubercle to be mostly level. Now analyze Axis by determining if it has subluxated posterior-inferior (PI). In a PI, Axis odontoid process will tilt back into the neural canal more than 50% beyond the basion. A vertical line drawn from the basion will demonstrate any posterior misalignment of the odontoid process.

Next, analyze the neutral APOM. Analyze Atlas first. Begin by placing dots on the inferior, medial tips of the occipital condyles. From these tips, draw a vertical line downward. These are called the "Neural Canal Lines" and represent the lateral borders of the neural canal at the level of the foramen magnum. To compare it in relation to Atlas, draw a vertical line on the medial border of Atlas lateral mass, bilaterally. These lines are called the "Atlas Canal Lines" and indicate the lateral borders of the neural canal at the level of Atlas. Normal will show Neural Canal Lines and Atlas Canal Lines equidistant. A subluxation of Atlas to the left will demonstrate an approximation of Atlas Canal Lines to the left Neural Canal Line. A subluxation of Atlas to the right will demonstrate an approximation of Atlas Canal Lines to the right Neural Canal Line.

Now analyze Axis. Place dots on the lateral tips of Axis superior articular surface and connect them with a line. This is called the "Axis Plane Line" and represents how Axis sits upon C3. Next draw a line across the inferior aspect of C3 body. This is the C3 Plane Line. Normal is for Axis Plane Line and C3 Plane Line to sit level with each other and the horizon. Axis subluxations will cause the Axis Plane Line to become unlevel, with the high side correlating with the side of subluxation listing. For Axis PLI subluxation, Axis Plane Line will be high on the left. For Axis PRI subluxation, Axis Plane Line will be high on the right.

After completing the APOM, now the chiropractor can analyze the KCSC Rotation view. Beginning with Atlas, the reference points will be the occipital condyle and lateral mass. Start by placing a dot on the anterior tip of the occipital condyle and then another dot on the superior-anterior tip of Atlas lateral mass. Normal is for Atlas lateral mass to demonstrate posterior-inferior (PI) movement down its respective occipital condyle upon cervical rotation to same side. This will cause the marked points to separate. The side of Atlas subluxation listing will correlate with the side that Atlas lateral mass does not move or moves less than the opposite side. For example, Atlas subluxations that have lateralized to the left will demonstrate minimal or no movement of left lateral mass down the left condyle. Visually this will look as if both points of analysis have not separated or have separated less than the opposite side.

Next, analyze Axis using KCSC Rotation view. With left cervical rotation, Axis spinous process normally rotates towards the right, beyond midline and C3 spinous process. With right rotation, Axis spinous process normally rotates towards the left, beyond midline and C3 spinous process. For Axis PLI subluxation, the spinous process of C2 will be found in line with C3 spinous process or minimally rotated beyond when compared to opposite side rotation. For Axis PRI subluxation, the spinous process of C2 will be found in line with C3 spinous process or minimally rotated when compared to the opposite side rotation.

Once the basic subluxation listing of either Atlas or Axis has been properly analyzed, then the chiropractor will need to determine episternal notch placement as well as doctor position. Episternal notch placement will guide the line-of-drive or vector for the adjustic thrust that is specific to the patient's unique subluxation.

For Atlas adjusting, measure the angle formed between the occipital condyle and lateral mass contralateral to subluxation listing. If the angle is more than 45 degrees, then the episternal notch is placed above the patient's upper thoracic spine, between T1-T3 area. If the angle is less than 45 degrees, then the episternal notch is placed above the patient's lower cervical spine, between C5-C7 area. For all AS Atlas listings, the chiropractor will stand on the side of patient ipsilateral to the subluxation listing. For all PI Atlas listings, the chiropractor will stand on the side of the patient contralateral to the subluxation listing.

For Axis adjusting, measure the angle formed between the facet joint of Axis and C3. If the angle is more than 45 degrees, stand on the posterior of the patient (contralateral to subluxation listing) and place episternal notch above upper thoracic spine, between T1-T3 area. If the angle is less than 45 degrees, stand on the anterior of the patient (ipsilateral to subluxation listing) and place episternal notice above lower cervical spine, between C5-C7 area.

The following are all the possible KCSC specific subluxation listings:

Atlas	Axis
ASL-C	PLI-C
ASL- T	PLI-T
ASR- C	PRI-C
ASR-T	PRI-T
PIL-C	
PIL-T	
PIR-C	
PIR-T	

KCSC technique monitors Atlas and Axis subluxations for reduction and resolution using spinal thermography and x-ray. Using both tests, chiropractors can properly analyze the neurological and structural components of a vertebral subluxation with confidence.

Thermal scans are performed each visit to determine if the subluxation has returned. Subluxations are considered reduced when paraspinal temperature deviations are less than that of the established thermal pattern. Resolution of subluxation is indicated by temperature differentials that range between 0- and 0.24-degrees C.

X-rays are performed periodically to evaluate the structural state of vertebral subluxation and its effect on the spinal column. The structural components of Atlas and Axis subluxations are considered reduced when the lines of analysis are less than the established baseline values. For example, the angle of the wedge formed between Condylar Plane Line and Atlas Plane Line can be measured. If the pre-angle measured at 10 degrees convergence and the post-angle measured at 5 degrees convergence, then the subluxation would be considered reduced. Structural correction of Atlas and Axis subluxation is indicated by the normal balance between the lines of measurement.

Adjustment Modes

KCSC technique utilizes a toggle recoil with torque to correct vertebral subluxation of Atlas and Axis. It is described as a high velocity, high amplitude thrust with torque and recoil.

Frequency and Duration of Care

The BJ Palmer Research Clinic demonstrated that patients do not need to be seen on a high frequency, high duration schedule of care. When the technique procedure has been properly applied, Palmer's research revealed that subluxations could maintain in alignment for weeks or months and in one case, about one year. Palmer would check patients between 3-5 visits per week, with the average adjustment holding for about 28 days.[2]

The average stay for a patient at the BJ Palmer Research Clinic was about six weeks. This was the time that it took the subluxation of most patients to stabilize. Then Palmer would refer the patient back to their local chiropractor for ongoing care, typically recommending about three months of getting checked and adjusted when necessary.

Palmer attributed the capability for subluxations to remain in alignment to the following:

1. Technique applied: Palmer taught that the adjustment had to be applied at the right time, in the right direction, in the right way. This meant that a chiropractor should only adjust when a subluxation is present, regardless of symptoms, using x-ray to determine the specific direction of thrust and applied with HIO technique.
2. Post-adjustment rest: Palmer would rest patients for about 3 hours following an adjustment. He found that patients would maintain their adjustments for longer periods of time. This post-adjustment rest procedure was based in part due to medical research published by George Crile, MD in his "A bipolar theory of living processes". In this work, Crile wrote about the effects of rest and sleep on the cellular level and how that recharges the cell so that it may function optimally.

With this knowledge, KCSC technique has developed a care plan model that is adaptable to all patient demographics:

Phase I Care: Patients are checked two visits per week for four weeks. Objectively, thermal scans should be balancing more with subsequent visits, indicating that the subluxation is reducing. Symptomatically, the patient should notice gradual improvements in their condition. Following this initial six weeks, follow-up KCSC x-ray series will be taken to confirm structural improvements in alignment.

Phase II Care: Patients are checked one visit per week for the second four-week cycle. Objectively, thermal scans should be more balanced than in Phase I, indicating further stabilization of the subluxation. Symptomatically, this is the phase when most patients notice significant improvements in their condition. Typically, a follow-up x-ray is not required in

Phase II Care for most patients. If the patient's x-rays confirm any instability of vertebral alignment, such as, instability of the anterior and posterior longitudinal ligaments or a spondylolisthesis, it would be advised to take a follow-up x-ray to verify if the condition is stabilizing with care or getting worse.

Phase III Care: Patients are continued on one visit per week for the third four-week cycle. Objectively, most thermal scans should range between clear (0-0.24 degrees C) and improved (0.25-0.49 degrees C). Symptomatically most patients have experienced significant improvements to complete resolution of their condition. The final set of KCSC x-rays will be taken to confirm structural correction.

Trauma

KCSC technique may be applied to certain trauma cases of the cervical spine once the chiropractor has properly screened for

any potential red flags using x-ray, physical examination and/or referral for further imaging, such as MRI or CT. Common trauma cases in chiropractic offices include whiplash injuries and concussions. Red flags should be referred for the appropriate MRI or CT scan to rule out any damage to the brain and spinal cord. Once the injury is deemed stable, the chiropractor may use KCSC technique analysis and adjusting.

Prevention and Public Health Issues

KCSC technique views vertebral subluxation as a silent epidemic. Like cardiac disease, subluxation may go without any obvious symptoms being manifested and often, screening alone will make a patient aware of its presence. This is why asymptomatic pediatric patients need to be screened for vertebral subluxation. Furthermore, patients may have a specific condition that is not responding to conventional treatments. This is why symptomatic geriatrics who have chronic conditions need to be screened for vertebral subluxation.

KCSC promotes chiropractic public education so that patients can be more informed of health care options available to them outside of the traditional allopathic approach. Public lay lectures are encouraged to educate people- public schools, places of business, retirement communities, etc.

Collaborative Care

KCSC chiropractors are trained in collaborative care and making appropriate referrals when necessary. Since KCSC chiropractors see a wide range of patient conditions, it is important to know a few specialists to better serve the patient. KCSC technique recommends the following medical doctors for referral: cardiac specialist, internist, pulmonologist, orthopedic surgeon, and neurosurgeon. Common conditions that KCSC chiropractors may see, associated with the medical specialists previously mentioned, include hypertension, type 2 diabetes, asthma, degenerative disc disease and scoliosis.

Contraindications and Complications

While KCSC technique is safe and effective for the correction of Atlas and Axis subluxations, a proper examination and screening is required to rule out any contraindications to care.

The following is a list of KCSC contraindications to care:

1. Surgery: Fusion of either occiput, Atlas or Axis.
2. Fractures: Occiput, Atlas, Axis and C3.
3. Vertebral dislocations: Atlas, Axis and C3.

KCSC technique may also have its inherent complications, for better and for worse. When properly applied, KCSC technique may cause paraspinal muscle soreness for a few days following initial adjustment. This is thought to occur due to head-righting reflex, which is responsible for causing lower spinal compensations when an Atlas or Axis subluxation is present. Subsequently, the KCSC adjustment corrects the subluxation, now resetting the head-righting reflex, which in turn, reduces lower spinal compensations. These sore spots are considered a "constructive complication" and reported as tolerable from all patients.

In contrast, when applied incorrectly, KCSC technique may create negative complications. Such complications include worsening of the patient's condition or causing a new condition to develop. If the chiropractor does not properly analyze the x-rays for the correct subluxation listing, then the adjustic thrust will be performed in the wrong direction. This will often make the existing subluxation worse, which increases nerve pressure and further decreases nerve flow. By comparison, if the chiropractor makes an adjustment when there is no subluxation present, then it becomes evident that a subluxation can be caused, which will cause pressure upon different nerves and lead to new conditions developing.

To eliminate the variable of these complications, KCSC chiropractors are trained in the proper usage and interpretation of spinal thermography and x-ray. Using these two tests, the chiropractor can make an objective determination whether an Atlas or Axis subluxation is present or not.

Legal Issues

It is important for the KCSC chiropractor to practice within the laws of chiropractic for their specific State or country. In addition, KCSC chiropractors should also use an informed consent, provided from their respective malpractice insurance, with all patients. This is important as it creates clinical transparency for patients and legally protects the chiropractor if they practice within its guidelines. It is important that the informed consent is also specific to KCSC technique, so that spinal thermography and x-ray are included in the list of tests and diagnostics covered by the chiropractic malpractice insurance.

KCSC chiropractors are also trained in proper patient documentation for each visit. Using the SOAP notes format, chiropractors can accurately document the patient visit. First, the chiropractor secures the subjective from the patient. Next, the patient's current thermal scan and most recent x-rays will be included in the objective. Following, if a KCSC adjustment was clinically necessary, the chiropractor will include the segment and specific subluxation listing in the assessment. Last, the chiropractor will complete the plan of care, detailing the frequency and duration of care.

Research

Research in knee chest adjusting began in 1930 by BJ Palmer at the Palmer School of Chiropractic. Initial findings were published in chiropractic Green Book Volume XVIII: The Subluxation Specific, The Adjustment Specific.[1] Further research was performed at the BJ Palmer Research Clinic, beginning in 1935, with findings published in 1951 chiropractic Green Book Volume XXV: Chiropractic Clinical Controlled Research.[2]

Palmer's research into knee chest adjusting served two purposes: one, he wanted to determine which adjusting techniques were the most efficient at clearing the neurocalometer indicator for subluxation; two, because of better technique efficiency, chiropractors were now capable of seeing success with patient conditions where with previous techniques they had seen failure. Palmer concluded in his research that knee chest and side posture solid headpiece

adjusting were the most efficient at accomplishing this objective.[2]

Lyle Sherman, DC published eight case studies from the BJ Palmer Research Clinic detailing spinal thermography pattern analysis, daily patient subjective notes and any medical tests performed.[3]

In the 1980's, Michael Kale, DC began publishing papers on knee chest adjusting. His papers focused on detailing the specifics of knee chest adjusting. Kale established the "6 steps", describing proper doctor/patient position and locating the spinal contact points. Unlike BJ Palmer, Kale taught that adjusting Atlas subluxations using the posterior arch was most efficient. His 1997 paper used a mathematical model demonstrating, in theory, that the posterior arch was more suitable than the transverse process for Atlas subluxation adjusting.[5]

In 2000, knee chest adjusting research was continued by Robert Kessinger, DC.[10] His paper focused on implementing Blair upper cervical x-ray analysis to determine the specific subluxation listing, as well as guiding the chiropractor on proper doctor positioning in relation to the patient to complement each specific listing.

In addition, Kessinger has also published various case studies documenting specific conditions responding to knee chest adjusting:[8] Vertigo, tinnitus, and hearing loss in a geriatric patient. Kessinger et al. also published a paper on knee chest upper cervical and pulse pressure findings.[9] This study demonstrated the positive effects of knee chest upper cervical in relation to balancing heart rate variability.

Erin Elster, DC published papers demonstrating the results of knee chest upper cervical with Parkinson's disease[11] and vertigo.[12] Elster established the correlation between previous head and neck injuries, and the onset of either Parkinson's disease or vertigo.

Furthermore, in 2004, Owens et al, found a very high reliability between inter and intraexaminer testing using paraspinal thermography.[4] ICC values were recorded between 0.91 to 0.98. This indicated that changes seen in thermal patterns were due to physiological changes of the nervous system rather than equipment error. Applying this to knee chest adjusting, any changes observed in thermal patterns post-adjustment are the direct result of the procedure.

KCSC Research Agenda:

Knee Chest Specific Chiropractic technique is dedicated to the advancement of chiropractic through the publication of scientific, peer-reviewed research. In addition to this paper detailing technique, KCSC plans to undertake research in the following areas:

1. Spinal thermography patterns and degenerative disc disease: Palmer wrote that subluxation causes nerve pressure and interference to nerve flow, which in turn causes heat to emit from the affected spinal nerves. If bony pressure upon spinal nerves can cause this, would this also hold true for spinal nerve pressure caused by a degenerative intervertebral disc? It has been observed in clinical practice that patients with degenerative disc disease often exhibit a paraspinal temperature differential at or near the involved level. The purpose of this future research is to first, establish the connection between degenerative disc/spinal nerve pressure and paraspinal temperature differentials, and second, to demonstrate KCSC adjustment efficiency at correcting this problem.

2. Cycles of correction: BJ Palmer first described this phenomenon in chiropractic Green Book Vol. XXV Chiropractic Clinical Controlled Research.[2] Following a patient's initial specific adjustment, it was common for the thermal pattern to return within the first two weeks of care, even if there was no reported injury.

   Palmer noticed that if no adjustment was given, even though the thermal pattern was present, in most cases the pattern would disappear within two weeks. Palmer concluded that "cycles of correction" was a normal process, where the supportive soft tissue reassumes normal tone, from the old, subluxated position, to the new, aligned position of the vertebra. KCSC will continue to develop research into cycles of correction by determining how the different post-adjustment thermal categories affect the duration of this process. It is theorized that the cycles of correction will last for longer periods of time as post-adjustment thermal scans go from clear, to improved and finally to adaptive.

Nomenclature

The following is a list of nomenclature specific to KCSC technique. There is some overlap from established nomenclature as originally developed by BJ Palmer.

KCSC: Knee Chest Specific Chiropractic
Atlas subluxation listings
ASL: Atlas has subluxated anterior-superior and lateralized left in relation to left occipital condyle.

ASR: Atlas has subluxated anterior-superior and lateralized right in relation to right occipital condyle.

PIL: Atlas has subluxated posterior-inferior and lateralized left in relation to left occipital condyle.

PIR: Atlas has subluxated posterior-inferior and lateralized right in relation to right occipital condyle.

*Atlas subluxation listings will also have a suffix to signify placement of doctor's episternal notch: -C for lower cervical spine and -T for upper thoracic spine.

Axis subluxation listings

PLI: Axis has subluxated posterior-inferior and lateralized left in relation to right C3 superior facet.

PRI: Axis has subluxated posterior-inferior and lateralized right in relation to left C3 superior facet.

*Axis subluxation listings will also have a suffix to signify the chiropractor's episternal notch placement, as well as which side of the patient to stand: -C for lower cervical placement of chiropractor's episternal notch and chiropractor stands on side of patient that is ipsilateral to subluxation listing; -T for upper thoracic placement of chiropractor's episternal notch and chiropractor stands on side of patient that is contralateral to subluxation listing.

Atlas anatomy
TP: transverse process
PA: posterior arch
Axis anatomy
SP: spinous process
Adjusting
Nail hand: chiropractor's hand that contacts patient spine

Hammer hand: chiropractor's hand that is secured on top of nail hand

Torque, superior: chiropractor's nail hand elbow torques towards chiropractor and hammer hand torques away.

Torque, inferior: chiropractor's nail hand elbow torques away from chiropractor and hammer hand torques towards.

Training, Education and Certification

KCSC technique offers training and certification to both chiropractic students and doctors. The training program includes six seminars over a two-year process where applicants may then register for KCSC technique certification.

KCSC training and education focuses on the following:

1. Anatomy and physiology of the craniocervical area
2. Spinal palpation of cervical spine
3. Spinal thermography pattern analysis
4. X-ray positioning and analysis for specific subluxation listings
5. KCSC adjusting drills
6. History of chiropractic adjusting techniques developed by BJ Palmer, from full spine to upper cervical specific
7. Chiropractic philosophy

KCSC technique governing body is composed of four chiropractors.

KCSC was founded by Arthur Plesa, DC (Life University, 2008) in 2021. He was responsible for the new developments in knee chest adjusting, as well as the KCSC X-ray series. Plesa developed the course materials for the training seminars and established the certification process. He teaches spinal thermography pattern analysis.

Matthew Wolfertz, DC (Life University, 2010) serves in the capacity of KCSC seminar instructor. He teaches KCSC adjusting technique and spinal palpation.

David Shores, DC (Los Angelos College of Chiropractic, 1994) serves in the capacity of KCSC seminar instructor. He teaches KCSC x-ray positioning and analysis.

Scott Jackson, DC (Anglo-European College of Chiropractic, 2015) serves in the capacity of KCSC seminar instructor. He teaches chiropractic philosophy and history.

Chiropractic Practitioners: Knee Chest Upper Cervical

According to the international directory of upper cervical chiropractors website www.uppercervicalcare.com, there are currently 140 knee chest upper cervical practitioners.
KCSC technique has been training students and doctors of chiropractic since 2021. The official website www.kneechestspecificchiropractic.com has nine chiropractors listed as certified in KCSC technique.

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Appendix

Figure 1. Atlas and Axis Analysis

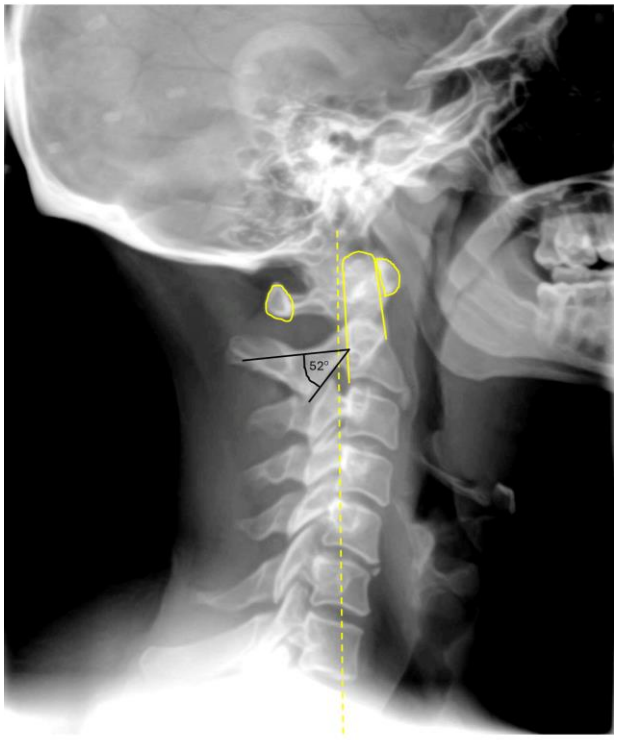


Figure 2. Atlas Analysis
ASR-C

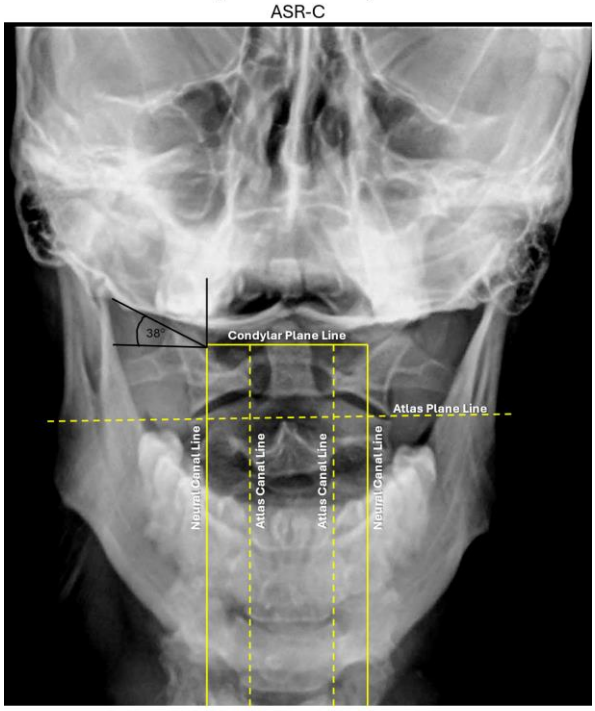


Figure 3. Axis Analysis

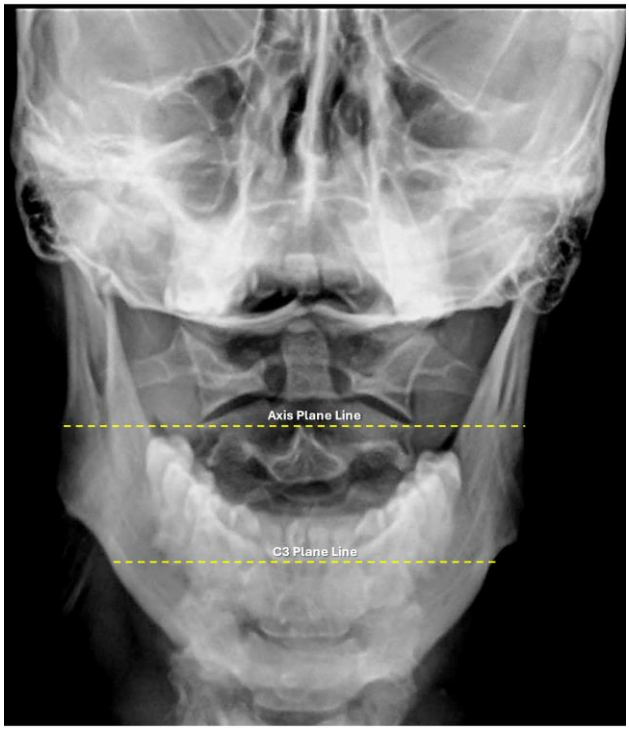


Figure 4. KCSC Rotation View, Left
Atlas Analysis

Figure 4. KCSC Rotation View, Right
Atlas Analysis

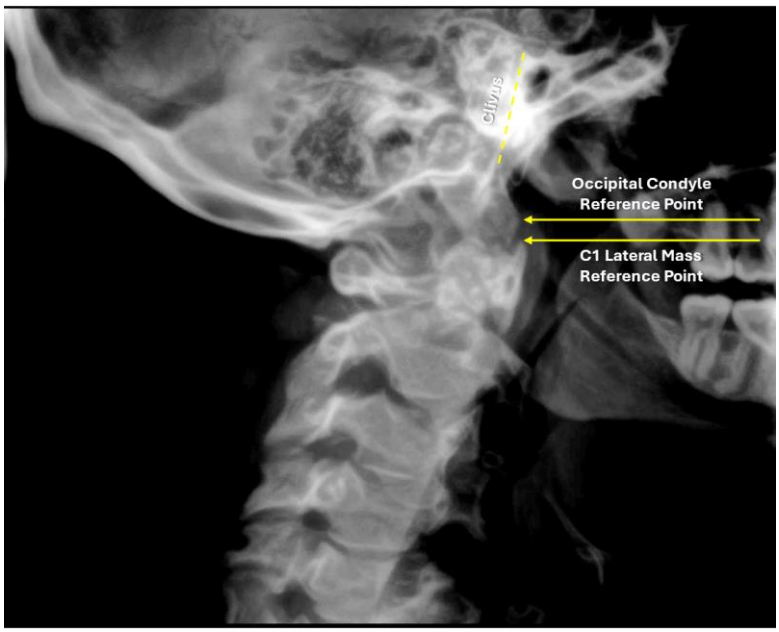


Figure 5. KCSC Rotation View, Left
Axis Analysis

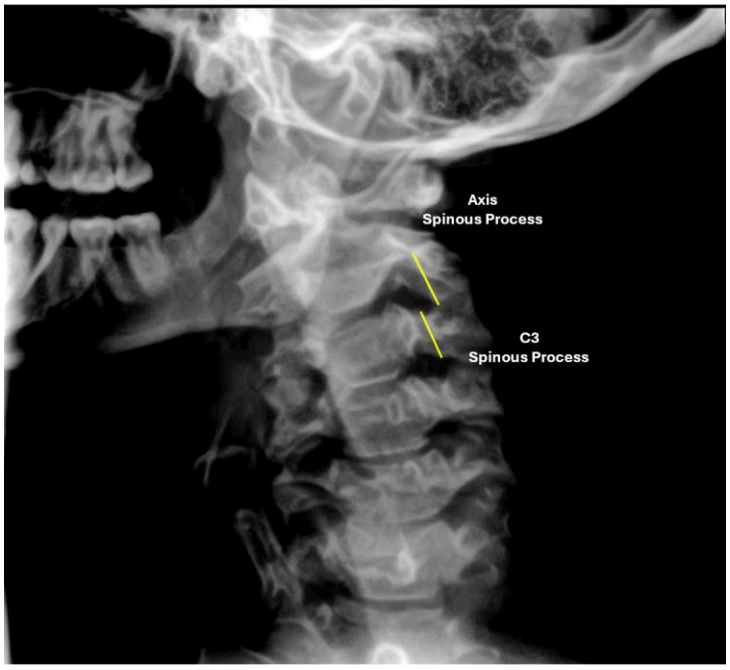
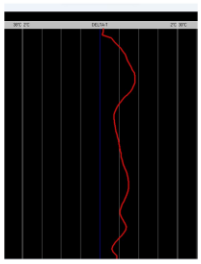
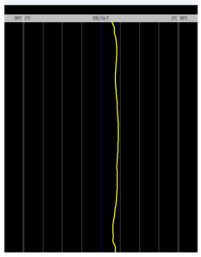


Figure 5. KCSC Rotation View, Right
Axis Analysis

Figure 6. Clear

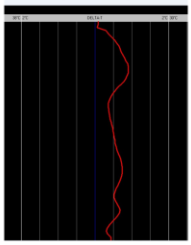


Patient Established Pattern

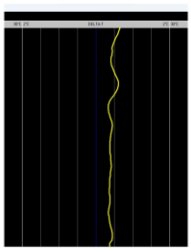


Clear

Figure 7. Improved

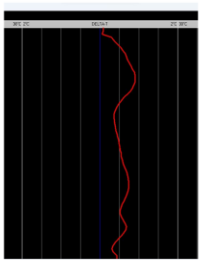


Patient Established Pattern

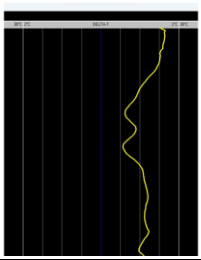


Improved

Figure 8. Rough

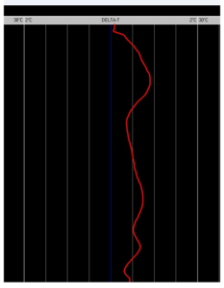


Patient Established Pattern

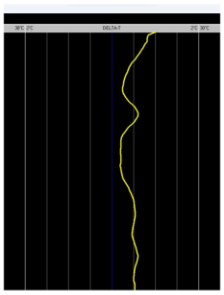


Rough

Figure 9. Adaptive

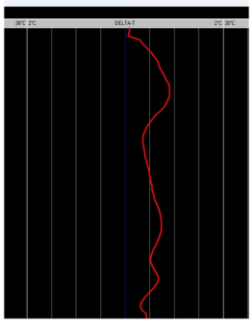


Patient Established Pattern

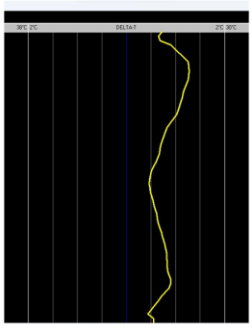


Adaptive

Figure 10. Pattern



Patient Established Pattern



Pattern

Figure 11. Doctor/Patient Position

Figure 12. Palpate Contact Point

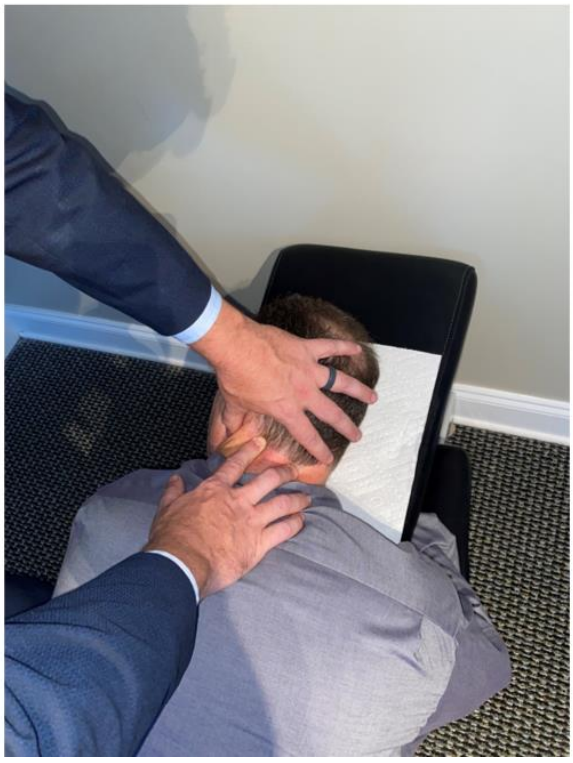


Figure 13. Tissue Pull

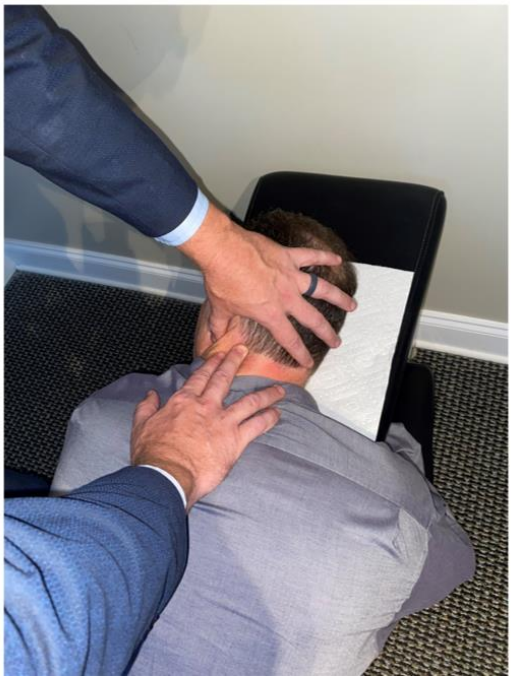


Figure 14. Apply Nail Hand

Figure 15. Apply Hammer Hand